University of
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SAFETY LEADERSHIP AND ITS RELATIONSHIP WITH SAFETY PERFORMANCE: A CASE STUDY OF AN AUSTRALIAN FACILITY MANAGEMENT COMPANY

A Thesis submitted by

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BAppSc(AppChem), MBus, MOHS

For the Award of

Doctor of Professional Studies

2022

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ACKNOWLEDGEMENT OF FIRST PEOPLES

I respectfully acknowledge the *Woiwurrung* and *Boonwurrung* people of the *Kulin Nation* in Melbourne and the *Giabal* and *Jarowai* peoples of the Toowoomba region, where the members of these communities and their Ancestors have and always will be guardians and custodians of the unceded lands where I work, live and study.

For thousands of years, they have performed ancient ceremonies, celebrations, initiations, and renewals on these lands. The story and spirit of the First Peoples will always be written in this landscape.

I humbly acknowledge their living culture and unique role in the life of this country. Their ancestors have danced and sung the Creation stories, which proclaim the sacredness of the gift given by the Creator Spirit. I acknowledge their Elders' past, present, and emerging, and celebrate the deep relationship with the Creator Spirit their Ancestors have had for thousands of years.

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KEYWORDS

ANOVA; Authentic Leadership Inventory; EFA; facility management; health, safety and wellbeing; negative binomial; NOSACQ-50; occupational injuries; professional studies; safety climate; safety compliance; safety leadership; safety participation; safety performance; thematic analysis; work-based learning; work-based research

ABSTRACT

Despite over 100 years of health, safety and wellbeing (HSWB) practice and research, too many incidents and injuries are still occurring in workplaces, resulting in fatalities and life-changing injuries and illnesses. HSWB research traditionally focuses on high-risk settings, such as mining, oil and gas, and construction, creating a gap in the literature for lower-risk environments such as the facility management industry within the Australian context. Furthermore, there is an identified gap in the literature around the impact of specific safety leadership theories on improving safety performance.

The purpose of this work-based study is to implement a project and conduct research that investigates a case indicative of the research problem: where there is no measure of safety leadership prioritisation, in relation to its stated commitment to increased safety prioritisation impact within the workforce and no understanding of the organisation's needs. Further, based on the study findings, it seeks to address the gap in the extant literature related to the phenomenon.

This research aims to explain the nature of the possible relationship between Safety Leadership, through a lens of Authentic Leadership, and Safety Performance within the workplace. The current state of knowledge on safety leadership and safety performance identified in the literature review underpins the questions which aim to address the practice-based research project assessing the relationship between Authentic Leadership and Safety Performance.

To address the aims of this study, the study sought to answer two research questions: 1) What is the relationship between Authentic Leadership, Safety Climate and Safety Performance within an Australian Facility Management Company? and 2) What are the respondents' perceptions of change to Authentic Leadership, Safety Climate and Safety Performance attributed to the Leadership, After-Action Review and Learning Team interventions of an Australian Facility Management Company?

The study adopted an explanatory mixed-method within a Type 2 embedded, single-case study design over two phases. Phase one included the quantitative data

collection consisting of two independent survey instruments, the Nordic Occupational Safety Climate Questionnaire (NOSACQ-50) and Authentic Leadership Inventory (ALI), and organisational safety performance data either side of the Project Intervention. Phase two of the study contains the Qualitative Data Collection and Analysis, through focus groups and key stakeholder interviews.

The results confirmed statistically significant correlational relationships between the ALI and NOSACQ-50 instruments within the Company, suggesting that a relationship exists between Authentic Leadership and Safety Climate. No statistically significant correlational relationships were observed between the mean ALI and NOSACQ-50 scores and the workgroup's safety performance metrics. This indicates that there is no relationship between Authentic Leadership and Safety Climate and the Company's Safety Performance. However, there is a statistically significant predictor effect observed in the negative binomial regression analysis between the Authentic Leadership and Safety Climate scores and several safety performance metrics. This suggests that there is a relationship between Authentic Leadership and Safety Climate and a selection of safety performance metrics measured by the Company. This finding is supported by the qualitative thematic analysis, which found that 'Authentically Leading Safety' led to 'Empowered & Engaged Teams' and 'Safe Operational Outcomes'. Respondent's had mixed perceptions on the changes observed within the Company as a result of the Project Interventions, with only the Leadership Intervention identified as having a positive impact on Authentic Leadership, Safety Climate and Safety Performance.

The contributions of this study provide a 'triple dividend' contribution. Firstly, professional practice has been advanced by increasing safety leadership capabilities and improving safe operational outcomes within the Company. Secondly, contributions to the knowledge of theory and the profession's body of knowledge were made through demonstrating the utility of the ALI and NOSACQ-50 instruments within novel settings, further expanding HSWB research beyond the high-risk context. Thirdly, the researcher developed professionally, in line with their doctoral learning objectives A number of limitations of the study are noted and lines of enquiry for future research are articulated.

CERTIFICATION OF THESIS

I, Timothy Allan Allred, certify that this Thesis is entirely my work, except where otherwise acknowledged. The work is original and has not previously been submitted for any other award, except where acknowledged.

Doctoral Candidate: Timothy Allan Allred

Principal Supervisor: Dr Luke van der Laan

Associate Supervisor: Dr Lee Fergusson

Student and supervisor's signatures of endorsement are held at the University.

DEDICATION

For Tobias, Owen and Molly —
May you be blessed with a sense of curiosity,
adventure, perseverance, and a love of learning
as you discover your passions in life.

ACKNOWLEDGEMENTS

I am able to do all things through Him who strengthens me.

Philippians 4:13 (CSB)

Completing this doctorate is not the end of my learning but a spark of continued curiosity about people, my practice and my passion for lifelong learning. I am eternally grateful to all those who have supported, encouraged, and challenged me throughout this research project and got this thesis to completion. It would be too difficult to name every person who has played a part in my doctoral journey. I want to acknowledge several who have journeyed with me through this research project, which has been incubating since 2012.

I was privileged to undertake my candidature under the valuable supervision of Associate Professor Luke van der Laan and Dr Lee Ferguson within the UniSQ Professional Studies Program. I sincerely thank you for your guidance, wisdom, care, and friendship throughout my candidature. You have kept me focused and motivated and have shown outstanding dedication and commitment to me through your supervisory roles. Thank you for your authentic care and empathy and the encouraging cricket bats.

Thanks to the Graduate Research School, the Faculty of Business, Education, Law and Arts, and specifically the Professional Studies team within the School of Education, including Professor Patrick Danaher, Associate Professor Marcus Harmes, Professor Karen Trimmer and Dr Sophia Imran. I have completed this research with the Australian Government Research Training Program (RTP) Scholarship and acknowledge this support.

My deepest gratitude and thanks go to the management and staff of Programmed Facility Management (PFM) for the opportunity to undertake this research project during my time as Regional HSEQ Manager. In particular, I would like to thank Greg Fogarty for his encouragement to undertake such as substantial project within the HSEQ team. Nathaniel Hickcox for his support throughout the project and his executive sponsorship of this practice-based approach to research, along with the various Contract, Operations and Facility Managers across the region who honoured me with their support through

the work-based project and demonstrated genuine care for the health, safety, and wellbeing of their teams.

To my fellow cohort of the UniSQ Professional Studies Program, thank you for the opportunity to learn from you and share this experience with you. While our research projects have each taken their paths, I have been encouraged by your insights, feedback, and seeing your passion and the great work you are doing in your fields of practice.

There is power in networks. I have had the opportunity to collaborate with, learn from, and be supported by many people. In particular, I would like to acknowledge: Peter Alsop, Richard Aitken, Clinton Avenell, Andrew Barrett, Ed Boucaut, Craig Brown, Nick Carrazzo, Noeleen Carey, Alex Crane, Steve Cuce, Milly Cuff, Renee Dellar, Matt DeSalvo, Peter Doody, Luke Eaton, Reuben Fryer, Brenton Harrison, Kelvin Hay, Dr David Janssen, Kevin Jones, Naomi Kemp, Michelle Oberg, Diana McDonald, Dr Cameron Palmer, Rachael Perry, Dr David Provan, Kaye Reid, Nir Schillinger, Elissa Scott, Melody Steele, Heather Teo, John Walsh, Leanne Wardle, Beverley Watts, David Wilkins, and Chris Yeats.

In this digital age, we can be mentored and 'taught' by people beyond our normal physical boundaries, many of whom we may never meet. I have been privileged to consume content from people whose knowledge and insights I have found encouragement and inspiration. So, I send a virtual 'tip of the hat' to Professor Tara Brabazon, Professor Brené Brown, Dr Todd Conklin, Dr Jason Fox, Ryan Hawk, Dr Amantha Imber, Dr Drew Rae, and Dr Dave Stachowiak.

This journey has been somewhat of a selfish endeavour, and I am indebted to my family's love, patience, and support. Thank you to my parents, Brent and Glenda, for sharing your zest for life and learning and encouraging my curiosity. To my wife, Yvonne, thank you for your understanding, patience, and sacrifice as I tried (sometimes successfully) to juggle too much work, study, and life commitments. Your friendship and love have been a solid grounding through intense research and focus periods. To my children, Tobias, Owen, and Molly – thank you for giving me the gift of play and the simple pleasures in life, which have provided refreshment and the energy to continue. Thank you for your continued love and smiles, even when I have been distracted with work and studies.

PAPERS AND PRESENTATIONS

The following papers have been published while undertaking this doctoral program.

- Fergusson, L., Allred, T., Dux, T., & Muianga, H. (2018). Work-based learning and research for mid-career professionals: Two project examples from Australia. *Interdisciplinary Journal of eSkills and Lifelong Learning*, 14, 19-40.
- Fergusson, L., Allred, T., & Dux, T. (2018). Work-based learning and research for mid-career professionals: Professional studies in Australia. *Interdisciplinary Journal of eSkills and Lifelong Learning*, 14, 1-17.

The following conference presentations have been delivered throughout this doctoral program, with the Presenter underlined.

- Allred, T. (2019). *Safety leadership and its impact on performance - a work-based project*. Paper presented at the National Health & Safety Conference. Safety Institute of Australia. 22-23 May 2019. Sydney, Australia.
- Fergusson, L., Allred, T. & Dux, T. (2017). *Workplace learning and research for mid-career professionals: two Australian case studies*. Paper presented at the Re-imagining Education for Democracy Summit. University of Southern Queensland. 13-15 November 2017. Springfield, Australia.

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

AAR	After-Action Review
ALI	Authentic Leadership Inventory
Com_	Safety Performance Metric – Compliance
Com_Hazard	Hazards Reported
Com_Inc	Incidents Reported
Com_NM	Near Misses Reported
Com_WSR	Worksite Reviews Completed
DPRS	Doctor of Professional Studies Research Program
HSWB	Health, Safety and Wellbeing
Inj_	Safety Performance Metric – Occupational Injuries
Inj_All	All Injuries
Inj_TRI	Total Recordable Injuries
KMO	Kaiser-Meyer-Olkin
LTI	Lost Time Injury
LTIFR	Lost Time Injury Frequency Rate
ML	Maximum Likelihood
MTI	Medical Treatment Injury
NOSACQ-50	Nordic Occupational Safety Climate Questionnaire
Par_	Safety Performance Metric – Participation
Par_HAZC	Hazard Contributors
Par_SC	Safety Conversations Recorded
Par_SCC	Safety Conversation Contributors
Par_WSRC	Worksite Review Contributors
TRIFR	Total Recordable Injury Frequency Rate
UniSQ	University of Southern Queensland
WSR	Worksite Review

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CHAPTER 1 INTRODUCTION

1.1 INTRODUCTION

The researcher is a Certified Chartered Generalist OHS Professional with 15 years' experience in the field. The researcher is a practising Heath, Safety and Wellbeing (HSWB) professional within an Australian Facility Management Company (the Company), a leading provider of facility maintenance and asset management solutions for clients across various government and private sector industries, including education, utilities, social housing, corrections, and aviation.

The researcher sees their continuous increase of knowledge and learning as a personal investment in themselves and their career. This has been a well-considered process since completing their undergraduate degree and entering the workforce. The researcher's professional learning and development process has been an ongoing journey, one that has been formal, informal and non-formal, and they genuinely look to live a life of lifelong learning.

Despite the 100-plus years of HSWB practice and research, Hofmann, Burke and Zohar (2017, p. 384) noted that "[a]lthough much progress has been made, there are still too many workplace injuries, fatalities and occurrences of occupational disease". Borys, Else and Leggett (2009) argue that the workplace health, safety and wellbeing profession has shifted through five stages or 'ages' and now moving from a 'technical age' into the 'adaptive age', which transcends all the ages of safety, and one which requires an adaptive approach to health, safety and wellbeing to benefit the organisation in a volatile, uncertain, complex and adaptive (VUCA) world.

The HSWB profession is a complex and multidisciplinary field of practice. The field of practice comprises lawyers, chemists, psychologists, educators, physicians, and risk practitioners, evidence of the HWSB professional roles adapting over time (Borys et al. 2009). In this VUCA world and society, Dekker supports the move of HSWB into the adaptive age, arguing that safety needs to be done differently. HSWB professionals, and organisations more broadly, need to "adapt to better cope with

the complexity of the world facing us" (Dekker 2015, p. xi), not relying on past safety achievements as a guarantee of future performance. As such, a fundamental premise of this study is that different perspectives in the research of HSWB are needed to represent knowledge that is not derived from traditional research paradigms. A work-based learning and research doctoral enquiry may provide such an alternative perspective in responding to Dekker's call.

Safety research typically focuses on "organizations operating in high hazard settings" (Pilbeam, Doherty, Davidson & Denyer 2016, p. 119). This includes industries such as mining, construction and oil and gas. This has created a limited sample within the literature not representative of all industry sectors, including facility management within the Australian context. Further, there is a gap in the literature around the impact of specific safety leadership theories on improving safety performance (Mullen, Kelloway & Teed 2017).

Hon, Chan and Yam (2014) highlighted the importance of facility management works as an often-overlooked industry. They found that safety practices within the facility management sector varied quite differently from those in construction works. They are generally found in occupied buildings; they frequently work in large numbers of small groups across dispersed geography, making supervision and management of HSWB difficult.

Improved safety performance has a symbiotic relationship with work quality through the impact that unplanned events (e.g., events that cause injury, illness, damage, or loss) have on costs, delivery schedule, and customer disruption (Love, Teo, Morrison & Grove 2016). Gahan (2015) asserts that when an organisation gets its work health and safety right, its workplace culture is more robust and adaptive, leading to greater resilience, continuous improvement and better organisational performance. Studies on an organisation's or workgroup's safety climate have provided limited evidence of associations with reduced accidents or injuries at work, and Leitão and Greiner (2015) recommend there is a need for further intervention studies to be undertaken. This study included the investigation of three types of such interventions and their intervening effect on safety performance.

The Company has a Zero Harm statement of intent and an underlying belief that all injuries are preventable. This is underpinned by two core values of ‘personal safety leadership’ and ‘care & empathy’; however, there is no understanding of how these values are operationalised and how they are measured within the organisation beyond injury rates.

Safety leadership is highlighted as a value of the Company; however, there is no measure of safety leadership prioritisation or impact within the workforce and no understanding of the organisation's needs to improve safety performance. Safety leadership needs to be embraced and prioritised throughout an organisation to foster a positive safety climate and improve safety performance (Biggs, Dingsdag & Roos 2008). The relationship between safety leadership, safety climate, and safety performance has been identified as requiring further research (O'Dea & Flin 2001). The researcher seeks to apply an evidence-based approach to improve safety performance within their professional practice.

Given the problem identified in the context of the Company, a preliminary investigation of the literature indicated that this phenomenon is under-researched, suggesting a potential gap in the literature that is reflective of the problem identified in practice, particularly in the often-overlooked facility management industry (Hon et al. 2014).

Given the above, the following key premises of the study inform its line of enquiry:

1. The company's safety performance is understood in terms of zero injuries as informed by a Zero Harm statement of intent and is not captured in terms of other available indicators.
2. The needs and engagement of the company's workers in relation to HSWB can be adequately described in terms of the notion of ‘safety climate’ and its dimensions.
3. The company’s stated core values of ‘personal safety leadership’ and ‘care & empathy’ suggest an ‘authentic leadership’ perspective of safety leadership.

Based on the study's key premises, other indicators for measuring safety performance, such as safety participation and safety compliance (Griffin & Neal 2000), were examined and informed the development of safety performance measures adopted by the study.

Safety climate is described as the prevailing safety attitude or perceptions within the organisation (Guldenmund 2000), has been linked to reflecting worker engagement (Clarke & Ward 2006) and the extent to which safety is prioritised (Guediri & Griffin 2016). Further safety climate is recognised as an indicator of safety performance (Wu, T.-C., Chen & Li 2008).

Company statements of its core values has increased in public-facing communications. Importantly, they are also an indication to employees of what values the company is committed to. In the case of this study, the Company publicly states that 'personal safety leadership' and 'care & empathy' as core values underpinning their Zero Harm statement of intent. From a safety leadership perspective, the stated values suggest leadership paradigms that are values-based, self-aware and relational. The authentic leadership theory includes these characteristics and is adopted by the study.

1.2 PURPOSE

The purpose of this work-based study was to implement a project and conduct research that investigates a case indicative of the research problem: where safety leadership is highlighted as a value of the Company; however, there is no measure of safety leadership prioritisation or impact within the workforce and no understanding of the organisation's needs to improve safety performance, beyond injury rates. Further, based on the study findings, it sought to address the gap in the extant literature related to the phenomenon. That said, the study focused on its potential contribution to practice by undertaking the case study through work-based research. Completing this higher degree research through the DPRS program provides the additional benefit of professional development, work-based learning opportunities, and the advancement of the practitioner-researcher approach to lifelong learning.

In terms of the case study, the Company is a leading provider of facility maintenance and asset management solutions for clients across various government and private sector industries, including education, utilities, social housing, corrections and aviation. In order to reduce the scope of the work-based research, several delimitations are imposed. The current work-based research is limited to the Victorian/Tasmanian operations of an Australian Facility Management Company rather than the facility management industry at large, reducing the project's scope to focus on a single case within the broader industry context.

This study aims to:

1. Provide a holistic, evidence-based explanation of the organisational context where safety is prioritised by the interaction between leadership, climate, and performance measures are unknown.
2. Comprehensively review the extant literature and knowledge related to safety in facility management contexts, overarching theories, and research reporting on similar phenomena and concept models.
3. Investigate the nature of the relationship, if any, between Authentic Leadership, Safety Climate and Safety Performance within the context of a facility management company as a case study.
4. Implement an HSWB project intervention in a facility management company to establish an indicative evidence base for the intervening effect of such interventions.
5. Provide an evidence-based insight into the dynamics of leadership prioritisation of safety in organisations.
6. Achieve the work-based learning pedagogical outcomes of measurable contributions to practice (the organisation), practitioners, disciplinary knowledgebase, and the personal and professional development of the practitioner-researcher.

In order to achieve the aims, the scope of this study includes:

- Conduct a literature review to understand the research problem and identify gaps in the available research.
- Design a mixed-method research approach to apply within the case study.
- Measure the worker's perceptions of authentic leadership and safety climate within an Australian Facility Management Company.
- Design and conduct a work-based project focusing on safety leadership and safety performance.

1.3 WORK-BASED RESEARCH

The study recognises the importance of evidence-based practice and the continual professional development of the researcher. This led the researcher to seek a postgraduate research degree to deepen his education and research capabilities in the field of health, safety, and well-being (HSWB). The current thesis results from work-based research undertaken as a practitioner-researcher in the DPRS program at the University of Southern Queensland (UniSQ).

Formal, informal and non-formal learning (Benozzo & Colley 2012) has made up the researcher's own professional learning and development journey. The researcher was drawn to the DPRS program because of its unique approach focusing on work-based research in practice – applying doctoral-level enquiry and rigour to workplace issues and projects.

Work-based research is not unlike other approaches to gaining knowledge when applying the scientific method; it still represents the systematic study of phenomena and materials in order to answer questions, establish facts, and draw new conclusions (Fergusson, Shallies & Meijer 2019a). Unlike research environments, however, in which variables can be controlled and tested in order to make reliable and definitive statements, workplace research is usually conducted in complex, "messy" (O'Leary & Hunt 2016, p. 10; Fergusson 2019) work and organisational environments.

Undertaking research within or arising directly from work-based problems generates work-based learning opportunities (Lester & Costley 2010). Relevant pedagogies support the emerging field of practice and study of work-based learning, which has theoretical foundations based on Dewey's theory of experiential and social learning (Lester & Costley 2010). The focus of work-based learning is both about what is learned and how best we learn through applying a work-based learning pedagogy and "authentic learning facilitated through professional reflective practice" (van der Laan & Neary 2015, p. 265). Reflective practice encourages practitioners to interrogate their professional practice, identify the development and emergence of knowledge, and demonstrate their own professional capabilities (Doncaster & Thorne 2000). For these and other reasons, it forms a central part of the Doctor of Professional Studies (DPRS) program (Fergusson, van der Laan & Baker 2019b; Fergusson, van der Laan, Ormsby & Azmy 2020).

1.4 JUSTIFICATION OF THE RESEARCH

This work-based research project aimed to better understand the effectiveness of safety leadership within the Company and develop a tangible framework for leaders to work within to have a positive impact on the safety climate and safety performance. Undertaking the work-based research project was identified as being important to the researcher. While facility management may not traditionally be seen as a high-hazard industry (where safety research is typically undertaken (Pilbeam et al. 2016)), many of the hazards associated with the operations, maintenance and repair activities undertaken by their workers are considered high risk. This research responds to the importance of undertaking research in often-overlooked industries (Hon et al. 2014).

While research studies on safety leadership are not new, "[t]here remains a need for safety leadership intervention studies to assess the impact of specific safety leadership behavior" (Mullen et al. 2017, p. 41) to determine whether interventions improve safety leadership and the impact this has on leader's behaviours, safety compliance and safety participation within the workforce. Authentic leadership has been associated with improved safety performance (Cavazotte, Duarte & Gobbo 2013); however, further application of this in different contexts is important. Pilbeam

et al. (2016, p. 120) add that further "[o]bservations of individual leader practices in the workplace would give greater insight into actual practice and their contingent relationships on context and employee engagement."

Hofmann et al. (2017) note a lack of research focusing on safety climate and culture, drawing on high-reliability organisations and resilience engineering. This gap in the literature is an opportunity for further research, where safety climate integrates with a focus on safety issues and overall safety performance.

This current study explored whether safety leadership, through the lens of authentic leadership, impact safety performance. The study sought to explain the nature of the possible relationship between authentic leadership and safety performance, with the aim of investigating the relationship between Authentic Leadership, Safety Climate and Safety Performance within an Australian Facility Management Company.

1.5 ANTICIPATED CONTRIBUTIONS

The evidence-based approach practice provides opportunities for skill adoption and adaptive learning (Nilsen, Neher, Ellström & Gardner 2017), with the DPRS providing the researcher with the opportunity to undertake work-based research that values a research study's broader contribution. The researcher selected the DPRS higher degree program due to the program's focus on contributing to professional practice, theory, and the practitioner-researcher. It is anticipated that completing the study will contribute to professional practice, knowledge of theory and the practitioner-researcher.

Professional Practice

- Provide safety leadership, safety climate and safety performance insights to an Australian Facility Management Company.
- Provide insights to similar practitioners that practice HSBW and organisations that reflect the research problem.
- Support the safety leadership capabilities of the leaders across the region's workgroups through a safety leadership workshop.
- Improve safety performance and learning through the introduction of after-action reviews.

- Conduct a series of learning teams to close the gap between work-as-imagined and work-as-done.

Knowledge

- Work-based research conducted within an Australian facility management company expanding the current knowledge of health and safety.
- Enhanced understanding and knowledge of safety leadership and safety performance.
- A thesis contributing to the academic environment.
- Contribute to the profession's body of knowledge through articles and conference presentations.
- Improve safety performance and learning through the introduction of after-action reviews.

Practitioner-Researcher

- Critically evaluate research studies associated with safety leadership and safety climate to assess their quality and applicability in improving safety performance and reporting the evidence in a doctoral dissertation.
- Demonstrate expertise through practical communication skills, including internal and external presentations and articles for publication.
- Develop a research methodology to evaluate the relationship between authentic leadership and safety performance.
- Develop and implement a work-based project focusing on safety leadership capabilities, improving safe operational outcomes of an Australian Facility Management Company.
- Contribute to the health and safety profession's body of knowledge by completing a doctoral dissertation on the relationship between safety leadership and safety performance.

1.6 STRUCTURE OF THE THESIS

This thesis begins by providing a background to the study into the relationship between safety leadership and safety performance. It follows a format of six chapters, followed by references and appendices. Each chapter is laid out according to the UniSQ higher degree by research thesis presentation schedule.

This chapter provides an overview of the thesis. It describes the background and context, and purpose of the research. The research problem is defined, as well as the work-based approach to undertake this research. The justification for the research is then presented, followed by the anticipated contributions from undertaking the work-based research. Chapter 2 is based on a review of the safety leadership, safety climate and safety performance literature. The theories and definitions for each are reported, together with the linkage between the three concepts as they apply to the context of an Australian Facility Management Company. The conceptual framework is developed from the literature review findings, with the research questions and case study propositions reported.

Based on the literature review and resulting conceptual model, the research design and methodology are presented in Chapter 3, providing the rationale for the research design, the method for selecting the sample, the data collection strategy and data analysis techniques. The quantitative data collected is then presented, analysed and examined in Chapter 4. The qualitative data collected is then presented, analysed and examined in Chapter 5.

The thesis culminates in Chapter 6 by outlining the conclusions related to the research problem, answering the research questions and evaluating the case study propositions. The contribution to professional practice, knowledge and the researcher-practitioner as deduced from the research outcomes is then discussed. Chapter 6 concludes by reporting the limitations of the study and recommendations for future research. Figure 1.1 provides the overall structure of the thesis based on the methodology employed.

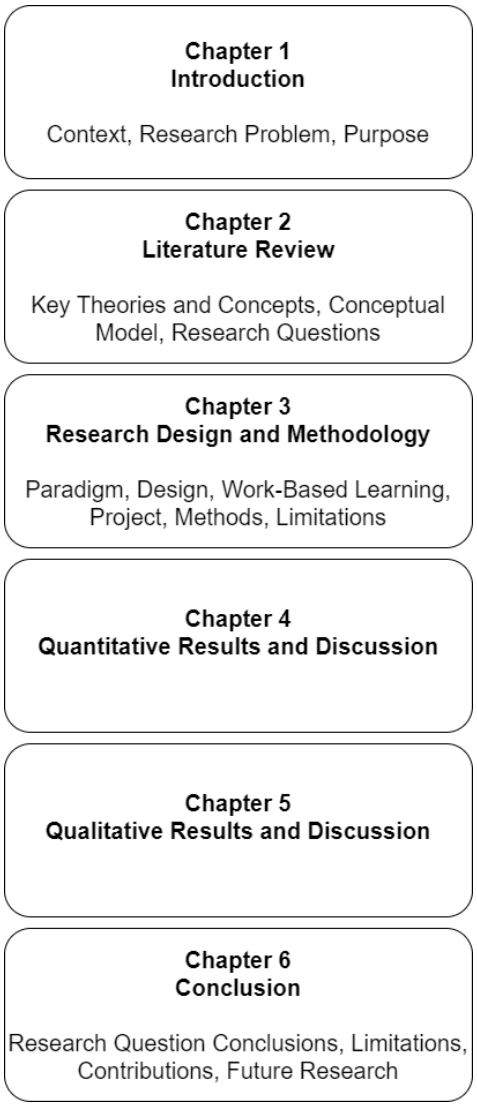

Figure 1.1 Structure of the Thesis

1.7 CONCLUSION

Chapter 1 provided an overview of this research project, including the context and purpose of the research. The research problem is defined, as well as the work-based approach to undertake this research. The justification for the research was presented, followed by the anticipated contributions from undertaking the work-based research. Chapter 2 will review the literature on safety leadership, safety climate, and safety performance. The theories and definitions for each are reported, together with the linkage between the three concepts as they apply to the context of an Australian Facility Management Company. The conceptual framework is developed from the literature review findings, with the research questions and case study propositions reported.

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CHAPTER 2 LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter provided an introduction to the thesis and an overview of the current study, including a summary of the significance of the research and the contribution of practice, theory, and the researcher. The first chapter provided an overview and outline of the thesis that will now be explored in greater depth.

This chapter of the thesis will review the literature to help inform the work-based research project of the Professional Studies doctoral program focusing on Safety Leadership and its relationship with Safety Performance within an Australian Facility Management Company, as shown in Table 2.1.

Table 2.1 Structure of Chapter 2

Section	Content	
2.1	Context of the Research	Facility Management Health, Safety and Wellbeing in Australia Theoretical Approach to the Research
2.2	Safety Leadership	Background Theories Definition of Safety Leadership Dimensions of Authentic Leadership Authentic Leadership Inventory Safety Leadership and the Linkage to Safety Climate
2.3	Safety Climate	Background Theories Definition of Safety Climate Dimensions of Safety Climate NOSACQ-50 Safety Climate Questionnaire Safety Climate and the Linkage to Safety Performance
2.4	Safety Performance	Background Theories Definition of Safety Performance Safety Compliance, Safety Participation and Occupational Injuries Influences on Safety Performance
2.5	Conceptual Model	
2.6	Research Questions	
2.7	Propositions	
2.8	Conclusions	

This literature review explains the relevant theories to be considered within the fields of safety leadership, safety climate and safety performance. The literature

discussed includes relevant Australian and International research to understand the topic of the research project. Previous research will be examined to gain more significant insights into these respective constructs.

The chapter begins by setting the context for which the research is being conducted. The second section of the literature review, safety leadership, will consider what safety leadership is in the broader context of leadership theory. It will also explore various approaches to leadership found in the literature, focusing on authenticity, before demonstrating the link between safety leadership and safety climate.

The third section of the literature review will introduce the concept of safety climate. Various theories of safety climate will be explored before demonstrating the link between safety climate and safety performance. The fourth section of the literature review will explore the relationship between safety climate and safety performance before exploring and defining key safety performance measures in the literature.

Finally, the current study will propose a conceptual model, research questions, and propositions for the study.

2.2 CONTEXT OF THE RESEARCH

2.2.1 Facility Management

This work-based research project was undertaken within an Australian Facility Management Company. The International Facility Management Association defines facility management as "a profession that encompasses multiple disciplines to ensure functionality of the built environment by integrating people, place, process and technology" (Atkin & Brooks 2015, p. 5). Facility management supports an organisation's core business by delivering building maintenance, engineering, and asset management services and often includes business support functions such as cleaning and reception management.

Facility management is a complex industry (Elmualim, Shockley, Valle, Ludlow & Shah 2010) and considered by some authors as 'a jack of all trades' (Tay & Ooi 2001), which covers cleaning, repairs and maintenance, people and property

management, HSWB, and contractor management. Increasingly facility management has also included minor building works, utility supply (Atkin & Brooks 2015), and environmental sustainability (Elmualim et al. 2010). According to the Industrial Classifications guide of the Australian Bureau of Statistics, facility management services as split between Constructions Services (Building Structure Services, Building Installation Services, Building Completion Services), Architectural, Engineering and Technical Services (Engineering Services), and Administrative and Support Services (Building Cleaning, Pest Control and Gardening Services) (ABS 2006).

Facility management should not be considered as "just another construction-related service" (Atkin & Bildsten 2017, p. 118) but rather as maximising the performance and value of the operations of the asset with a whole of lifecycle perspective. When executed well, facility management should "reduce building maintenance costs and improve the [user's] health, safety and satisfaction" (Horner, El-Haram & Munns 1997, p. 280). However, while the facility management industry is growing around the world, "literature discussing the safety of [facility management] works remains scarce" (Hon, Chan & Yam 2013, p. 519).

Hon et al. (2014) highlighted the importance of facility management works (referred to by the authors as Repair, Maintenance, Minor Alteration, and Addition works) as an often-overlooked industry. They found that safety practices within the facility management sector varied quite differently from those in construction works. They are generally found in occupied buildings; they frequently work in large numbers of small groups across dispersed geography, making supervision and management of HSWB difficult.

Asset repairs and renewals, and minor alterations and remodelling of facilities, poses the risk of falls from height, electric shock, exposure to hazardous chemicals, contact with machinery, manual handling and lacerations, with unsafe work practices and behaviours attributed as the key cause of workplace accidents and injuries (Hon et al. 2013). While facility management may not traditionally be seen as a high-hazard industry, many of the hazards associated with the operations, maintenance and repair activities undertaken by their workers are considered high risk. Research by Tymvios, Mayo and Smithwick (2020) detailed the top hazards as identified by facility

management personnel as (1) Electrical, (2) Falls, (3) Chemical/biological hazards, (4) Moving objects, and (5) Mechanical systems.

With a wide-ranging supplier and contractor base across various trades and services, one study of facility management contractors found their employees to have low priority of safety management practices, adversely impacting the company's overall safety performance (Jaafar, Choong & Mohamed 2017). Outsourcing specialised or non-core facility management activities to increase the quality of work performed and reduce costs (Rethaa van der & Onojaefe 2019) increases the need to ensure the contractor's safety priority aligns with that of the organisation.

2.2.2 Health, Safety and Wellbeing in Australia

The HSWB profession is a complex and multidisciplinary field of practice. Unlike many other professions, say accounting or real estate, the HSWB profession (also referred to as Occupational Health and Safety or OHS) is not as highly regulated. There are no defined requirements from an educational or experience perspective for employment as an HSWB professional (AIHS 2019a). The field of practice comprises lawyers, chemists, psychologists, educators, physicians, and risk practitioners. The role of the HSWB professional has changed over time since its origins dating back as far as 1837 and continues it builds its own body of knowledge based on over 100 years of HSWB practice and research (Pryor 2019).

Despite 100-plus years of HSWB practice and research, Hofmann et al. (2017, p. 384) noted that "[a]lthough much progress has been made, there are still too many workplace injuries, fatalities and occurrences of occupational disease". Within Australia, for example, 3,936 workers have been fatally injured while working between 2003 and 2019 (SWA 2020a).

In approaching this doctoral project, the researcher sees the problem of workplace injuries as an individual, organisational and societal issue with both financial and non-financial impacts. As presented in Table 2.2, society bears 17.6% of costs associated with injuries and illnesses, employers only 5%, whereas the injured worker bears most of these costs at 77.3%, or up to 84.7% for an illness or disease.

Table 2.2 Total and Average Cost of Work-Related Injuries by Cost Bearer (Australia 2012/13)

Cost Bearer	Injury		Disease		Total	
	Total Cost ($B)	*Per Incident*	*Total Cost ($B)*	*Per Incident*	*Total Cost ($B)*	*Per Incident*
Society	7.1	19,070	3.7	23,970	10.9	20,500
Employer	1.6	4,350	1.4	9,280	3.1	5,800
Worker	19.5	51,960	28.4	182,900	47.8	90,300
Total	**28.2**	**75,380**	**33.5**	**216,150**	**61.8**	**116,600**

Adapted from SWA (2021a)

Poor HSWB practices inevitably impact people going about their lives, doing an honest day's work for an honest day's pay. The personal cost to people may include injury, illness or a loss of life resulting in loss of income, livelihood or ongoing psychological trauma. At an organisational level, poor HSWB practices can reduce organisational productivity at best and result in prosecution at worse. Organisational safety performance is regularly reported in tender submissions and may impact the future pipeline of works if their performance continues in an unfavourable trajectory. From a broader societal view, poor HSWB practices impact the economy, impacting insurance schemes, reducing productivity, and increasing healthcare costs.

Individuals Impacts

Despite technological advances globally, workplace injuries, illnesses and fatalities are still common (Clarke & Taylor 2018). According to Safe Work Australia, 190 workers were killed in Australian workplaces in 2017 (Boland 2018). While there has been a 37.4% reduction from the 310 lives lost in 2007 to 194 lives lost in 2020, the reality is that these figures still translate to a worker fatality rate of 1.5 fatalities for every 100,000 workers (refer to Figure 2.1 for the annual trend of workplace fatalities and fatalities rates in Australia since 2003).

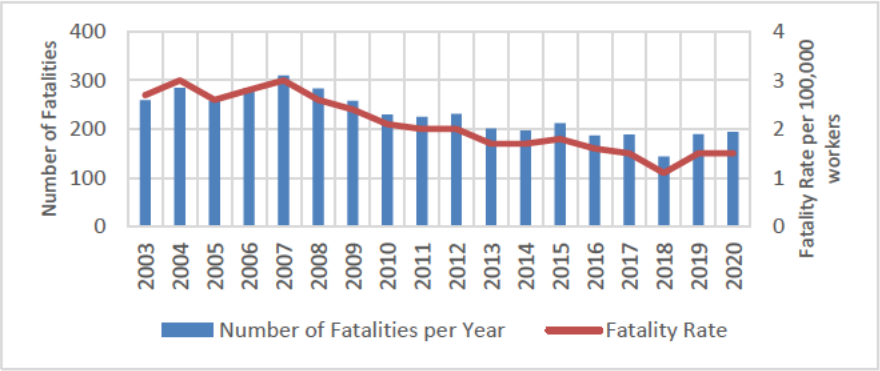

Figure 2.1 Australian Worker Fatalities and Fatality Rates (2003 – 2020)

Adapted from SWA (2021b))

Available date fails to provide granularity for the Facility Management sector within Australia warranting further investigation. The construction industry, however, has been identified as a priority industry by Safe Work Australia, due to the 154 worker fatalities in this sector over the five-year period from 2016-2020 (SWA 2021b). Within this industry division, Building Installation Services which consists of plumbing, electrical and HVAC services accounted for 15% of the sector's fatalities. Building Structure Services which consists of concreters, bricklayer and roofers contributed to 12% of the sector's fatalities, while carpentry, plastering and painting services (Building Completion Services) accounted for 8% of the sector's fatalities.

It should be noted that the work-related fatality data presented in Figure 2.1 exclude those fatalities which occur outside of the workplace; however, they may be attributed to workplace issues and stressors, such as those classified as suicides. An analysis of the Victorian Work-Related Fatality Database between July 2000 and December 2007 by Routley and Ozanne-Smith (2012) identified that 643 of the 3775 (17%) suicides in Victoria were classified as work-related. Of these 643 work-related suicides, 355 (55%) were primarily associated with work-related stressors.

Pfeffer (2018, p. 1) emphasises that workers no longer need "to work in a coal mine, on an oil rig, in a chemical plant, or in construction to face possibly toxic, health-destroying workplaces". While focusing many on United States examples, Pfeffer argues that while physical dangers at work have been largely well managed, stress at work worsens, resulting in an increasing toll of physical and psychological ill-health.

Furthermore, workplace injuries and illnesses can lead to loss of enjoyment of life (including reduced participation in recreational activities), relationship difficulties/breakdowns, and psychological ill-health. Increasingly, the impact that workplaces and work practices have on workers' physical and psychological health and wellbeing is gaining more attention as the prevalence and cost of mental health-related compensation claims increases compared to other serious claims[1].

[1] 'Serious' workers' compensation claims relate to those claims where the injury or illness has resulted in one or more weeks off work.

As presented in Figure 2.2, while there was a temporary reduction in serious compensation claims between 2014/15 and 2016/17, there has been a 3% increase in the total number of serious claims to 2018/19. However, mental health claims for compensation have increased by 45% over the same period, from 6,890 claims in 2013/14 to 10,015 claims in 2018/19 (SWA 2021c).

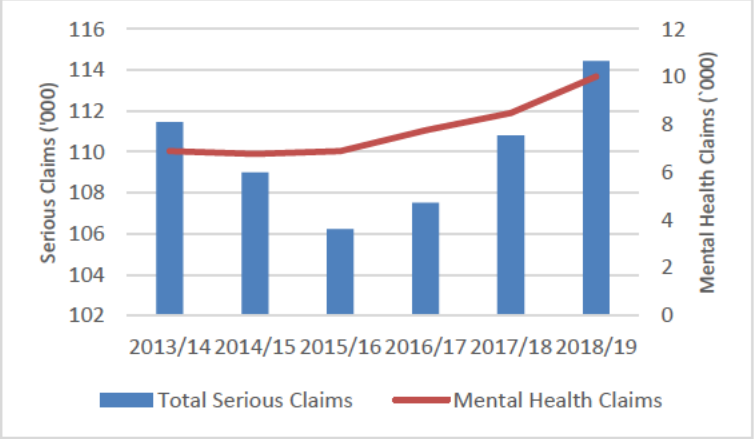

Figure 2.2 Trend of Mental Health Claims versus Total Serious Claims (2013/14 – 2018/19)
Adapted from SWA (2021c)

Stress affects an individual's wellbeing (both within and externally to work), with issues in the workplace being reported as the sixth most prevalent stressor by 32% of respondents in the 2015 Stress and Wellbeing in Australia survey conducted by the Australian Psychological Society (APS 2015). Issues in the workplace are preceded in prevalence by personal financial issues (45%), health issues (44%), family issues (43%), issues with maintaining a healthy lifestyle (39%) and issues with the health of others (37%). The Stress and Wellbeing report highlights concerning data the some of the "non-productive ways of managing stress such as 'smoking cigarettes' (18 per cent prevalence; 64 per cent effectiveness), 'gamble' (16 per cent prevalence; 47 per cent effectiveness) and 'take recreational drugs' (8 per cent prevalence; 67 per cent effectiveness)" (APS 2015, p. 17) received the highest rating of effectiveness from respondents. Alcohol consumption was also identified as a way of managing stress, with 40% prevalence and 49% reported effectiveness.

Fifty-one per cent of people reportedly did not seek help with their symptoms of depression, anxiety and distress, with those respondents with higher levels of depression, anxiety and distress more likely to engage in taking recreational drugs,

smoking, drinking alcohol, gambling, and playing video games to help manage their stress when compared to other Australians (APS 2015, p. 18).

In a meta-analysis of workplace stressors, studies in the US (focusing on job insecurity, long work hours, shift work, lack of support structure, work-family conflict and poor job control) found that "work stress is associated with a variety of negative health outcomes, including cardiovascular disease, clinical depression, and death" (Goh, Pfeffer & Zenios 2015, p. 45). Their general conclusion was that there was a strong association between workplace stressors and health, finding that there was a 90% increased risk of self-reported poor physical health where there was work-family conflict and a 50% increased risk of a medical diagnosis where there is perceived low organisational justice in the workplace. Pfeffer (2018) takes this line of enquiry further, exploring the effect that ten identified workplace exposures within the control of employers have on human health and longevity, ultimately arguing that "workplace environments in the United States may be responsible for 120,000-excess deaths per year" (Pfeffer 2018, p. 38).

Organisations Impacts

Notwithstanding the impact of injury and illness on people in their work, workplace incidents and injuries can negatively impact an organisation's performance, affecting costs, delivery schedules, and impacting its customers. Love et al. (2016) explored these impacts of incidents and injuries on construction projects and the rework required to resolve quality and safety-related issues. Productivity delays or production downtime, repairs to damaged plant and equipment, and poor customer service delivery may lead to reputational damage and potential loss of business.

The cost of managing injuries is not a consideration when preparing annual organisational budgets. However, these costs can be higher once the incident, investigation, damage, replacement, and productivity costs are aggregated. Table 2.3, below, provides a breakdown of the costs associated with the following example injury from the construction industry:

A worker was carrying out jackhammer works using a 70lb hammer. While hammering the wall, the point of the hammer has slipped off the wall and dropped down. The worker attempted to stop the hammer from falling and felt pain in his lower back. (WHSQ 2019)

Table 2.3 Cost of workplace injury

Activity and Costs to Consider	**Cost**
Incident Costs • Lost productivity of workers (affected directly or indirectly) • Lost productivity for employer	$1205
Investigation Costs • Time taken by your organisation to investigate the injury (e.g. interview, photographs) • Time taken to conduct follow up meetings to discuss the incident	$1235
Damage Costs • Time to assess damage to property, equipment or material • Clean up time (including co-ordination)	$160
Replacement Costs • Time taken to hire or relocate replacement worker • Time taken to train new, or relocated worker	$675
Productivity Costs • Lost productivity due to disruption and delay (e.g. waiting to resume) • Time spent managing the injury claim	$4815
Total Cost of the Incident	**$8090**

Adapted from WHSQ (2019)

The impact of poor HSWB performance can lead to reputational damage and unfavourable outcomes when bidding for new business. HSWB performance reporting is a standard for extensive tender processes across government and private sectors. This requires prospective tendering organisations to report their previous years' HSWB performance to demonstrate what level of risk they would pose to the client organisation. This HSWB performance reporting usually takes the form of disclosing the number of Lost Time Injuries (LTI), Medical Treatment Injuries (MTI), the Lost Time Injury Frequency Rate[2] (LTIFR) and Total Recordable Injury Frequency Rate[3] (TRIFR). HSWB performance may be seen as a key differentiator between tender respondents, especially where the overall cost of delivering services is higher than a competitor. Poor HSWB performance can lead to missed opportunities with

[2] LTIFR = ([Number of lost time injuries in the reporting period] x 1,000,000)
(Total hours worked in the reporting period)

[3] TRIFR uses the same formula as LTIFR, however includes the total number of medical treatment and lost time injuries in the reporting period.

potential clients due to the perceived risk of engaging an 'unsafe' subcontractor to perform works/services on behalf of the client.

Similarly, HSWB performance can impact the organisation's brand reputation with existing and potential clients. Where the client considers HSWB performance in reviewing the performance of the contract, poor HSWB performance associated with LTIFR and TRIFR can lead to termination of contract or renewal of contracts not being considered. This information can filter throughout the sector and dilute the organisation's brand reputation, impacting further opportunities with similar clients.

There is also a health and productivity impact on the organisation from poor HSWB performance. The average person spends 25-35% of their waking lives at work. The workplace is a significant part of an individual's life that affects their whole selves, at work, at home, and in the community (Harter, Schmidt & Keyes 2003). The organisational impact of worker wellbeing means employee engagement, which supports "keeping employees, satisfying customers, and [the organisation can continue to be] financially productive and profitable" (Harter et al. 2003, p. 16).

Zwetsloot and Pot (2004, p. 116) note there has been "an intensification of work", which has resulted in an increased reporting of health and wellbeing risks, including psychological distress, before arguing for the business value of improving the management of 'health' within HSWB. Purporting that good health is "a vital prerequisite for (labour) productivity, a vital condition of continuous learning…and essential for the company's innovative capacity" (Zwetsloot & Pot 2004, p. 118). Grawitch, Gottschalk and Munz (2006, p. 138) found that organisations that demonstrate a commitment and concern for their employees "benefit from reciprocal commitment by their employees", resulting in a reduction in workplace accidents and employee absenteeism.

Gahan, Sievewright and Evans (2014, p. 4) support this argument, remarking that "investments in better HSWB will provide a positive return on that investment through reduced costs associated with poor HSWB outcomes and improved productivity". Conversely, when HSWB is not done well, organisations may experience reduced productivity, poor competitiveness, shrinking shareholder value, and increased public scrutiny. On the other hand, when an organisation gets HSWB

performance right, there is a more robust and adaptive workplace culture, which leads to greater continuous improvement and better outcomes for an organisation overall (Gahan 2015).

Love et al. (2016) have explored the impact of unplanned events on construction projects' costs and delivery schedules and have described the symbiotic relationship between quality and safety. In their study, they specifically explored the relationship between rework and safety performance, with an understanding that the causes of both rework and safety incidents are interconnected, arguing that "[t]he causes of rework and safety incidents can be traced back to organisational influences, unsafe supervision, preconditions for unsafe acts, and the unsafe acts themselves" (Love et al. 2016, p. 1). The study found that the safety and rework prevention programs, focusing on leadership and worker and team behaviours, saw a reduction in rework required and significantly improved the project's safety performance.

Strong safety leadership and a positive safety climate positively impact safety performance, improve quality of service/produce, reduce costs and improved efficiencies, minimise property damage and product loss, and minimise disruption to the customer (Love et al. 2016).

Societal Impacts

Beyond fatalities, injuries and illnesses are further examples of people-related incidents in the workplace and significantly impact the economy. Globally, workplace injuries and illnesses are estimated to cost the equivalent of 4% of the global GDP (Clarke & Taylor 2018). According to research for Safe Work Australia, Gahan et al. (2014) report that direct (compensation claims and insurance premiums) and indirect (absenteeism, presenteeism and turnover) costs associated with injuries and illnesses sustained in the workplace amounts to approximately $60 billion annually (almost 5% of the Australian Gross Domestic Product). Workers' compensation claims alone are estimated to be greater than $A1.1 billion annually (Gahan et al. 2014). They do not include those injuries where the worker chose not to lodge a compensation claim or the non-financial impacts that may affect the worker, their family or the loss of enjoyment of participating in recreational or non-work-related activities.

In addition, workplace stress reportedly impacts the Australian economy by some $14.8 billion a year, with 75% of psychological injury claims comprising workplace bullying, harassment, and work pressures (SWA 2013). There are claims that this figure may be significantly understated, with as many as "70% of workers who reported they experienced work-related stress [not applying] for workers' compensation" (SWA 2013, p. 2). In the European Union, it is estimated that work-related stress and workplace violence and bullying account for more than 50% of worker absenteeism, costing society more than 20 billion euros per year (Gallagher & Underhill 2012).

2.2.3 Theoretical Approach to the Research

This work-based research study will explore the linkage between safety leadership, climate, and safety performance. The relationship between safety leadership, safety climate and safety performance have previously been explored and identified as requiring further research (O'Dea & Flin 2001). While Wu, C., Luo, Wang, Wang and Sapkota (2020) reports that arguments exist for specific causalities among safety leadership, safety climate and safety performance, the present study only seeks to explore the relationship between the three constructs in the context of an Australian Facility Management Company. The subsequent sections of this chapter will explore each of these three constructs.

2.3 SAFETY LEADERSHIP

2.3.1 Background

Safety leadership is not a concept that stands in isolation – it heavily borrows from a general leadership framework (Daniel 2015). Therefore, one must look outside the field of HSWB to better understand the broader leadership constructs. This section of the literature review will examine what leadership is and how safety leadership may fit this framework.

2.3.2 Theories

The following section summarises seven leadership theories that are popular in the literature. These include transactional, transformational, strategic, ethical, servant, spiritual and authentic leadership. These latter four are newer entries into

the leadership literature and are derived from a values-based approach to leading people.

Transactional Leadership

Transactional leadership adopts the understanding that followers and leaders have different goals, and a transaction occurs between these parties to find a middle ground between these different goals. This is usually through monetary rewards. Transactional leadership is a task-oriented leadership style based on the fulfilment of contractual requirements and preferences of task-performance over relationships (Antonakis, Avolio and Sivasubramaniam (2003), Orazi, Good, Robin, Van Wanrooy, Butar Butar, Olsen and Gahan (2014)).

A transactional leader sets their expectations and explicitly articulates the agreements as to what the team members must achieve and how they will be rewarded. The transactional leader needs to provide regular feedback to their members to maintain progress on the task (Vera & Crossan 2004).

In a transactional leader-follower relationship, "[f]ollowers are motivated by the leaders' promises, praise and rewards" (Bass & Steidlmeier 1999, p. 184). When followers do not meet the transactional leaders' standards or when corrective actions are required, the transactional leader needs to manage this 'exception' (Bass & Avolio 1989).

Transactional leaders thrive in environments where goal setting and routines in structured environments lead to positive outcomes. Transactional leaders may also work well in crises when a clear direction is needed for the common goal and deviation from the task is not accepted.

Transformational Leadership

Transformational leadership aims to inspire and motivate followers to identify with their leader's charismatic aspirations in performing towards a set goal (Bass & Bass 2009). Four components characterise transformational leaders: charismatic, inspirational, intellectually stimulating, and considering of the individual followers (Bass & Steidlmeier 1999) by helping them achieve "extraordinary goals" (Antonakis et al. 2003, p. 264).

Transformational leadership can empower followers through a shared mission and vision. Transformational leaders promote delegation of responsibility to subordinates and enhance subordinates' capacity to think independently, resulting in increased autonomy, higher self-efficacy, and enhanced employee influence on work outcomes (Sun, Zhang, Qi & Chen 2012).

Transformational leaders help promote a culture of trust amongst their followers, which "facilitates communication, allowing employees to speak out to their peers and to their leaders without fear of retaliation" (Orazi et al. 2014, p. 32). However, transformational leaders can only lead to positive outcomes if they can deliver on promises and tangibly connect their followers with the vision and ensure it is translated into reality.

Strategic Leadership

Strategic leadership has been described by Orazi et al. (2014, p. 34) as the "synergistic integration" of the technical skills of transactional and the visionary skills of transformational leadership. Strategic leaders can "anticipate, envision, maintain flexibility, think strategically, and work with others to initiate changes that will create a viable future for the organization" (Ireland & Hitt 1999, p. 43).

Strategic leadership focuses on those at the top of organisations (Vera & Crossan 2004), and these leaders must lead and influence their followers to ensure the stability and viability of their organisation. Strategic leaders develop their organisations so that the human and social capital can respond to threats and remain competitive in the market (Orazi et al. 2014) by setting a clear vision and future for the organisation and creating meaningful advancement toward that purpose (Bass & Bass 2009).

Strategic leadership focuses on short-term stability and taking risks required for long-term organisational benefit, acting "in the present to shape the future, to create what can be, starting from what is" (Orazi et al. 2014, p. 35). Strategic leaders use both sequential and spiral thinking patterns and have strong expectations of their performance from themselves, peers, subordinates, and superiors (Rowe 2001).

Strategic leadership can positively contribute to organisational learning (Asif 2019); namely, the change process is driven by exploring and exploiting new knowledge within the organisation. This organisational learning provides strategic leaders with a level of foresight, allowing them to adapt to unexpected change, deciding how to act depending on the contingencies (Vera & Crossan 2004).

Ethical Leadership

Ethical leadership is defined as the "demonstration of normatively appropriate conduct" (Brown, Treviño & Harrison 2005, p. 120) between a leader's actions and encourages the same actions and behaviours from their followers. An ethical leader influences followers through ethical behaviours appropriate for the given context – normatively appropriate – demonstrating honesty, integrity, fairness and caring, and other such behaviours appropriate for the culture and context of the organisation.

Orazi et al. (2014) highlight that while ethical leadership theory reinforces the importance of ethical attitudes and behaviours, it does not consistently demonstrate ethical behaviours throughout the organisation. Ethical behaviour is beneficial at lower levels in the organisation; however, it decreases at higher levels of the same organisation (Gok, Sumanth, Bommer, Demirtas, Arslan, Eberhard, Ozdemir & Yigit 2017).

Ethical leadership influences followers from the top down when leaders embed the organisation's ethical culture amongst their followers. Ethical leadership has been found to positively impact worker engagement and improve employee well-being (Rantika & Yustina 2017).

Servant Leadership

Servant leadership theory focuses on leadership as a service to the leaders' followers and focuses on putting the needs and interests of their followers ahead of their own (Bass & Bass 2009). Servant leadership is defined as "a holistic approach to leadership that encompasses the rational, relational, emotional, moral, and spiritual dimension of leader-follower relationship such that followers enhance and grow their capabilities, as well as develop a greater sense of their own worth as a result" (Yoshida, Sendjaya, Hirst & Cooper 2014, p. 1395).

Servant leadership supports sustainable organisational performance without sacrificing employees to benefit the organisation's growth and profit (Eva, Robin, Sendjaya, van Dierendonck & Liden 2019). Servant leaders seek to 'serve first' before they aspire to lead (Greenleaf 2002), resulting in increased follower commitment to the organisation, increased focus on the organisation's goals, higher levels of organisational trust, improved employee engagement and satisfaction, and organisational performance (Orazi et al. 2014).

Spiritual Leadership

Spiritual leadership theory refers to the experience of transcendence – a higher purpose – through work and does not relate to religious spirituality (Orazi et al. 2014). Spiritual leadership is defined as "comprising the values, attitudes, and behaviors that are necessary to intrinsically motivate one's self and others so that they have a sense of spiritual survival through calling and membership" (Fry 2003, p. 711). According to Fry (2003), spiritual leadership aims to ensure congruence between the vision and value across all levels of the organisation to improve organisational commitment and maximise productivity.

Spiritual leadership requires the leader to ensure a follower's sense of purpose or calling links with the organisation's vision (Smith, G., Minor & Brashen 2018) and to establish a workplace culture based on altruistic love, demonstrating "genuine care, concern and appreciation for both self and others" (Fry 2003, p. 711). Orazi et al. (2014) highlight that spiritual leadership and workplace spirituality are linked with employee commitment, job satisfaction, team productivity and psychological empowerment.

Authentic Leadership

Authentic leadership has increased in popularity among researchers and practitioners alike as a response to the lack of ethical conduct among business leaders (Orazi et al. 2014) and has "become an important topic in leadership studies" (Alavi & Gill 2017, p. 158). Rooted in Greek philosophy, "authenticity is to know, accept, and remain true to one's self" (Avolio, Gardner, Walumbwa, Luthans & May 2004, p. 802). Avolio and Gardner (2005) define authenticity as "owning one's personal experiences, be they thoughts, emotions, needs, wants, preferences, or beliefs,

processes captured by the injunction to know oneself and further implies that one acts in accord with the true self, expressing oneself in ways that are consistent with inner thoughts and feelings" (Avolio & Gardner 2005, p. 320).

Authentic leadership establishes trust and improves the quality of leader-follower relationships (Gardner, Cogliser, Davis & Dickens 2011) and leader integrity (Leroy, Palanski & Simons 2012). With the increase in poor ethical conduct amongst organisations globally, it is argued that while not a "panacea for corruption and greed… [authentic leadership offers] a positive leadership model that emphasizes integrity, honesty, ethical and moral behavior" (Covelli & Mason 2017, p. 8) to support positive outcomes for organisations and their employees.

2.3.3 Definition of Safety Leadership

Leadership plays a significant role in organisational success (Wu, T.-C. 2005; Stiles, Ryan & Golightly 2018). Wu, T.-C. (2005) highlights that high-quality leadership has increased in importance to respond to the rapidly changing work environment, and without leadership, organisations will not be able to adapt and respond to these challenges effectively. A definition of leadership adopted by the Centre for Workplace Leadership is that of Yukl (1989, p. 253): that leadership is "influencing task objectives and strategies, influencing commitment and compliance in task behaviour to achieve these objectives, influencing group maintenance and identification, and influencing the culture of an organisation." Leadership can be exhibited at any level of an organisation. An individual "does not have to hold formal power in order to exert influence on another person, one does not have to be a manager in order to be a leader." (Orazi et al. 2014, p. 7).

What is clear is that leadership is not management. Leadership is "the art of influencing people by persuasion or example to follow a line of action" (DuBrin, Dalglish & Miller 2006, p. 3), whereas management focuses on the hierarchical, subordinate power structures within an organisation, ensuring position responsibilities are discharged (Yukl 1989; Anzengruber, Goetz, Nold & Woelfle 2017).

Extrapolating from the definition of leadership from Yukl (1989), above, safety leadership revolves around leading and influencing to achieve defined safety goals and objectives. Wu, T.-C. (2005, p. 28) defines safety leadership as "the process of interaction between leaders and followers, through which leaders could exert their influence on followers to achieve organisational safety goals under the circumstances of organisational and individual factors".

The definition of safety leadership adopted for the present study is: "the demonstration of safety values through the creation of a vision and the promotion of wellbeing through the art of engagement, honesty and discipline" (Daniel 2015, p. 11).

Safety leadership has a role in helping people move towards a defined safety goal or direction, and this can be achieved by effective role modelling, teaching and coaching, handling incidents, and allocating required resources where needed (Paivinen 2010). Safety leadership has been used to improve employees' safety behaviour, positively impacting safety performance. Conchie, Moon and Duncan (2013) contend that safety leadership initiatives directed at the supervisory level may be more effective at improving safety than initiatives directed at the broader employee base. Supporting their view, Conchie et al. (2013) emphasise that supervisors within the have a more substantial influence factor on employees' safety attitudes when compared to employees' co-workers. Safety leadership behaviours, such as coaching, sharing safety values, and communications, are positively associated with supervisors' and employees' safety behaviours.

A significant body of literature exists focusing on transactional (Martínez-Córcoles & Stephanou 2017; Mirza & Isha 2017), transformational (Thibault, Gulseren & Kelloway 2019; Smith, T. D., DeJoy & Dyal 2020), and strategic (Vera & Crossan 2004; Bilginoğlu & Yozgat 2018) leadership as it relates to safety in the workplace. Leadership research has shifted away from the traditional leadership approaches, with the systemic failure of corporate leadership due to a lack of ethical and moral leadership, bullying and abusive supervision and toxic emotions in the workplace (Orazi et al. 2014). This rise of new values-based leadership theories, such as ethical (Shafique, Kalyar & Rani 2020), servant (Ye, Yang & Guo 2019), spiritual (Ali, Aziz,

Pham, Babalola & Usman 2020), and authentic (Maximo, Stander & Coxen 2019) leadership are also seeing an increase in the body of literature as it relates to safety; however, the majority of these focus on the moderating effect on employee's psychological safety within the workplace.

Mullen et al. (2017) recommend further examining how different safety leadership behaviours influence workers perceptions of safety climate and outcomes. The authors note that other researchers have previously explored transactional, transformational and safety-specific leadership behaviours.

Study Leadership Paradigm: Authentic Leadership

In response to the review of the literature on leadership theories, in Section 2.3.2, authentic leadership theory has been selected as the leadership paradigm for the focus in this study on safety leadership due to the alignment with the Company's core value of 'care & empathy' linked with 'personal safety leadership'. Authentic leadership is defined as "a pattern of leader behavior that draws upon and promotes both positive psychological capacities and a positive ethical climate, to foster greater self-awareness, an internalized moral perspective, balanced processing of information, and relational transparency on the part of leaders working with followers, fostering positive self-development" (Walumbwa, Avolio, Gardner, Wernsing & Peterson 2008).

Authentic leadership promotes the organisation's capacity to anticipate and respond to problems by engaging with employees and encouraging the concept of balanced (unbiased) processing (Gardner, Avolio, Luthans, May & Walumbwa 2005), where balanced processing refers to the decision-making process of accurately interpreting feedback from tasks and interactions and seeking out the learning opportunities in a challenging situation (Ilies, Morgeson & Nahrgang 2005). As it relates to HSWB, authentic leaders seek out information, actively explore alternative solutions, challenge the status quo, and elicit feedback and criticism from their teams (Eid, Mearns, Larsson, Laberg & Johnsen 2012). Authentic leaders actively demonstrate genuine care and passion for the well-being of the employees and the organisation, aligning values with their teams and promoting reciprocal behaviours (Liu, Y., Fuller, Hester, Bennett & Dickerson 2018).

Safe Work Australia found that leading healthy and safe work requires leaders to build trust with their followers and that "[a]uthentic leaders unambiguously demonstrate an active commitment to [safety]" (O'Neill, Wolfe & Holley 2015, p. 23) by building systems and structures that incorporate practical safety in day-to-day operations.

Agote, Aramburu and Lines (2016) found that authentic leadership behaviour is associated with a follower's trust in their leader. They concluded that "trust is fundamental for the effectiveness of leadership… and [authentic leadership] builds trust" (Agote et al. 2016, p. 50). In a recent Ernst & Young paper on the future of HSWB, trust was identified as a foundational requirement for leaders to progress HSWB outcomes in the workplace (EY 2016). Trust is an essential aspect of effective working relationships, contributing to organisational, group and individual productivity (Brower, Lester, Korsgaard & Dineen 2009).

Authentic leaders "build enduring relationships, work hard, and lead with purpose, meaning and values" (Avolio & Gardner 2005, p. 329). Luthans, Norman and Highes (2006) note that authentic leaders are follower builders, with authentic followership being driven by trust, engagement and workplace wellbeing. Authentic leaders openly share information needed to make a decision with their followers to share openly and accept followers' inputs in this decision-making process (Avolio, Walumbwa & Weber 2009).

Pfeffer (2015) argues that authentic leadership is not helpful and may be impossible to achieve. Citing authentic leadership as a "yet another leadership craze" (Pfeffer 2015, p. 89), Pfeffer argues (with supporting citations of Lieberman (1956); Pfeffer and Salancik (1975); Salancik and Conway (1975); Goffman (1978); Hochschild (1979, 1983)) that leadership behaviours are positional, and people's attitudes change when their behaviours change, making claims of authenticity inconsistent.

Ford and Harding (2011) further argue that "as an indication of a leader's true self" (Ford & Harding 2011, p. 465), authentic leadership, if possible, would have a destructive effect on an organisation. It is suggested that authentic leadership theory does not recognise the imperfection of people as positive psychologic does not acknowledge or explore pathological behaviours (Ford & Harding 2011).

Avolio et al. (2009) highlight that further research is required to validate authentic leadership measurements across various situations, cultures and work environments. Authentic leadership is associated with improved influence on safety performance (Cavazotte et al. 2013) and positive outcomes for followers, including reduced burnout, follower commitment, engagement and empowerment, improved job satisfaction and trust-building capabilities (Orazi et al. 2014).

The following section will outline the dimensions of Authentic Leadership theory.

2.3.4 Dimensions of Authentic Leadership

Authentic leadership is a construct that incorporates aspects of transformational leadership and other positive leadership theories (Avolio et al. 2004). Authentic leadership further expands the transformational leadership model by accentuating authentic behaviours and role modelling a values-based leadership to create an ethical, caring, and inclusive environment. The focus on values and principles, rather than behavioural style, sees authentic leadership building trust between the leader-follower, improving stakeholder relationships and positively influencing organisational culture (Avolio et al. 2004).

Authentic leaders have increased self-awareness, process information unbiased and balanced, have an internalised moral perspective, and are leaders with relational transparency (Walumbwa et al. 2008). Ilies et al. (2005) define authentic leadership's four components: self-awareness, unbiased processing, internalised moral perspective, and relational transparency. These four elements of authentic leadership are outlined below.

Self-awareness refers to the leaders' cognisance of and trust in their values, motivations, feelings, and thoughts (Gardner et al. 2005). Self-awareness demonstrates that a leader is aware of their strengths and weaknesses (Walumbwa et al. 2008). Leaders who have a higher awareness of self will be more self-accepting, have a higher level of autonomy, have more positive relationships with others, and operate in extended flow states (Ilies et al. 2005).

When a leader's self-concepts of their strengths and weaknesses are incongruent with the perceptions of those around them, Rath and Conchie (2008) suggest that this lack of self-awareness can lead to poor employee engagement, strained customer relationships and an increase in workplace stress.

Balanced processing refers to the leaders' ability to process their thoughts and knowledge, experiences, and other external information (Gardner et al. 2005). Leaders who engage in better, unbiased processing will more accurately interpret feedback from tasks and interactions, have a better sense of their skills and abilities, and seek out learning opportunities in challenging situations (Ilies et al. 2005).

A balanced processing leader is better able to "objectively evaluate and accept both positive and negative aspects, attributes and qualities of themselves, including skill deficiencies, suboptimal performance, and negative emotions." (Gardner et al. 2005, p. 356).

Internalised moral perspective refers to whether the leader act according to their 'true self' – in line with their values, motivations and needs instead of merely trying to please others by acting falsely (Kernis 2003). Internalised moral perspective can be seen as behaving authentically. Leaders who are more authentic in their behaviour have more internal motivation for what they do, be more personally expressive in their role as leaders, and have a higher sense of self-esteem (Ilies et al. 2005).

"Leadership principles are values translated into action" (George, Sims, McLean & Mayer 2007, p. 135). A leader's ability to stay true to values—their internal moral compass—especially when it comes under pressure to do act against their values, is a solid indicator to their followers as to whether the leader has their and the organisation's best interest at heart, and ahead of the leader's self-interest and self-preservation (George et al. 2007).

Relational transparency refers to the leader valuing and striving to achieve a sense of transparency in relationships (Gardner et al. 2005). This transparency comes across as truthfulness and openness between the leader and the follower, fostering improved social interactions (Gill & Caza 2018). Leaders who are genuine in their

relationships with those close to them will foster improved learning and development, and the trust formed between the leader and the follower will support more positive relationships (Ilies et al. 2005).

Authentic leadership is a "relational phenomenon" (Alavi & Gill 2017, p. 3), and at its core, it is developed in the context and the interactions between leaders and followers. This relational transparency has a mediating role in the follower's perceptions of psychological safety within the group, trust and integrity towards others (Walumbwa et al. 2008).

2.3.5 Authentic Leadership Inventory

Gardner et al. (2005) developed a self-based authentic leader-follower development model integrating the authentic leader perspectives. This model focused on the leader-follower's self-awareness (values, identity, emotions, motives/goals) and self-regulation (internalised, balanced processing, relational transparency, authentic behaviour). A sixteen item instrument was ultimately developed from these foundational models: the Authentic Leadership Questionnaire (Walumbwa et al. 2008). One significant concern of the Authentic Leadership Questionnaire is that the complete instrument is commercially copyrighted.

Neider and Schriesheim (2011) sought to improve the validity of an authentic leadership assessment and provide greater access to a questionnaire instrument without being constrained by commercial copyright. In doing so, they developed the Authentic Leadership Inventory (ALI) based on the theoretical framework and dimension definitions posited by Walumbwa et al. (2008).

The Authentic Leadership Inventory (ALI) (Neider & Schriesheim 2011) is recommended for use in the methodology to measure the dimensions of authentic leadership within the Company.

2.3.6 Safety Leadership and the Linkage to Safety Climate

The role of safety leadership and its influence on the safety climate of an organisation is increasingly gaining acceptance (Clarke & Ward 2006; Goldenhar, Schwatka & Johnson 2019), with the display of consistent safety leadership behaviour and reactions promoting shared perceptions amongst employees and having a

positive relationship with their perceptions of safety climate of the organisation (Oah, Na & Moon 2018). The following section will explore the literature on the construct of safety climate before safety performance is explored in Section 2.5.

2.4 SAFETY CLIMATE

2.4.1 Background

Organisational climate comprises shared perceptions among employees concerning the selected features or characteristics of their organisational environment (Zohar 2010; Schneider, Gonzalez-Roma, Ostroff & West 2017). Safety climate focuses on perceptions among employees on the selected features or characteristics of their organisational environment as they relate to safety outcomes, such as safety policies, procedures, and practices (Zohar 1980; Oah et al. 2018). This section of the literature review will examine safety climate and how it relates to the current study.

2.4.2 Theories

The construct of safety climate was first introduced as "a summary of molar perceptions that employees share about their work environment" (Zohar 1980, p. 96). Previous studies considered that safety climate was a subset of safety culture (Cooper 2000; Glendon, A. Ian & Stanton 2000) and an expression of an organisation's safety culture (Flin, Mearns, O'Connor & Bryden 2000).

Guldenmund (2000) suggests that safety climate refers to the prevailing safety attitude or perceptions within the organisation, whereas safety culture reflects the underlying beliefs and convictions within the organisation. However, in comparing culture and climate, Hopkins (2006) concludes that the distinction between the two is elusive. Despite their connection and interchangeable references, it should be noted that the concept of culture and climate have arisen from two different disciplines of academia – culture deriving from anthropology and climate being derived from social psychology. As a result, the concepts are generally associated with different research strategies (Hopkins 2006).

Safety climate measures "people's perceptions of safety" (Choudhry, Fang & Mohamed 2007, p. 1001) and the shared perceptions about safety values, norms,

beliefs, practices, and procedures (Flin et al. 2000) within an organisation or workgroup. Some researchers have noted that safety climate however, is "not as a homogenous characteristic of an organisation" (Marín, Lipscomb, Cifuentes & Punnett 2019, p. 495), with discrepancies in perceptions observed across different levels of the organisation (Chen, Li & Goh 2021).

There are numerous perspectives on the dimensions that define and measure an organisation's safety climate. Table 2.4 compares the various dimensions of safety climate from the literature, demonstrating that safety climate measures vary considerably, with substantial variation in questionnaire style, size and factor analysis. Factor analysis for each of the abovementioned safety climate surveys identifies the factor structure of the questionnaire survey items, ranging from 4 dimensions (Cigularov, Lancaster, Chen, Gittleman & Haile 2013; Zhang, Lingard & Nevin 2015) to 9 dimensions (Lingard, Zhang, Harley, Blismas & Wakefield 2014).

Table 2.4 Comparison of Dimensions of Safety Climate

Author(s)	Dimensions of Safety Climate	Country	Industry
Cigularov et al. (2013)	1. Management commitment to safety 2. Supervisor support for safety 3. Safety practices 4. Work pressure	USA	Construction
Glendon, A. I. and Litherland (2001)	1. Communication and support 2. Adequacy of procedures 3. Work pressure 4. Personal protective equipment 5. Relationship 6. Safety rules	Australia	Construction
Kath, Magley and Marmet (2010)	1. Management attitudes towards safety 2. Upward safety communication 3. Job safety relevance 4. Organisational trust 5. Safety motivation 6. Job satisfaction 7. Turnover intentions	USA	Retail
Kines, Andersen, Spangenberg, Mikkelsen, Dyreborg and Zohar (2010)	1. Safety representative's commitment to safety 2. Safety leadership 3. Safety instructions 4. General leadership 5. Worker safety compliance 6. Worker attention to safety 7. Worker involvement in safety	Denmark	Construction
Kines, Lappalainen, Mikkelsen, Olsen, Pousette, Tharaldsen, Tómasson and Törner (2011)	1. Management safety priority, commitment and competence 2. Management safety empowerment 3. Management safety justice 4. Workers' safety commitment 5. Workers' safety priority and risk non-acceptance 6. Safety communication, learning, and trust in co-worker safety competence 7. Workers' trust in the efficacy of safety systems	Nordic Region	Various

Table 2.4 (Continued)

Author(s)	Dimensions of Safety Climate	Country	Industry
Lin, Tang, Miao, Wang and Wang (2008)	1. Safety awareness and competency 2. Safety communication 3. Organisational environment 4. Management support 5. Risk judgement 6. Safety precautions 7. Safety training	China	Various
Lingard et al. (2014)	1. Leadership 2. Organisational goals and values 3. Responsibility 4. Communication 5. Supportive Environment 6. Learning 7. Trust in people and systems 8. Engagement 9. Resilience	Australia	Construction
Zhang et al. (2015)	1. Management commitment to safety 2. Supervisory safety leadership 3. Co-worker safety 4. Individual safety behaviours	Australia	Construction

2.4.3 Definition

While various researchers have interpreted safety climate differently, resulting in no universally accepted definition of safety climate across industries (Choudhry, Fang & Lingard 2009), for the current study: safety climate is defined as "workgroup members' shared perceptions of management and workgroup safety related policies, procedures and practices" (Kines et al. 2011 p.634).

In response to the literature review on safety climate theories, in Section 2.4.2, the researcher has selected Kines et al. (2011) as a reference for their definition and measurement of safety climate due to their validation and reliability across industry contexts and countries, and their intent for it to be used for "research purposes as well as for practical purposes" (Kines et al. 2011, p. 635).

Kines et al. (2011) Nordic Occupational Safety Climate Questionnaire (NOSACQ-50) instrument has been utilised in numerous studies establishing its reliability and validity across cultural and industry contexts (Guldenmund, Cleal & Mearns 2013; Ha, Kim, Son, Ha & Son 2017; Fargnoli & Lombardi 2020).

The following section will outline the seven dimensions of safety climate.

2.4.4 Dimensions of Safety Climate

Management safety priority, commitment and competence refer to the top-level management priority of safety matters and their involvement in safety (Zohar 1980), particularly management's concern for the well-being of workers (Kines et al. 2011). This dimension also includes measuring the perception of workers' trust in management competence for safety.

Management safety empowerment refers to workers' perception of management's trust in their ability and judgment to do their job safely. Kines et al. (2011) note that the reciprocal nature of trust in workers and safety empowerment as it further strengthens social exchanges and reinforces the desired safety behaviours.

Management safety justice refers to workers' perception of management applying a procedural and interactional justice to ensure the fair treatment of workers by supervisors and a fair procedure for dealing with safety issues in the workgroup, which would clearly define the difference between acceptable and unacceptable behaviours (Reason 1998).

Workers' safety commitment refers to developing workgroup norms favouring safety due to the demonstrated safety leadership and standards set by their respective leaders (Kines et al. 2011). This relates to the 'personal safety leadership' value of the Company, that all workers can demonstrate safety leadership.

Workers' safety priority and risk non-acceptance refer to the perception of workers' role in prioritising safety and the degree to which workers speak out against unsafe workplace conditions and risks.

Safety communication, learning, and trust in co-worker safety competence refer to the social interaction, communication and learning necessary for the "creation of social constructs such as organizational climate" (Kines et al. 2011, p. 636). Frequent, open and transparent communication between management and workers is essential for sharing safety ideas, innovations and information (Zohar 1980). This dimension also includes workers' perceptions on the safety competency

of their co-workers, being skills, knowledge and qualifications, which is a common focus of safety climate measurement tools (Flin et al. 2000).

Workers' trust in the efficacy of safety systems refers to the workers' perceptions of the adequacy of safety training, safety systems, and the efficacy of these safety systems and procedures within the workgroup (Flin et al. 2000)

2.4.5 NOSACQ-50 Safety Climate Questionnaire

The development of the NOSACQ-50 safety climate questionnaire was to provide a reliable and valid measurement of "safety climate, covering dimensions based on organizational and safety climate theory, psychological theory, previous empirical research, and empirical results acquired through a developmental process" (Kines et al. 2011, p. 635). The questionnaire had to be suitable for comparative studies between the five Nordic countries of Finland, Denmark, Norway and Iceland, and across industry contexts. Kines et al. (2011) intended for the final NOSACQ-50 safety climate questionnaire to be suitable for both researcher and practitioner to evaluate safety climate, identify areas for improvement, and evaluate interventions (Kines et al. 2011).

The NOSACQ-50 safety climate questionnaire (Kines et al. 2011) is recommended for use in the methodology to measure the dimensions of safety climate within the Company.

2.4.6 Safety Climate and the Linkage to Safety Performance

As previously noted, safety climate has been linked to reflecting worker engagement (Clarke & Ward 2006) and the extent to which an organisation prioritises safety (Guediri & Griffin 2016). Developing a positive safety climate is an essential predictor of safety performance (Wu, T.-C. et al. 2008). For example, in a meta-analysis of the relationship between safety climate and safety performance, Clarke (2006) found that accident causation models demonstrated "a significant pathway between safety climate and accidents mediated by workers' unsafe behaviour… [and] evidence that a positive safety climate maintains safety-related behaviors" (Clarke 2006, p. 316).

Various researchers have highlighted a linkage between safety climate and safety performance within an organisational setting (Zohar 1980; Clarke 2006; Zhou, Fang & Wang 2008; Stemn, Bofinger, Cliff & Hassall 2019). Hofmann et al. (2017) note there is still a lack of research focusing on safety climate and culture, which draws on high-reliability organisations and resilience engineering. This gap in the literature is an opportunity for further research, where safety climate and culture integrate with a focus on safety issues and safety performance. The following section will explore the literature on the construct of safety performance.

2.5 SAFETY PERFORMANCE

2.5.1 Background

Safety performance, its measurement and reporting vary from organisation to organisation, and similarly to safety leadership and safety climate, is considered a subset of the performance of an organisation (Wu, T.-C. et al. 2008). Primary reporting of safety performance in publicly listed companies' annual reports is that of LTIFR, a lagging indicator of the number of injuries sustained requiring one or more shifts to lost per million hours worked. O'Neill (2010) detailed a range of HSWB performance metrics from a financial and non-financial perspective which goes further than the standard measurement of frequency rates which could form part of an organisation's HSWB KPIs. These include financial costs of compensation claims, the total number of incidents and near-miss reports, the severity of injuries, and the lost productivity resulting from injuries. In most instances, however, research is focused primarily on a comparison of injury frequency rates to provide a benchmark or comparison across industries of actual results of statistical safety performance (Ferguson 2015), which is a very narrow indicator of safety performance as it "can often fail to consider safety activities beyond raw numerical data" (Ferguson 2015, p. 22).

The literature was reviewed to explore the concept of safety performance, how this can be measured, and where this can be mapped to existing metrics within the Company.

2.5.2 Theories

Traditional safety performance measures rely predominately on incident or injury data (Vinodkumar & Bhasi 2010), with organisations frequently using incident and injury performance measures as key performance indicators, including LTIFR, TRIFR, and the number of reported incidents (O'Neill et al. 2015). Safety performance, however, more broadly relates to the measurement outcomes of the management control systems to report their performance against a desired objective or goal (O'Neill et al. 2015). Organisational safety performance is commonly measured by separating leading and lagging indicators (Shea, De Cieri, Donohue, Cooper & Sheehan 2016), a change in response to the over-reliance on lagging injury frequency rates as highlighted by Ferguson (2015).

Lagging indicators focus on measuring the past HSWB performance (Erikson 2009). These may include injury frequency rates, incident reports, and compensation claims. On the other hand, leading indicators measure "the things people actually do for safety" (Blair & O'Toole 2010, p. 29) – the behaviours, processes, and actions that benefit HSWB outcomes. Thus, leading indicators are critical to proactive HSWB management and performance (Shea et al. 2016).

In their framework for linking safety climate to safety performance, Griffin and Neal (2000) explain performance as composed of task performance and contextual performance. In a safety context, task performance can be viewed as safety compliance – behaviours deemed core to a worker's role and contextual performance as safety participation – voluntary behaviour beyond a worker's formal role (Clarke 2006). Griffin and Neal's categorisation of safety performance has been built on by various researchers [Hon et al. (2014); Guo, Yiu and González (2016); and Vinodkumar and Bhasi (2010)], who have continued to refine the framework. For example, Hon, Chan and Yam (2014) included near misses and injuries as an additional component of safety performance.

Broadly, self-reporting survey methodologies have been deployed to understand individuals' perceptions of their safety compliance and participation, with respondents rating their agreement with a statement on a 5-point Likert scale. Across the literature reviewed, each component of safety performance had between

two to seven statements for respondents to rate their agreement with the statement. Examples of these self-responses have been summarised in Table 2.5.

Table 2.5 Comparison of Safety Performance Perception Statements

Author(s)	Participation	Compliance	Occupational Injuries
Guo et al. (2016)	How often do you assist others to make sure they perform their work safely? How often do you speak up and encourage others to get involved in safety issues? How often do you try to change the way the job is done to make it safer? How often do you take action to stop safety violations in order to protect the well-being of coworkers?	How often do you wear a hard hat in designated areas? How often do you wear eyes protection hat in designated areas? How often do you wear proper PPE when working on or near live electricity? How often do you wear PPE when working at heights?	-
Griffin and Neal (2000)	I use the correct personal protective equipment for the task I am doing. I often take part in development of the safety requirements for my job.	I use the correct personal protective equipment for the task I am doing. I often take part in development of the safety requirements for my job.	-
Hon et al. (2014)	How frequent do you put in extra effort to improve safety of the workplace? How frequent do you voluntarily carry out tasks or activities that help to improve workplace safety?	You follow all of the safety procedures for the jobs that you perform. Your coworkers follow all of the safety procedures for the jobs that they perform.	How many times have you exposed to a near miss incident of any kind at work? How many times have you suffered from injury of any kind at work, but did not require absence from work? How many times have you suffered from injury, which require absence from work not exceeding 3 consecutive days? How many times have you suffered from injuries, which require absence from work exceeding 3 consecutive days?

Table 2.6 (Continued)

Author(s)	Participation	Compliance	Occupational Injuries
Vinodkumar and Bhasi (2010)	I help my co-workers when they are working under risky or hazardous conditions. I always point out to the management if any safety related matters are noticed in my company. I put extra effort to improve the safety of the workplace. I voluntarily carry out tasks or activities that help to improve workplace safety. I encourage my co-workers to work safely.	I use all necessary safety equipments to do my job. I carry out my work in a safe manner. I follow correct safety rules and procedures while carrying out my job. I ensure the highest levels of safety when I carry out my job. Occasionally due to lack of time, I deviate from correct and safe work procedures. Occasionally due to over familiarity with the job, I deviate from correct and safe work procedures. It is not always practical to follow all safety rules and procedures while doing a job.	-

2.5.3 Definitions

While various researchers defined safety performance based on the context of their studies, (Hon et al. 2014) have adopted a broad definition that extends to co-workers, clients, members of the public and the environment. After reviewing several definitions, this best aligns with the values and goals of the Company. It is most appropriate for the current study safety performance is defined as the ‘‘actions or behaviors that individuals exhibit in almost all jobs to promote the health and safety of workers, clients, the public, and the environment’’ (Burke, Sarpy, Tesluk & Smith-Crowe 2002, p. 432).

2.5.4 Safety Compliance, Safety Participation and Occupational Injuries

Issues have been raised with self-reported response surveys, particularly those where the respondents are led to generalise their habits. Zikmund, Babin, Carr and Griffin (2013) argue that “a person is likely to portray an ideal behaviour” (Zikmund et al. 2013, p. 343) when generalising their response to the statement or question. In looking at measuring safety performance through the lens of safety compliance, safety participation and occupational injury, there is a gap in the literature around quantifiable HSWB metrics, and a reliance on self-reported survey responses.

For the current study, the measures of Griffin and Neal's categorisation of safety performance as safety compliance and safety participation will be adopted with the inclusion of occupational injuries [Hon et al. (2014); Guo et al. (2016); and Vinodkumar and Bhasi (2010)]. The Company's performance metrics will be reviewed and mapped to the three measures of safety performance (Hon et al. 2014) to address the issues raised with respondents self-reporting their safety performance.

2.5.5 Influences on Safety Performance

Numerous factors contribute to an organisation's safety performance, and it is essential to have "a clear understanding of [these] factors" (Mohammadi, Tavakolan & Khosravi 2018, p. 383) in order to improve safety performance and support accident prevention.

Mohammadi et al. (2018) identified thirteen factors from the literature influencing safety performance on construction projects, including motivation, rules and regulations, HSE competency, safety investment and costs, financial aspects and productivity, resource and equipment, work pressure, work condition, culture and climate, attitude and behaviour, lesson learned from accidents, organisation, and safety programs and management systems. The authors mapped these influencing factors against the individual worker and the specific projects completed at the company and governmental levels.

Zwetsloot, van Scherppinggen, Bos and Dijkman (2013, p. 193) explored the relevance of values in supporting HSWB within organisations, arguing that values impact "decision-making, acting, and on the behavior of the managers and workers". They identified three clusters of values comprising seven values contributing to the HSWB performance. These included valuing people (interconnectedness, participation and trust), valuing individual and desired behaviour (justice and responsibility), and valuing personal and organisational development (development and growth, and resilience). However, simply stating these values alone will not change an organisation's HSWB performance. The values have to be 'lived' by individuals to become "the ethical compass" (Zwetsloot et al. 2013, p. 193) for the organisation as a whole.

2.6 CONCEPTUAL MODEL

The study revolved around three central themes of safety leadership, safety climate and safety performance which have been identified as warranting further research (O'Dea & Flin 2001), specifically within the context of a Company with an espoused value of safety leadership, with no measure of safety leadership prioritisation or impact within the workforce and no understanding of the organisation's needs to improve safety performance, beyond that of injury rates.

While the concepts of leadership and climate cannot drive change in performance (Antonsen 2009; Nævestad 2009), the literature demonstrate that leadership influences climate, which is positively related the organisation's safety performance. The literature review has led to a focus on authenticity in leadership, due to the positive outcomes for followers, in terms of engagement, empowerment, and increases in reciprocal trust and alignment to the organisation's core value of 'care & empathy'.

This study focuses on Safety Leadership and its Relationship with Safety Performance. As part of the Professional Studies program, a work-based project will be undertaken in conjunction with an Australian Facility Management Company. The study aims to investigate the relationship between Authentic Leadership, Safety Climate and Safety Performance within the context of an Australian Facility Management Company. The current study sought to explain the nature of the possible relationship between authentic leadership and safety performance, with the aim of investigating the relationship between Authentic Leadership, Safety Climate and Safety Performance within the Company and to undertake a project intervention as part of the case study to understand its impact on these measures.

A conceptual model for the research is presented in Figure 2.3, proposing the relationships between authentic leadership, safety climate, and safety performance to be examined in the context of the practice-based research project. As noted by Tobi and Kampen (2018, p. 1211), the conceptual design is a starting point for research design as it "addresses the 'why' and 'what' of a research project at a conceptual level". The conceptual model details the dimensions of Authentic Leadership, Safety Climate and Safety Performance to be explored in the current

study. Sample demographics are included in the conceptual model to understand if there are any perception differences between worker types within the organisation.

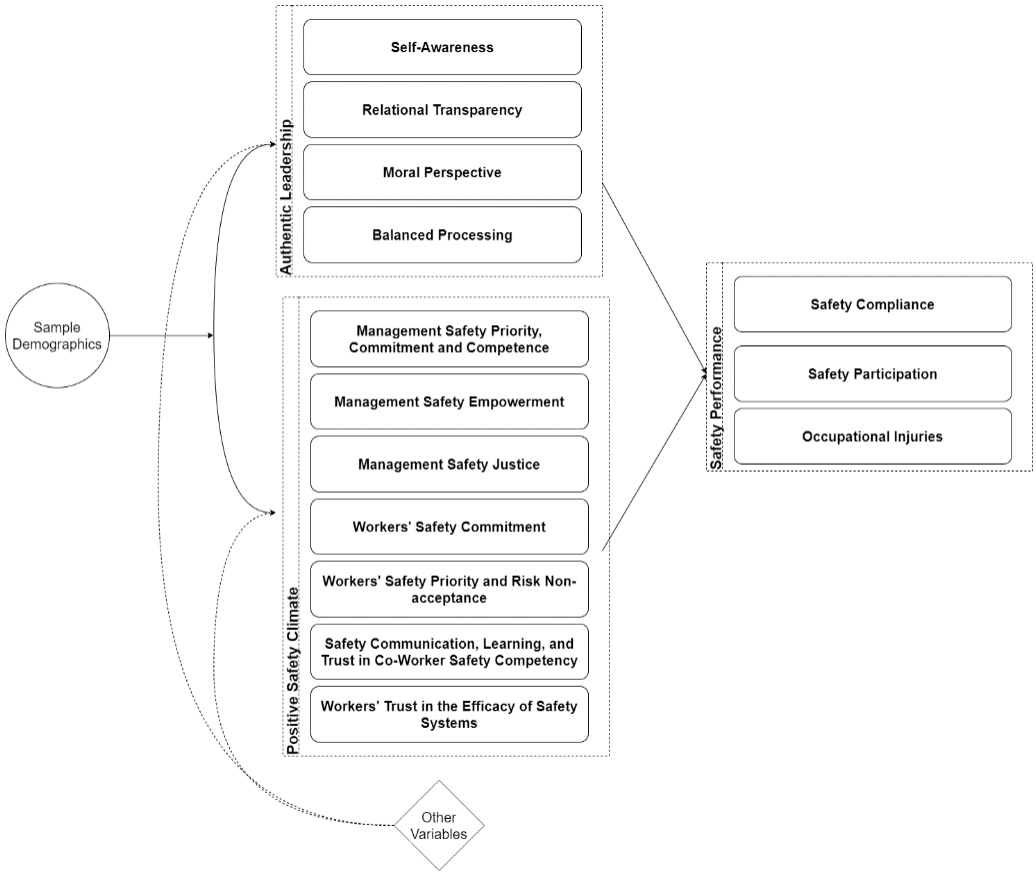

Figure 2.3 Conceptual Model of the Study

2.7 RESEARCH QUESTIONS

This research aimed to explain the nature of the possible relationship between Safety Leadership through the lens of Authentic Leadership, and Safety Performance within the workplace. The current state of knowledge on safety leadership and safety performance identified in the literature review underpins the questions which aim to address the practice-based research project assessing the relationship between Authentic Leadership and Safety Performance.

Two research questions have been identified as part of this practice-based project, with associated sub-research questions:

1. What is the relationship between Authentic Leadership, Safety Climate and Safety Performance within an Australian Facility Management Company?

a. How does Authentic Leadership interact with Safety Climate within an Australian Facility Management Company?

b. How does Authentic Leadership relate to Safety Performance within an Australian Facility Management Company?

c. How does Safety Climate relate to Safety Performance within an Australian Facility Management Company?

d. What are the Trades-based and Office workers' perceptions of Authentic Leadership within an Australian Facility Management Company?

e. What are the Trades-based and Office workers' perceptions of Safety Climate within an Australian Facility Management Company?

f. What is the Safety Performance of an Australian Facility Management Company?

2. What are the respondents' perceptions of change to Authentic Leadership, Safety Climate and Safety Performance attributed to the Leadership, After-Action Review and Learning Team interventions of an Australian Facility Management Company?

2.8 PROPOSITIONS

In order for the case study to adequately respond to the research problem and research questions, two propositions have been developed, which will be evaluated through the research methodology.

1. Authentic Leadership and Positive Safety Climate are positively related to Safety Performance in the context of an Australian Facility Management Company.

2. The Leadership, After-Action Review, and Learning Team interventions have a positive impact on Authentic Leadership, Safety Climate and Safety Performance as perceived by the Australian Facility Management Company workers.

2.9 CONCLUSIONS

This chapter presented the extant literature locating the research within the context of an Australian Facility Management Company. Safety leadership literature was then presented before defining Authentic Leadership as the leadership paradigm to be used in the current study, with the linkage between Safety Leadership and Safety Climate. Theories of safety climate were presented with dimensions of the NOSACQ-50 Safety Climate Questionnaire detailed as the selected instrument to evaluate the safety climate of the Company. The discrepancies between perceptions across differently levels of an organisation has been highlighted as an area of consideration based on the literature. The connection between safety climate and performance was then demonstrated before exploring the literature on organisational safety performance.

The chapter concluded with the conceptual model underpinning the study, from which the research questions are derived. In order to adequately respond to the research questions, two propositions are presented, and the study research methods described in Chapter 3 will indicate how the research questions are evaluated and the case study propositions confirmed or rejected.

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CHAPTER 3 RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

The previous chapter provided the necessary knowledge and context of safety leadership, safety climate and safety performance required to develop a conceptual framework for the study's design to explore the relationship between authentic leadership and safety performance within an Australian Facility Management Company. This chapter describes the research design and methodology of the study.

This chapter will demonstrate the theoretical underpinnings of the research design and describe the stages of the research methodology using a mixed-method approach within a case study design. The structure of this chapter is shown in Table 3.1.

Table 3.1 Structure of Chapter 3

Section	Content	
3.1	Introduction	
3.2	Research Framework	
3.3	Approaching the Research	Philosophical Worldview Research Design Research Method Purpose of the Research
3.4	Case Study Protocol	Case Definition Units of Analysis Phases of the Study Project Interventions
3.5	Phase One – Quantitative Data Collection and Analysis	Survey Design, Development and Delivery Safety Performance Metrics Quantitative Data Analysis
3.6	Phase Two – Qualitative Data Collection and Analysis	Focus Group Interviews Key Stakeholder Interviews Qualitative Data Analysis
3.7	Limitations of the Research Design	
3.8	Research Ethics	
3.9	Conclusion	

3.2 RESEARCH FRAMEWORK

The previous chapter provided a detailed review of the literature on safety leadership, safety climate and safety performance. The literature review aims to

provide a summary of the current knowledge of a topic and, as noted by Rowley and Slack (2004), supports the identification of new research questions and organising of key concepts.

The literature review demonstrated that while much research has been undertaken in "high hazard settings" (Pilbeam et al. 2016, p. 119), such as mining, construction and oil and gas, there is a gap in the literature for safety-focused research in other industry sectors, including the facility management sector. Furthermore, while studies on safety leadership interventions are not new, Mullen et al. (2017, p. 41) conclude that "[t]here remains a need for safety leadership intervention studies to assess the impact of specific safety leadership behavior (i.e., transformational, transactional, supportive, etc.)" to determine whether interventions improve safety leadership and the impact this has on leader's behaviours, safety compliance and safety participation within the workforce. Authentic leadership has been previously been associated with improved influence on safety performance (Cavazotte et al. 2013); however, the application of Neider and Schriesheim (2011)'s Authentic Leadership Inventory (ALI) and measuring the relationship between safety climate and safety performance has not been undertaken.

This practice-based project explored whether safety leadership, through a lens of authentic leadership, impact safety performance. The study sought to connect the relationships between authentic leadership and safety climate and measure the impact on safety performance, applying a practice-based pedagogy through the implementation of work-based project activities within an Australian Facility Management Company.

The practice-based project will seek to apply and validate two separate survey instruments [Neider and Schriesheim (2011)'s Authentic Leadership Inventory (ALI) and Kines et al. (2011)'s Nordic Safety Climate Questionnaire (NOSACQ-50)] in the context of a leading Australian Facility Management Company. The practice-based project tested these instruments in novel settings, demonstrating the applicability of these tools to the context of the facility management sector in Australia.

3.3 APPROACHING THE RESEARCH

Creswell (2014, p. 5) recommends that a researcher consider "the intersection of philosophy, research designs, and specific methods" when planning and conducting research, refer Figure 3.1. In this framework, the philosophical worldview is the assumptions that the researcher brings to the study and is related to the research design and the specific research procedures and methods undertaken throughout the study. This section describes the philosophical worldview, the research design and research methods as three components involved in the work-based research and learning approach undertaken by the researcher.

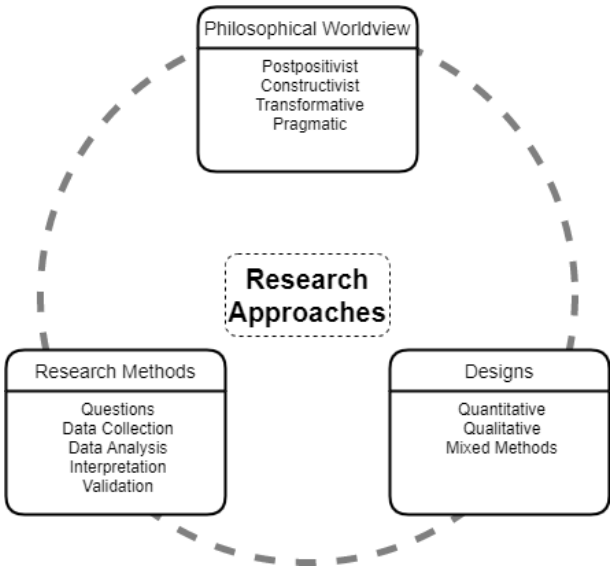


Figure 3.1 The Interconnectedness of Worldview, Design and Research Methods

Adapted from Creswell (2014, p. 5)

3.3.1 Philosophical Worldview

The philosophical worldview is defined as meaning "a basic set of beliefs that guide [the researcher's] action" and the worldview of the researcher (Guba 1990, p. 17). Kaushik and Walsh (2019) liken philosophical worldview to reflexivity, describing it as "a way of thinking about and making sense of the complexities of the real world" (Patton 2002, cited in Kaushik and Walsh (2019, p. 1)). Philosophical worldviews encompass four common elements: axiology, ontology, epistemology, and methodology (Denzin & Lincoln 2005).

Four philosophical worldviews are commonly discussed in the literature (Creswell 2014), including advocacy / participatory, constructivism, post-positivism,

and pragmatism. The major elements of these four worldviews are presented in Table 3.2. According to Creswell (2014), the researcher is influenced in their choice of worldview by their supervisors, any previous research experience, and the field of study where the research is undertaken.

Table 3.2 Comparison of Four Philosophical Worldviews

Worldview	Major Elements
Advocacy / Participatory	Researcher action is focused on bringing about change in practices.
	Research is intertwined with politics and political agenda.
	Focuses on the needs of people requiring empowerment.
	Research is completed with others, so is practical and collaborative.
Constructivism	Meaning is constructed as the researcher engages with the world and make sense of it based on historical and social perspectives.
	Researchers seek to understand the context and setting.
	Meaning is always generated socially – arising in and out of interaction with others and the data gathered in the field.
Post-positivism	Absolute truth can never be found – research evidence is always imperfect.
	Research is the processes of making and refining or abandoning claims.
	Knowledge is shaped by data, evidence and rational considerations.
	The research seeks to explain the situation of concern or causal relationships.
	Objectivity is essential.
Pragmatism	Pragmatism is not committed to any one system of philosophy and reality. Research is always social, historical, and political.
	Truth is what works at the time and uses both qualitative and quantitative data to provide the best understanding of a research problem.
	The researcher looks at what and how to research, based on the intended consequences of the research and where they want to go with it.

Adapted from Creswell (2003); Creswell (2014)

In determining an appropriate philosophical worldview to approach the current project, the researcher considered the post-positivist and pragmatist paradigms. Post-positivists hold a cause and effect philosophy and accept a more traditional approach to undertaking research focusing on antecedent conditions, applying the scientific method – forming a theory, collecting data to support or refute the theory, and revising before testing again (Creswell 2014). The pragmatic paradigm, in contrast, "arises out of actions, situations, and consequences rather than antecedent conditions" (Creswell 2014, p. 10). Rather than focusing on a single method, a pragmatic worldview allows the researcher to use any available approach to understand the problem worth researching, underpinning a mixed-methods philosophy (Creswell 2014).

In approaching this current research, the researcher took a pragmatist worldview, primarily because there because it “arises out of actions, situations, and consequences, rather than antecedent conditions” (Creswell 2014, p. 10). Further, because the pragmatic worldview is not tied to a single method of enquiry, the researcher can use a combination of what methods work to understand the problem (Creswell 2014). So, applying both qualitative and quantitative methods draw elements from both the constructivist and post-positivists approach resolving the research problem.

The research problem is of central focus in a pragmatic worldview, and the research design and methods are chosen “to provide insights into the question” (Mackenzie & Knipe 2006, p. 5). The pragmatic worldview does not consider truth an absolute construct and acknowledges that reality can change. The pragmatic worldview “links theory and praxis” (Greenwood & Levin 2005, p. 55), so it is well suited to real-world problems which are complex and “messy” (O'Leary & Hunt 2016, p. 10) and helps “facilitate human problem-solving” (Powell 2001, p. 884) and deal with problems as they arise.

The Company has a Zero Harm statement of intent and an underlying belief that all injuries are preventable. This is underpinned by two of the Company’s core values of ‘personal safety leadership’ and ‘care & empathy’; however, there is no understanding of how these values are operationalised and how they are measured beyond injury rates. While safety leadership is highlighted as a value of the Company, there is no measure of safety leadership prioritisation or impact within the workforce and no understanding of the Company's needs to improve safety performance.

The current research is situated within the context of the workplace, where “[r]esearch becomes praxis – practical, reflective, pragmatic action” (Guba & Lincoln 2005, p. 34), focused on understanding real-world problems. The researcher considers the pragmatic worldview to be the most appropriate philosophical paradigm to approach this research as it supports the use of mixed-method design, an approach encouraged by Creswell (2014) as it provides the researcher flexibility to use different methods, assumptions and forms for data collection and analysis (Creswell 2014).

3.3.2 Research Design

Research design is the documentation of four key components, namely, defining the problem or question to be studied, gaps in the existing body of knowledge, determining the sample group and the importance of the problem or question to the sample group, and defining the aim of the proposed study (Creswell 2014). The most appropriate research design and enquiry strategy must be defined if the research objectives are to be achieved and ensure the data collection methodology provides suitable data reliability (Hair, Black, Babin, Anderson & Tatham 2006).

The research questions are used in this case study to understand a socio-cultural phenomenon within the context of an Australian Facility Management Company and to guide the research methodology. Yin (2009) defines a case study as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin 2009, p. 18) . A case study design allows for the most appropriate research method to be applied to the context of the case and the research problem.

A Type 2 embedded, single-case study design was used for the current research, including case definition, identification of units of analysis based on worker type (Marín et al. 2021) and consideration of reliability and validity (Yin 2009), as presented in Figure 3.2. The Case Study Protocol, including a definition of the case, units of analysis, phases of the study, and the project interventions, are detailed in Section 3.4.

Figure 3.2 Proto-Theoretical Model of Embedded, Single-Case Design

Evidence collected as part of the case study were derived from multiple sources, which included documents, archival records, focus groups and interviews, observations, and physical artefacts (Yin 2009). These will be described in further detail in Sections 3.4.3 (Phases of the Study), 3.5 (Quantitative Data Collection and Analysis), and 3.6 (Qualitative Data Collection and Analysis). The advantage of the case study design, and multiple sources of evidence, is the opportunity for the convergence of evidence to adequately respond to the research problem and research questions (Yin 2009).

3.3.3 Research Method

There are three types of research methods available for researchers to apply in their methodology: quantitative, qualitative, and mixed methods. Within the pragmatist worldview, mixed-methods approaches are encouraged; however, the researcher is advised to justify the reasons and mixture of quantitative and qualitative in choosing a mixed-methods approach (Creswell 2014). Hair et al. (2006) recommend that a clearly articulated data collection method establishes reliability in the research method. However, the reasons why quantitative and qualitative data are being mixed as part of the mixed method must be provided when applying a mixed-method approach to a study.

Quantitative

The main aim of quantitative research is to "generate knowledge and create understanding about the social world" (Burrell & Gross 2017, p. 1378). Quantitative methods are most suited for identifying relationships between variables (Creswell 2014), used for measuring and explaining causal relationships and measuring and quantifying phenomena (Denzin & Lincoln 2005). Common enquiry strategies for quantitative research include using surveys or experiments and relying heavily on mathematic and statistical models and analysis (Denzin & Lincoln 2005; Creswell 2014; Burrell & Gross 2017). Quantitative research allows the results of a sample population to be considered representative of the larger population when conducted effectively (Burrell & Gross 2017).

Qualitative

Qualitative research aims to provide interpretation and meaning to social constructs without relying on numerical measurements (Zikmund et al. 2013). According to Denzin and Lincoln (2005), qualitative research locates the researcher in the research setting as they attempt to make sense of and interpret the phenomena being studied. Qualitative research can assist in creating a deeper and richer understanding of the phenomena beyond numerical measurements (Creswell 2014). Qualitative research approaches tend to lend themselves toward smaller sample sizes that are often targeted for exploratory studies (Zikmund et al. 2013). It should be noted that the relatively small sample sizes usually found in qualitative research limits the researcher's ability to measure any variation of responses or draw statistical generalisations to a larger population (Guest, Namey & Mitchell 2013).

Mixed-Methods

On their own, quantitative approaches are not adequate in addressing the complexities of social work-based topics (Creswell & Plano Clark 2011), such as leadership. Together, the objectives of both quantitative and qualitative approaches meet the aims of the current study and contribute valuable insight to the relationship between authentic leadership and safety performance. In addition, there is strength in combining the two approaches to find "a balance between subjectivity and objectivity" (Doyle, Brady & Byrne 2016, p. 265). Table 3.3 illustrates data collection methods that could be utilised from a pragmatist worldview, using quantitative and qualitative methods.

Table 3.3 Data Collection Methods for Pragmatic Worldview

	Quantitative	**Qualitative**
Approach	Measure and Test	Observe and Interpret
Data Collection Approach	Structured; Categorical	Unstructured; Free form
Data Collection Methods	Survey Instruments	Survey Questionnaire
	Organisational Data	Focus Groups; Interviews; Observations
Sample Size	Large	Small

Adapted from Zikmund et al. (2013); Parvaiz, Mufti and Wahab (2016)

Limitations of one approach are minimised by the strength of the other (Johnson & Onwuegbuzie 2004). A mixed-method design is, therefore, able to ensure the research question can be answered using the best method available (Doyle et al.

2016); contributing depth and meaning to the phenomena by incorporating the "voices of participants" (Creswell & Plano Clark 2011, p. 150), as well as providing empirical evidence for any research claims (Creswell 2014).

3.3.4 Purpose of Research

Many mixed-methods designs and typologies have been developed and inform data collection procedures (Creswell 2014; Doyle et al. 2016). Creswell and Plano Clark (2011) detail four mixed-method designs; triangulation, embedded, explanatory, and exploratory. The authors further provide a framework for selecting a mixed-method design that best matches the study based on three decision criteria – timing, weighting, and mixing.

The purpose of the research was to design and implement a rigorous research methodology estimated to most appropriately respond to the purpose of the study and response to the research problem and questions. Following the decision criteria provided by Creswell and Plano Clark (2011), and due to the nature of the problem, an explanatory mixed-method approach was identified as being most appropriate for the study, as depicted in Figure 3.3.

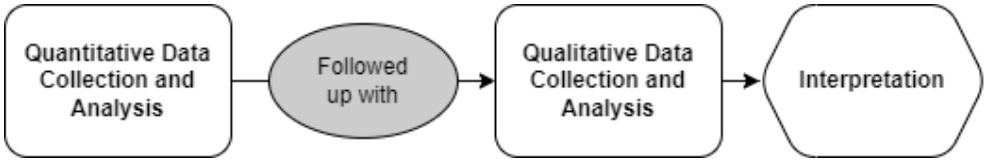


Figure 3.3 Explanatory Mixed Method

Adapted from Creswell and Plano Clark (2011, p. 63)

The purpose of the explanatory mixed-method study was to understand the safety leadership, safety climate and safety performance of the Company. Based on the quantitative measures of safety leadership, safety climate and safety performance, the study sought to gain a deeper understanding of the quantitative results through qualitative enquiry and analysis.

3.4 CASE STUDY PROTOCOL

3.4.1 Case Definition

The present study was undertaken within the work-based context of an Australian Facility Management Company, specifically within their Victorian and

Tasmanian operations. The Company has a Zero Harm statement of intent and an underlying belief that all injuries are preventable. This is underpinned by two core values of 'personal safety leadership' and 'care & empathy'. Safety leadership is highlighted as a value of the Company. However, there is no measure of safety leadership prioritisation or impact within the workforce and no understanding of the Company's needs to improve safety performance. To foster a positive safety climate and improve safety performance, safety leadership needs to be embraced and prioritised throughout an organisation (Biggs et al. 2008).

Established in 1951 as a painting services company, the Company is now a leading provider of facility maintenance and asset management solutions for clients across a diverse portfolio of government and private sector industries, including education, utilities, social housing, corrections and aviation across Australia. The Facility Management Company's services include reactive maintenance, lifecycle capital management programs, grounds maintenance, utility services, security, cleaning, catering and visitor management.

The Company employs approximately 900 employees, with approximately 30% located within the Victoria/Tasmania region. The scope of the present study is the Victoria/Tasmanian operational workgroups, consisting of an average of 278 workers across the study period[4]. Worker roles included 35% trades-based workers and 65% office workers.

The Victoria/Tasmanian operational workgroups consist of 15 workgroups[5] across local government, water and electrical utilities, corrections, social housing, education, aviation, aged care, manufacturing and not-for-profit industry sectors. Throughout the thesis, workgroups have been identified by International Phonetic Alphabet pseudonyms (e.g. Alpha, Bravo, Charlie, etc.).

3.4.2 Units of Analysis

The case comprises four groupings of workers of interest to the study, as identified through the Research Questions. These are defined as the units of analysis

[4] 285 employee in 2017. 268 employees in 2018.
[5] 16 workgroups in 2017. 14 workgroups in 2018.

(Yin 2009) and are presented in Figure 3.2. The workers of the Company were grouped into two units of analysis based on their role type and whether they were people leaders.

Firstly, all workers were identified as either Trades-based or Office workers. Trades-based workers included electricians, plumbers, carpenters, caterers, cleaners, groundskeepers, labourers, and contractors. Office workers included sales, finance, call centre operators, schedulers, engineers, concierge, and other administrative-based support functions.

Additionally, all workers were identified as being People Leaders or not. People Leaders within the Facility Management Company included supervisors and coordinators, contract managers, regional managers, operational managers, and executive managers.

3.4.3 Phases of the Study

The current research had two phases, as presented in Figure 3.4. The study commenced with a Quantitative Data Collection and Analysis in Phase 1. Phase 1 contained two data collection points on either side of the Project Intervention outlined in Section 3.4.4. The data collection and analysis protocol are described in Section 3.5.

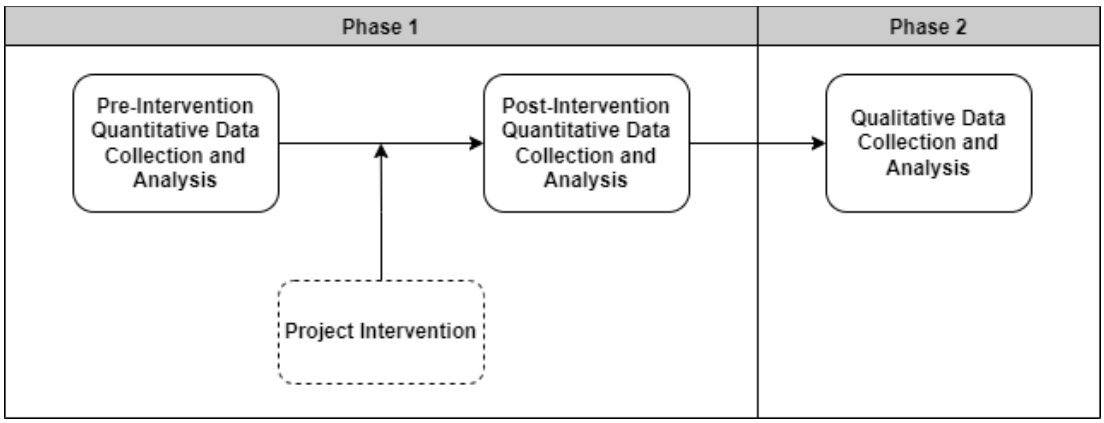


Figure 3.4 Phases of the Study

Phase 2 of the study contained the Qualitative Data Collection and Analysis. It was sequentially after the Quantitative Data Collection and Analysis phase, allowing an opportunity to gain a deeper understanding of the quantitative results considering

the context of the case through focus groups and key stakeholder interviews. The data collection and analysis protocol are described in Section 3.6.

3.4.4 Project Interventions

The researcher was supported in completing the current study by his direct manager and endorsed by the operational executive manager of the Company. By mutual agreement, the current study exploring the relationship between safety leadership and safety performance included practitioner-based, non-experimental activities to support the Company in delivering safe operational outcomes, based on the researcher's insider insights into the organisation (Teusner 2016). Through consultation with the researcher's manager and operational executive sponsor, the agreed work-based project would aim to:

1. Support the safety leadership capabilities of the leaders across the region's workgroups through a safety leadership workshop.
2. Improve safety performance and learning through the introduction of after-action reviews.
3. Conduct a series of learning teams to close the gap between work-as-imagined and work-as-done.

The Leadership, After-Action Review and Learning Team Interventions, described in the following sections of this chapter, were implemented within the work-based learning project as pragmatic and applied activities of the practice-based pedagogy of work-based learning that, as Armsby (2000) highlights, makes work-based learning meaningful to the practitioner-researcher and the Company. Given the research problem and purpose of the study, the idea of an Authentic Safety Leadership construct underpinned the intention of this work-based research.

Leadership Intervention

Purpose

The Leadership Intervention involved developing and delivering a safety leadership workshop for the leaders of the Company's workgroups. The focus on safety leadership was linked to the current study's literature review, the Company's core values of 'personal safety leadership' and 'care & empathy', and the researcher's

observations of a broad range of safety leadership approaches being demonstrated across the region. The Leadership Intervention aimed to support the safety leadership capabilities of the leaders across the region's workgroups and introduce the subsequent project interventions.

Scope

This workshop was designed to introduce the concepts of safety leadership, safety climate and safety performance. The workshop will explore the preliminary results of the Pre-Intervention Phase One survey and introduce authentic leadership as an approach that may influence the safety climate within the Company.

The Leadership Intervention was delivered to the Company's contract leaders, including Contract Managers, Facility Managers, Operations Managers, Facility Coordinators, in a standing monthly Contact Manager's meeting, and a follow-up session was provided to a new contract that was mobilised following the initial session being held. In total, 30 leaders participated in the Leadership Intervention.

Format

The Leadership Intervention consisted of a PowerPoint presentation and a workbook for participants to reference during and following the workshop. The researcher also developed a Facilitator's Guide to supplement the PowerPoint presentation, with an allocation of suggested timing for each section of the workshop. Figure 3.5 presents a selection of artefacts developed for the Leadership Intervention. The Leadership Intervention presentation is presented in Appendix F.

Figure 3.5 Examples of Artefacts Developed for the Leadership Intervention Developed for the Work-Based Project

Participants were introduced to the NOSACQ-50 safety climate survey to measure employee perceptions on seven key dimensions of the Company's safety climate. It was noted that safety climate surveys could be considered a 'pulse check' at any given point in time.

The Leadership Intervention focused on safety leadership and proposed that only a small aspect of leadership is visible and more about self-leadership and self-awareness. Authentic leadership was then discussed as a leadership theory that may assist participants in building relationships, trust and cooperation within their workgroups. The four dimensions of the Authentic Leadership Inventory (Neider & Schriesheim 2011) were then explored before closing with an understanding of what makes an authentic leader in the context of safety leadership.

The researcher shared a reflective anecdote of a simple care and empathy maxim described by his manager as the GAS Principle – to "give a shit" about your people (Fogarty 2016), suggesting that when people feel like their colleagues and manager/supervisor cares about them as a person, that they are more likely to reciprocate trust and loyalty towards those people. Participants were then provided space for reflection and invited to consider how they currently lead safety within their workgroup and if there were actions from the workshop that they would look to implement within their own leadership practice.

The Participant Workbooks contained space for written reflection/ideas, as well as prompts for consideration:

- What actions or steps can you take to build [psychological] safety within your team?
- What actions or steps can you take to build connection and trusting cooperation through vulnerability?
- What actions or steps can you take to share stories and establish purpose towards a future ideal?
- What actions or steps can you take to demonstrate care and empathy for your team?

After-Action Review Intervention

Purpose

The After-Action Review Intervention involved establishing an After-Action Review (AAR) process for implementation within the Company. The Company undertakes job safety and environmental analysis (JSEA) risk assessments before commencing work tasks, and the researcher identified the AAR process as a potential learning tool to promote the flow of knowledge within and between organisational members to prevent rework and improve safe operational performance within workgroups (Love, Ackermann, Teo & Morrison 2015). The After-Action Review Intervention aimed to improve safety performance and learning within the workgroups.

In their study on preventing rework in the construction industry, (Love et al. 2015) identified that rework could be prevented when learning and knowledge flowed within and between organisational members. It created a competitive advantage and translated to improved safety and operational efficiency performance.

Scope

Following the Leadership Intervention, where the AAR process was introduced, the researcher engaged with all workgroup leaders to guide the completion of the AAR. This was reiterated in a subsequent monthly Contact Manager's meeting. The researcher arranged to facilitate several AARs within three workgroups across the region, and the blank AAR Worksheet (refer Appendix G) was circulated to all operational leaders.

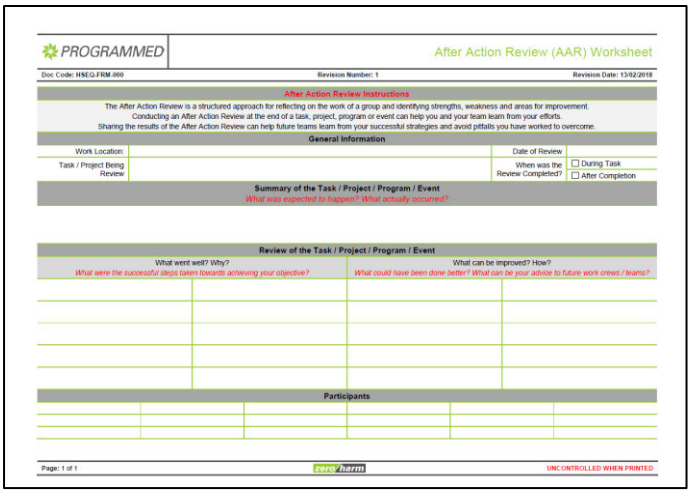
No targets for the number of AARs to be completed were set; however, the executive sponsor for the Company encouraged their completion to support safety and operational improvements within their workgroups. During monthly Contract Manager's meetings throughout the work-based project, operational leaders shared feedback on any AAR completed within their respective workgroups.

Format

The AAR process was identified as a simple tool that facilitated this learning and brought together the team to openly and honestly discuss a task, event, activity or

project (Darling, Parry & Moore 2005). AAR is the standing operating procedure for the U.S. Army and other organisations (Bolton 2016). Also known as debriefs, hot-washes, huddles, post-mortems, and retrospectives (Crowe, Allen, Scott, Harms & Yoerger 2017; Allen, Reiter-Palmon, Crowe & Scott 2018), AAR is generally completed at the worker level, as either "formal or informal discussions about what went right and what went wrong" (Allen, Baran & Scott 2010, p. 751).

The researcher developed a simple, one-page AAR Worksheet for the Company, as shown in Figure 3.6.


PROGRAMMED

After Action Review (AAR) Worksheet

Doc Code: HSEQ-FRM-000 Revision Number: 1 Revision Date: 13/02/2018

After Action Review Instructions

The After Action Review is a structured approach for reflecting on the work of a group and identifying strengths, weakness and areas for improvement.
Conducting an After Action Review at the end of a task, project, program or event can help you and your team learn from your efforts.
Sharing the results of the After Action Review can help future teams learn from your successful strategies and avoid pitfalls you have worked to overcome.

General Information

Work Location: | Date of Review:
Task / Project Being Review | When was the Review Completed? ☐ During Task ☐ After Completion

Summary of the Task / Project / Program / Event
What was expected to happen? What actually occurred?

Review of the Task / Project / Program / Event

What went well? Why? *What were the successful steps taken towards achieving your objective?*	What can be improved? How? *What could have been done better? What can be your advice to future work crews / teams?*

Participants

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Figure 3.6 After-Action Review (AAR) Worksheet
Developed for the Work-Based Project

The AAR Worksheet included guidance/prompts for completion under four key headings:

1. After-Action Review Instructions
    - The After-Action Review is a structured approach for reflecting on the work of a group and identifying strengths, weaknesses and areas for improvement.
    - Conducting an After-Action Review at the end of a task, project, program, or event can help you and your team learn from your efforts.
    - Sharing the results of the After-Action Review can help future teams learn from your successful strategies and avoid pitfalls you have worked to overcome.

2. General Information
    - Work Location.
    - Task/Project Being Reviewed.
    - Date of Review.
    - When was the Review Completed? (During Task/After Completion)
3. Summary of the Task/Project/Program/Event.
    - What was expected to happen? What actually occurred?
4. Review of the Task/Project/Program/Event
    - What went well? Why?
        - What were the successful steps taken towards achieving your objective?
    - What can be improved? How?
        - What could have been done better? What can be your advice to future work crews/teams?

Learning Team Intervention

Purpose

The Learning Team Intervention involved facilitating a series of Learning Teams within the Company to close the gap between work-as-imagined and work-as-done (Dekker 2005; Hollnagel 2014; Havinga, Dekker & Rae 2018). Learning Teams are a learning tool drawing on the operational knowledge and expertise of the workforce to improve operations by gathering valuable wisdom and insights from those doing the work (Conklin 2018). The Learning Team Intervention aimed to explore selected areas of operational concern within the Company and identify opportunities to improve the effectiveness or performance in this area.

Scope

The researcher worked with the executive sponsor of the Company to identify several possible topics to bring to a potential Learning Team. The topics included safety-related issues, as well as operational/process improvements.

Format

With a focus on eliciting worker insights on how work is *actually* done and how systems and processes can be improved, Learning Teams draw on the power of appreciative inquiry and seeks to understand and speak into the space "where the worker meets the work" (Conklin 2018, p. 75). Similarly to appreciative inquiry, Learning Teams explore "what gives life to human systems when they function at their best" (Ludema & Fry 2008, p. 282). Gantt (2017) highlights that engaging the workers who are doing the job allows them to "get a better understanding of their job tasks, as well as the opportunity to identify improvements" (Gantt 2017, p. 7) and provides them with a level of ownership over the improvements being implemented.

While Conklin (2018) argues that there is no single method for making Learning Teams happen, a seven-phase approach to Learning Teams, as depicted in Figure 3.7, was adopted as a guide for the design of Learning Teams within the work-based project. This model was overlayed on the micro- and macro- reflective cycle model (Fergusson et al. 2019b), showing both the 'macro' organisational activities and the 'micro' Learning Team activities.

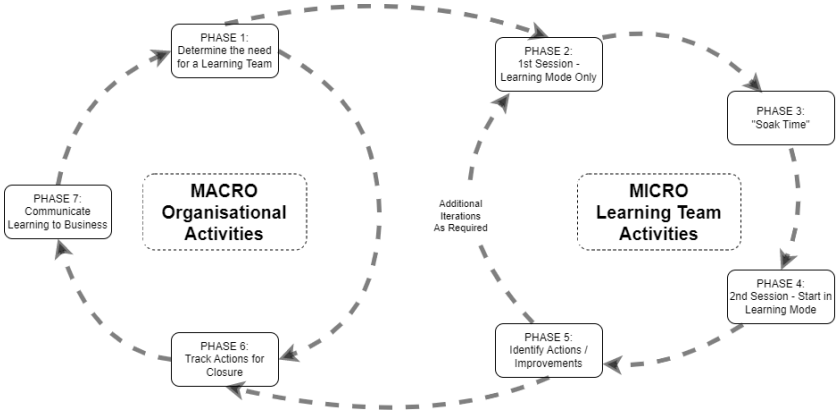

Figure 3.7 Seven Phases of the Learning Team Process

Adapted from Conklin (2018) and Fergusson et al. (2019b)

Using this seven-phase model as a guide, the researcher developed a Learning Teams presentation, provided in Figure 3.7, as a tool to facilitate groups through the Learning Team process for the identified topics within the Company.

Phases of the Learning Team

As outlined above, the Learning Team implementation was structured in seven phases. Phases 2-5 formed the main body of the Learning Team in the 'micro' cycle,

with Phases 1, 6 and 7 occurring within the broader 'macro' context of the organisation.

Phase 1: Determining the Need for a Learning Team.

The researcher worked with the executive sponsor of the Company to identify several possible topics to bring to a potential Learning Team. The topics included safety-related issues, as well as operational/process improvements. During this phase, potential Learning Team participants and workgroups were identified as relevant to the suggested topics.

Phase 2: 1st Session – Learning Mode Only.

The design of the first session of the Learning Team is about setting the goals and expectations of the process and providing a space for discovery about the topic. Participants were provided with an overview of the Learning Team process. Throughout the first session of the Learning Team, participants were reminded to stay in the learning mode and not jump into identifying solutions to any problems that were identified.

The discovery process can be explored by using timelines or chronologies of the current context and identifying conditions that are present for the outcomes to occur. The discovery process is a group brainstorming activity and can be an iterative process. Conklin (2018) reminds facilitators that everyone's view matters and to ensure that all voices are being heard in the Learning Team process.

The first session of the Learning Team closes with an intentional pause in the process, and participants are advised of the following two phases of the process, providing time to soak in the learning before returning to the second session of the Learning Team.

Phase 3: Time to Soak on the Learning.

Providing time to 'soak' on what has been discovered is essential in the learning process because learning is "complicated and messy" (Conklin 2018, p. 97). Time and space between sessions allow participants to continue thinking, reorganising their thoughts and allowing for additional information or afterthoughts to occur. The

amount of time between the first and second session of the Learning Team is fluid and can range from one day to a week.

Phase 4: 2nd Session – Starting in Learning Mode.

The second session of the Learning Team moves participants into solution mode; however, it picks back up in learning mode to review and recap the first session and for any additional learning and discovery from the soak time to be captured back in the Learning Team. The second session of the Learning Team continues, into Phase 5, by shifting from learning mode towards identifying and prioritising actions and improvement opportunities.

Phase 5: Identifying Actions and Improvement Opportunities.

The remaining time in the second session of the Learning Team focuses on identifying actions and improvement opportunities. Action areas will be prioritised, and improvement opportunities identified, including introducing or replacing defences or controls or formalising ad hoc processes already in place to share these across the business.

While not everything identified in the second session of the Learning Team requires changing, participants were asked what small changes could be worked on right away to continue building momentum from the Learning Team process.

Phase 6: Tracking Actions for Closure.

After completing the Learning Team sessions, the actions identified by participants were collated and allocated to action owners. Some were allocated to the researcher as the subject matter expert for the Company; however, several actions were redirected to other leaders within the business. Action tracking was managed through the Company's change management processes.

Phase 7: Communicating Learning back into the Business.

A summary report of the Learning Team outcomes was prepared for the Company, and the implementation of the completed actions was reported back to the business through the standing Monthly Contract Manager's meetings.

3.5 PHASE ONE – QUANTITATIVE DATA COLLECTION AND ANALYSIS

This phase of the study had two separate survey instruments [Neider and Schriesheim (2011) Authentic Leadership Inventory (ALI) and Kines et al. (2011) Nordic Safety Climate Questionnaire (NOSACQ-50)] deployed within the workplace, providing a Pre- and Post-Intervention dataset for analysis as described in Section 3.5.3. Full details of the design, development and delivery of the survey instruments are detailed in Section 3.5.1.

Company records were interrogated for safety performance metrics and grouped into the three areas of safety compliance, safety participation and occupational injury metrics as per Griffin and Neal (2000); Hon et al. (2013). Safety performance metrics identified in the company records include Incidents, Near Misses, Hazards, Worksite Reviews, Safety Conversations and Injury reports. Full details of the safety performance metrics are detailed in Section 3.5.2.

3.5.1 Survey Design, Development and Delivery

It is broadly considered appropriate to use survey questionnaires as a primary method for collecting information from large numbers of respondents within a sample population to make claims about that population (Creswell 2014). Therefore, the survey questionnaire design must be thoroughly considered and executed to ensure the effective collection of data in a research study. Once a survey questionnaire is finalised and distributed, researchers do not have an opportunity to amend the questionnaire (Denscombe 2007).

The survey questionnaire was designed and implemented considering Leedy and Ormrod (2015) 12-point guideline for constructing a questionnaire.

Development of the survey

The survey questionnaire comprised of an introductory page and six sections, as per Table 3.4, below. Sections one and six were administrative and information sections. Section one provided the participant with information regarding the UniSQ Research Project, per the HREC requirements, and section six provide participants with a statement of consent and submission of the survey. Section two collects data

related to the participants' demographic information regarding their gender, role type, employment status, job level, length of service, age, and workgroup.

Sections three and four measure the participant's perceptions of safety and leadership through the integration of two established instruments, the Nordic Occupational Safety Climate Questionnaire (NOSACQ-50) (Kines et al. 2011) contains fifty questions, and the Authentic Leadership Inventory (ALI) (Neider & Schriesheim 2011) contains fourteen questions. Each of the instruments integrated into the survey questionnaire were selected due to previous studies that confirm their validity and reliability and are described in further below. No amendments to the original instruments were made.

Section five provided optional open-ended items for participants to provide feedback on any areas for improvement within the Company, specifically related to safety. The survey administered at the Post-Intervention stage also included an opportunity for participants to describe any change they have observed, if any, within the Company over the study period.

Table 3.4 Structure of the Survey Instrument

Section/Construct	# Items	Scale Response	Source
Participant Information for UniSQ Research Project			Appendix A
Demographic information	8	Single-choice selection across a range of demographic descriptors	Developed for this study
Nordic Occupational Safety Climate Questionnaire (NOSACQ-50)	50	Likert scales of 1-4 (lower score = 'description', higher score = 'description')	Kines et al. (2011)
Authentic Leadership Inventory (ALI)	14	Likert scales of 1-5 (lower score = 'description', higher score = 'description')	(Neider & Schriesheim 2011)
Open-Ended Items	3	Free-text field response from participants seeking insights on safety leadership within the Company	Developed for this study
Statement of Consent and Submission of Survey Tool			Appendix B

Nordic Occupational Safety Climate Questionnaire (NOSACQ-50)

The NOSACQ-50 instrument was developed by a team of Nordic occupational safety researchers based on organisational and safety climate theory, psychological theory, and previous international empirical research (Kines et al. 2011). The

NOSACQ-50 is a self-reported 50-item instrument across seven dimensions of safety perception using a four-point Likert scale response to each of the statement questions. Twenty-two items evaluate management policies, procedures and practices, and the remaining 28 items focus on workgroup procedures and practices. The instrument has been utilised in numerous studies establishing its reliability and validity across cultural and industry contexts (Guldenmund et al. 2013; Ha et al. 2017; Fargnoli & Lombardi 2020). This multi-level, multi-faceted instrument evaluates worker perceptions of seven dimensions critical to organisational safety, with a good level of reliability across each of the seen dimensions (Cronbach's alpha of at least 0.79 for each factor).

Kines et al. (2011) have developed guidelines for completing the NOSCAQ-50 questionnaire and analysing and interpreting the results. Researchers are further encouraged to submit the results of their studies to an international database to further the opportunity to compare results. The raw data for the current study was entered in SPSS, with scores for 23 items reversed as per the instructions from the instrument guidelines. The mean score for each dimension was then calculated for each respondent, and the 'mean of the mean' calculated for each dimension was then derived. These means were then compared within and between each group as outlined in Section 3.6.3.

Authentic Leadership Inventory (ALI)

The ALI is a 14-item measure of authentic leadership, with four factors: self-awareness, relational transparency, balanced processing, and internalised moral perspective (Neider & Schriesheim 2011). The ALI is a self-reported instrument using a five-point Likert scale response to each statement question. Three items evaluate each of the self-awareness and relational transparency factors, and four items evaluate each of the balanced processing and internal moral perspective factors. The instrument has been utilised in various studies establishing its reliability and validity (Coxen, Van der Vaart & Stander 2016; Fusco, O'Riordan & Palmer 2016; Davidson, Mitchell, Beverly, Brown, Rettiganti, Walden & Wright 2018). The ALI instrument provides acceptable reliability across each of the four factors (Cronbach's alpha of at least 0.70 for each factor).

For the current study, the raw data was entered in SPSS. Unlike the NOSACQ-50 instrument, no items required their scores to be reversed. The mean score for each factor was then calculated for each respondent, and the 'mean of the mean' was derived for each factor. These means were then compared within and between each group as outlined in Section 3.6.3.

Validity and reliability of the survey questionnaire instruments

Developing a good survey questionnaire requires validity and reliability for it to accurately and consistently measure the underlying constructs it reports to measure. Validity and reliability are the two central qualities related to measurement (Clark & Watson 2019). Before progressing in the survey questionnaire development, validity and reliability needed to be assessed. This section will briefly define the different forms of validity and reliability and describe the steps taken in the survey questionnaire design to test for and ensure high levels of validity and reliability in the study.

All the scales integrated into the survey questionnaire were previously assessed as valid and reliable. Table 3.5 illustrates the conclusions related to validity and reliability testing reported in previously published peer-reviewed articles.

Table 3.5 Summary of Validity and Reliability of Incorporated Instruments

Questionnaire	Previous Research Findings	Source
Nordic Occupational Safety Climate Questionnaire (NOSACQ-50)	53.4% of variance explained. Factor loading between 0.409-0.767 (Yousefi, Jahangiri, Choobineh, Tabatabaei, Keshavarzi, Shams & Mohammadi 2016). Cronbach's α disclosed between 0.585-0.942 (Yousefi et al. 2016) and 0.77-0.85 (Ha et al. 2017). Reliability and construct validity evidence presented across numerous studies.	Yousefi et al. (2016); Ha et al. (2017); Fargnoli and Lombardi (2020)
Authentic Leadership Inventory (ALI)	Factor loading ranged from 0.635-0.896 (Novaes, Ferreira & Gabado-Martins 2019) and 0.73-0.96 (Davidson et al. 2018). Cronbach's α disclosed between 0.81-0.96 (Novaes et al. 2019) and 0.76-0.90 (Davidson et al. 2018). Reliability and construct validity evidence presented.	Davidson et al. (2018); Novaes et al. (2019)

Face validity is the degree to which others judge the survey instrument measures the concepts intended, and content validity is the extent to which the measure reflects the whole meaning of the content domain (Leedy & Ormrod 2015). The face validity and content validity established in prior studies were examined for both survey instruments supporting the use of these in the survey questionnaire for the present study. No amendments to the original instruments were made in the development of the questionnaire to maintain face and content validity.

Convergent and discriminant validities are two characteristics of construct validity (Krabbe 2017). Convergent validity is the extent to which scales correlate with other scales of the same construct, and discriminant validity is the extent to which scales do not correlate with unrelated ones (Hair et al. 2006; Krabbe 2017). This study has argued that authentic leadership and safety perception are overlapping yet distinct concepts. Therefore, it was expected that the scales used to operationalise these concepts would correlate in terms of the theory linking them. Convergent validity is demonstrated when the data statistically indicates higher correlations indicating that the scales measure their intended concepts (Hair et al. 2006). This analysis and reported results are described in Chapter 4.

The reliability of a scale is determined by the consistency of the scale items over time (Leedy & Ormrod 2015). Reliability is commonly determined in terms of the internal consistency of the scales (Salkind 2017) or how well the items correlate within the scale (Hair et al. 2006). Another form of reliability is the test-retest approach, which is the extent that a test yields the same result on two occasions from the same people (Leedy & Ormrod 2015). The present study will primarily be concerned with the internal consistency of the scales as determined in terms of the reliability coefficient and Cronbach's alpha (Hair et al. 2006; Leedy & Ormrod 2015; Salkind 2017). The Cronbach's alpha (α) scores of the scales included in the survey questionnaire, as established in earlier studies, were noted in Table 3.5, indicating the reliability of the scales. Reliability was an important consideration in the design of the questionnaire, and the internal consistency of the survey instrument was derived for the results of the current study and these are addressed in Chapter 4.

Survey administration

It was determined that the administration of the survey questionnaire was to be web-based due to its cost-effectiveness, ease of administration, standardisation of responses, and higher response rates (Denscombe 2007). To maximise the response rate for the completion of the survey questionnaire, the researcher implemented a multi-phase survey administration procedure over four weeks, based on Creswell (2012): 1) pre-notification to participants, 2) initial survey invitation, 3) a first reminder, 4) a second reminder, and 5) a final reminder. The reminder emails were administered through Qualtrics, ensuring that reminder emails were only sent to non-respondents. Each email address loaded within the system was allocated a unique survey link, preventing multiple responses from the same email address. A full copy of the email invitation is attached as Appendix C.

The survey questionnaire, Appendix D, was constructed and administered within the online survey service, Qualtrics. This service provides a software and database service for the administration of surveys. Responses are automatically coded, and data stored by the service and includes descriptive reports, including details of surveys viewed, dropouts and completions, in addition to a data storage and export service. Qualtrics provides for effective exporting of the data to SPSS for analysis.

Survey response

The survey was administered online using email invitations and a unique web link to a Qualtrics survey URL to everyone within the Company. The survey responses are summarised in Table 3.6 and illustrate the actual response rates for the study across the two survey years. Each year's survey response rate difference reflects changes in the workgroups across the study period and may impact the survey results. However, it was assumed by the researcher that the groupings across each survey year show homogeneity. This assumption was tested in the analysis in Chapter 4.

Table 3.6 Survey response rates

Survey Year	Survey Distribution	Total Responses (Response Rate)
2017	285	156 (54.7%)
2018	268	155 (57.8%)

3.5.2 Safety Performance Metrics

For the purposes of the study, secondary data in the form of safety performance metrics were collected in addition to the survey data. The Company collects safety performance metrics via their safety event reporting system, Noggin OCA. Company records were interrogated for safety performance metrics and grouped into the three areas of safety compliance, safety participation and occupational injury metrics as per Griffin and Neal (2000); Hon et al. (2013). These safety performance measures primarily focused on self-reported responses from survey participants, which carry potential problems associated with response bias and social desirability bias (Zikmund et al. 2013). This limitation is discussed in more detail in Section 3.7. Safety performance metrics were identified in the Company's company records and grouped into the three safety performance areas, as presented in Table 3.7.

Table 3.7 Breakdown of Safety Performance Metrics Recorded

Safety Compliance	Safety Participation	Occupational Injuries
Worksite Reviews (WSR)	WSR Contributors	Total Recordable Injuries Reported
Incidents Reported	Hazard Report Contributors	All Injuries Reported
Near Misses Reported	Safety Conversations Recorded	
Hazards Reported	Safety Conversation Contributors	

Safety performance metrics were collected for the 2017 and 2018 calendar years, aligning with the Pre- and Post-Intervention Data Collection periods and grouped by the workgroups. Safety performance records were extracted from Noggin OCA to Excel spreadsheets for translation into SPSS for analysis detailed in Section 3.5.3.

3.5.3 Quantitative Data Analysis

The study's primary purpose was to explore the relationships between authentic leadership, safety climate, and safety performance. The statistical analysis software SPSS was used to analyse the data. This section discusses the steps to identify missing and inconsistent data, then develop summary statistics, followed by the methodological and statistical justification for using Exploratory Factor Analysis (EFA) and Analysis of Variation (ANOVA).

Extracting the Data

Responses to the survey instruments were collected online through Qualtrics. Using the online survey data management system allowed the researcher to collect all data electronically, which was then extracted as an Excel file for uploading into SPSS. Once available in SPSS, the Hair et al. (2006's) data cleansing recommendations were followed, including checking for data inconsistencies and missing data fields. This was then followed by testing the assumptions of multivariate analysis.

Quantitative Data Analysis

Respondent Profiles

Demographic characteristics of participants were extracted for both the Pre- and Post-Intervention data collection points as descriptive statistics. This allowed the researcher to assess the suitability for further multivariate analysis (Hair et al. 2006) and give a summarised overview of the dataset. The descriptive statistics within the respondent profiles were then carried over to the EFA, allowing the exploration of correlations between variables to be performed to understand what relationships exist between the variables.

Instrument Analysis (NOSACQ-50 / ALI)

Descriptive statistics were extracted for both the NOSACQ-50 and ALI survey instruments. Similarly to the demographic characteristics of the survey respondents, this provided the researcher with an initial summary of the instruments' responses and the ability to assess the suitability for further multivariate analysis (Hair et al. 2006). Factor analysis was then undertaken on both the survey instruments.

Factor analysis is a multivariate analysis method that can be used to construct and validate survey instruments (Yong & Pearce 2013). For the purposes of this study, factor analysis will assist in comparing the findings of the original development of the instruments in the context of this study (Hair et al. 2006; Osborne, Costello & Kellow 2008; Watkins 2018).

Following a review of the various extraction methods available, the Maximum Likelihood (ML) has been selected due to the chi-square statistic that it can generate, determining whether the covariances generated by the parameter estimates are significantly different to the empirical sample variances and covariances (Watkins

2018). Osborne et al. (2008) recommend using ML to yield the best results when data are relatively normally distributed. The data were screened for normality and, as such, met the assumption required for ML. Eigenvalues greater than one (Hair et al. 2006) and scree plots were used to determine the number of extracted factors. The Varimax orthogonal rotation was chosen to achieve a meaningful and straightforward factor structure outcome, as the factors were not expected to correlate (Hooper 2012).

Analysis of Variation (NOSACQ-50 / ALI)

Inferential statistical analysis enables the researcher to draw inferences or conclusions about populations from the sample data (Leedy & Ormrod 2015). Using samples to conclude populations is open to error, and inferential statistics provide a reliable way of interpreting data in this context (Leedy & Ormrod 2015). Analysis of Variation (ANOVA) is a technique that can be used to compare the differences between the means of groups and establish whether the difference, if present, is statistically significant or not (Holton & Burnett 2005). ANOVA will be conducted on each instrument against the independent variables of the respondent profiles. This will explore the moderating effect of demographic factors (such as gender, length of service and age) on the Pre- and Post-Intervention authentic leadership and safety climate factors, respectively.

Relationship between the Variables

Correlations

Bivariate correlational analysis between all variables of the survey instrument was calculated using Pearson's product-moment correlation. While the correlational analysis cannot be used to conclude a cause-effect relationship, it is useful to describe the nature and magnitude of any relationships observed between two variables (Salkind 2010). The results of the correlational analysis for the current study are addressed in Chapter 4.

ANOVA between Years

ANOVA will again be conducted on each instrument to assess the change, if any, between the Pre- and Post-Intervention responses to the authentic leadership and safety perception factors, respectively.

Safety Performance

Summary Statistics

Summary statistics of the Company's safety performance metrics were extracted for both the Pre- and Post-Intervention data collection within the categories of Safety Compliance, Safety Participation and Occupational Injuries. Similarly to the demographic characteristics of the survey respondents, this provided the researcher with an initial summary of the safety performance data and the ability to assess the suitability for further analysis (Hair et al. 2006).

Correlations

Correlational analysis was undertaken on the workgroup's Pre- and Post-Intervention safety performance metrics. The ALI and NOSACQ-50 factors for each workgroup were included in the analysis to compare any observed relationship between these factors and the safety performance metrics. The results of the correlational analysis for the current study are addressed in Chapter 4.

Variance Between Years

Safety performance metrics often take the form of count data, which regularly occurs across social sciences (Nussbaum, Elsadat & Khago 2008). Count data are often highly skewed, have a lower bound of zero, and have a finite number of observations. Count data does not fit a normal distribution (Lewis-Beck, Bryman & Liao 2004) and are more appropriately analysed using a Poisson method instead of more traditional methods such as regression, ANOVA or t-test (Nussbaum et al. 2008). Poisson analysis methods are popularly used to describe various sporadic or infrequent events, such as numbers of accidents, epidemiological studies, and patterns in queuing systems (Salkind 2007).

There are situations, like in the current study, where two assumptions of the Poisson distribution are violated, namely, the independence of the data and the data being identically distributed (Lewis-Beck et al. 2004). In such cases, the negative binomial distribution relaxes these assumptions, allowing for regression analysis to be undertaken on the count data where the research believes the observations may not be truly independent or constantly occurring (Lewis-Beck et al. 2004).

A negative binomial regression was undertaken on the safety performance metrics in SPSS using the Generalised Linear Model as recommended by Kremelberg (2011) to assess the change between the Pre-Intervention and Post-Intervention data collection periods. The ALI and NOSACQ-50 factors were included in the analysis to determine any moderative effect of these factors and the safety performance metrics. The results of the negative binomial analysis for the current study are addressed in Chapter 4.

3.6 PHASE TWO – QUALITATIVE DATA COLLECTION

Qualitative data collection was emphasised in the final stages of the present study to allow for further exploration and potential triangulation of trends observed from responses to the quantitative items of the survey questionnaire (Johnson & Onwuegbuzie 2004; Creswell 2014). Qualitative data were collected via open-ended survey items in the Pre-Intervention and Post-Intervention questionnaires, follow up focus group interviews conducted approximately ten weeks after the Post-Intervention survey closed, and interviews with key stakeholders of the Company.

3.6.1 Focus Group Interviews

The focus group interviews allowed for a qualitative exploration of the results from the surveys and captured the "attitudes and perceptions, feelings and ideas" of the focus group participants (Denscombe 2007, p. 178). Focus groups have three distinct elements, as described by Denscombe (2007), which provide the qualitative outcomes for the present study:

1. A key focus trigged by a stimulus
2. Interaction within the group to elicit information
3. The researcher facilitates (not leading) the group interactions

Items used in these focus group interviews included summary demographic information and preliminary results of the ALI and NOSACQ-50 survey instruments from de-identified workgroups. The items focused on participants' views on the safety leadership within the Company and any relationship between authentic leadership, safety climate, and safety performance; however, participants were

encouraged to elaborate and contribute any views they felt were relevant. The focus group interview prompts are outlined in Table 3.8.

Table 3.8 Focus group interview prompts

Focus Item	Questions / Prompts
Demographic summary	Is there anything that stands out from the organisation's demographic?
	Prompt various demographic groupings – years of service, age, gender, full-time/part-time, workgroup, manager/supervisor, admin/trades.
2017 and 2018 summary ALI/NOSACQ-50 results	Safety climate – seven dimensions.
	Authentic leadership – four dimensions.
	Example of NOSACQ-50 questions: *"My manager looks for a root cause rather than blaming a worker with an incident."*
	Example of ALI questions: *"My manager listens carefully to other opinions/perspectives before reaching conclusions."*
Participant attitudes and perceptions, feelings and ideas	What does safety leadership mean to you?
	Has there been any change in safety leadership/performance within the organisation?
	Are there other thoughts, comments that you want to share, or other questions I haven't asked that you wanted me to ask?

Focus group interviews were conducted approximately ten weeks after the conclusion of the Post-Intervention survey, with participation from 17 individuals purposively selected across three workgroups. Participants were provided consent and demographic collection forms before commencing the focus group. The focus group interviews were scheduled for between 30 and 60 minutes, and recorded for subsequent transcription and analysis. The focus group interviews aimed to gain participants' reflection on the study and gather insights and perspectives to carry through to the key informant interviews. Transcriptions of the focus group interviews are attached in Appendix L.

3.6.2 Key Stakeholder Interviews

In addition to the focus groups, semi-structured interviews were conducted with five key stakeholders from various workgroup and organisational roles across the Company. The use of a semi-structured format allowed the researcher to focus on key questions to be answered, with the flexibility to develop ideas and provide space for the interviewee to elaborate on areas of interest (Denscombe 2007). The semi-structured interviews were informed by the focus group responses, with

different lines of enquiry identified and questions formulated to be added to the initial key stakeholder interview prompts outlined in Table 3.9.

Table 3.9 Initial key stakeholder interview prompts

Topic	Questions / Prompts
Role	Can you describe for me your role?
	How long have you been doing this type of work?
Safety Leadership	How would you describe the Safety Leadership on this contract/business?
	What does it mean to you to be a Safety Leader in the business?
	How is Safety Leadership demonstrated at this contract/business? How do you demonstrate Safety Leadership?
	Phrases/words elicited from Safety Survey and Focus Group Interviews.
Authentic Safety Leadership Workshop	Thinking about the ASL Workshop, was there anything that stood out or resonated with you? Why?
	How have you demonstrated authentic safety leadership?
	Have you seen any change in your follower's safety behaviours as a result of these actions?
After-Action Reviews/Learning Teams	Have you been involved in any After-Action Review/Learning Team processes? How many?
	From your perspective, what were your learnings from being part of the After-Action Review/Learning Team?
	How will/have you shared the learnings and insights identified through the After-Action Review/Learning Team Process?
	Have any changes been implemented in the business as a result of an After-Action Review/Learning Team?
	Can you describe management's support for implementing After-Action Reviews/Learning Team in your workgroup?

Key stakeholder interviews were conducted within four weeks of the focus group interviews. Five individuals were purposively selected across five workgroups to participate and did not include individuals involved in the focus group. Participants were provided consent and demographic collection forms before commencing the interview. The key stakeholder interviews were scheduled for between 30 and 60 minutes, and were recorded for subsequent transcription and analysis. Transcriptions of the key stakeholder interviews are attached in Appendix L.

3.6.3 Qualitative Data Analysis

Denscombe (2007) set out four principles for qualitative data analysis: 1) analysis and conclusions should be firmed grounded in the data, 2) explanation should emerge from the reading of the data, 3) introducing unwarranted preconceptions of the researcher should be avoided, and 4) the data analysis processes should be iterative. This section outlines the preparation and extraction of the qualitative data and the process undertaken to analyse and interpret the data.

Extracting the Data

The qualitative data analysis began with the transcription of the audio files of the Focus Group Interviews and Key Informant Interviews. Audio files were uploaded to Sonix.ai, a web-based automated transcription software, providing highly accurate, timestamped interviews. Once processed, the researcher completed final quality checks of the transcriptions using the in-browser word processor and embedded timestamped audio. While the transcription was semi-automated using the Sonix.ai transcription software, the research maintained involvement in the process to ensure deep familiarity with the data, as recommended by Denscombe (2007). Transcriptions of the interviews are attached in Appendix L.

Analysis of Themes

Once all interviews were available in transcribed formats, the analysis of these items involved coding and quantifying the results using ATLAS.ti, a web-based qualitative data analysis software that supports inductive and non-hierarchical analysis and allowed researchers to visualise their analysis through the process (Paulus & Lester 2016). Extracting meaning from transcribed interview data requires a structured approach. A six-step process for thematic analysis was followed to identify the emerging themes from the qualitative data illustrated in Figure 3.8.

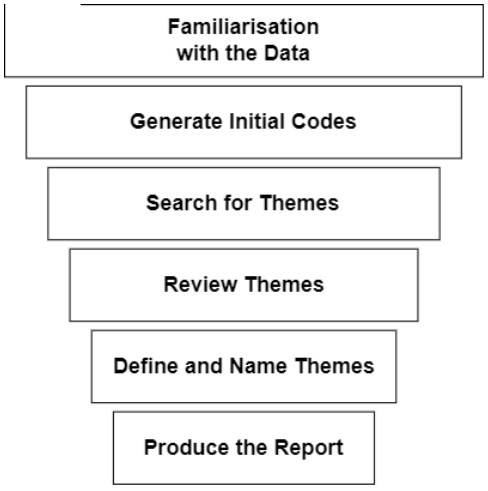

Figure 3.8 Steps of Thematic Analysis

Adapted from Braun and Clarke (2006)

The researcher was involved in all phases of the data collection and thematic analysis, ensuring an immersion in the data and at each step of the process outlined. The themes emerging from the qualitative data analysis are highlighted in Chapter 5.

3.7 LIMITATIONS OF THE RESEARCH DESIGN

The study offers several significant findings to the literature. While efforts have been made to ensure the present study balances methodological rigour and statistical requirements, this section discusses the limitations of the research design and strategy. It also shows how these limitations were partly overcome. Every research strategy has its advantages and disadvantages, and the most appropriate strategy should be applied to address the research question (Malina, Nørreklit & Selto 2011).

Under the pragmatist worldview, the research questions are considered central to the investigation and methods to elicit valuable insight. As a result, all four phases of the present study (Pre-Intervention data collection, work-based project, and Post-Intervention data collection and analysis) provided a positive contribution, academically and practically. The research was based on an explanatory mixed-method design. The study's primary purpose is to explain the nature of the possible relationships between authentic leadership, safety climate, and safety performance.

Authentic leadership is a relatively new leadership theory (Divya & Suganthi 2017). It has gained momentum, especially in the past decade and with the increasing reports of immoral and unethical behaviour of organisational leaders (Hannah, Avolio & Walumbwa 2011; Liu, S.-m., Liao & Wei 2015; Lyubovnikova, Legood, Turner & Mamakouka 2017). However, the overall study of the relationship between authentic leadership, safety climate and safety performance lacks theoretical underpinnings. As the present study is not theoretically driven and without theoretical underpinning to inform the interpretation of results, the researcher determined a level of subjectivity. This concern is partially mitigated by the pragmatist worldview, which holds the research problem as the central consideration from which data collection and analysis is undertaken (Mackenzie & Knipe 2006).

It was noted that the NOSACQ-50 instrument utilises a 4-point Likert scale (Kines et al. 2011), while the ALI instrument uses a 5-point Likert scale (Neider & Schriesheim 2011). The use of even number of response categories creates a force-response in either the positive or negative, and removed the neutral option for the respondent. The removal of a neutral option can increase the presence of

acquiescence bias (Pimentel 2019), while reduce the potential of central tendency bias which may be present in odd-numbered Likert scales (Pimentel 2010). For the purposes of this study, the original structure of each of the instruments were retained to minimise impact on their previously reported reliability and validity.

The use of mixed methods in the present study provided "a balance between subjectivity and objectivity" (Doyle et al. 2016, p. 265) and contributed to the depth and breadth of research outcomes. However, the results were limited by the explanatory design and purposive sampling strategy. The ability to generalise findings and conclude a cause-effect relationship is restricted due to the anticipated homogeneity of the sample population of the Company (Leedy & Ormrod 2015). While the behaviours displayed by leaders of the Company and the respondent's perceptions of safety climate are considered homogenous, the findings cannot be generalised beyond the Company. Further studies investigating the generalisability of the findings are required to address this limitation.

Further limitations identified relating to the Company in the present study were the inability to control for organisational change, the commencement/expiry of contracts with clients, or the impact that workgroups in different industry settings may have different attitudes to risk (Pilbeam et al. 2016). A further limitation is the lack of gender diversity and the ratio of field-related workers versus administration and office-based roles in responses to the Pre-Intervention and Post-Intervention data collection points.

EFA is primarily criticised for producing sub-optimal outcomes if poorly implemented, and the results of EFA are subjectively determined by the researcher (Williams, Onsman & Brown 2010; Watkins 2018). As EFA has "few absolute guidelines" (Osborne et al. 2008, p. 86), including the choice of rotation and factors to retain, researchers must pragmatically make decisions in an attempt to achieve the best outcomes for the analysis (Watkins 2018). From a rotation perspective, the use of oblique rotation methods can present the risk of being sample-specific and lacking generalisability, which has already been identified as a limitation of the present study (Hair et al. 2006). Therefore, the researcher implemented review

processes throughout the study, with supervisor input, to reduce the bias associated with this limitation.

A common area of concern of survey instruments is their reliance on self-report data, with problems associated with response and social desirability biases (Zikmund et al. 2013). The results of the ALI and NOSACQ-50 survey instruments were triangulated against the focus group and Key Stakeholder Interviews to establish a level of reliability. However, Leedy and Ormrod (2015) note that the complete impact of bias resulting from self-reported data cannot be eliminated, and the use of 360° feedback questionnaires and additional qualitative measures may provide better opportunities to address this limitation further.

Previous studies focusing on safety performance utilised survey self-reported responses from participants linked to three areas of safety performance: safety compliance, safety participation, and occupational injury (Griffin & Neal 2000; Hon et al. 2013). To reduce the bias associated with self-reported safety compliance, participation and involvement in occupational injuries, safety performance metrics were sourced from the Company's records and grouped into the three safety performance areas.

3.8 RESEARCH ETHICS

Researchers must consider and anticipate ethical issues that may arise while undertaking their research studies (Creswell 2014). A researcher's commitment to conduct their studies ethically helps maintain the integrity of the research processes and provides necessary protection to the participants and the researcher (Denscombe 2007). The University of Southern Queensland (UniSQ) places a strong emphasis on promoting ethical conduct.

The UniSQ Human Research Ethics Committee (HREC) has established strong ethical guidelines for researchers to conduct their studies according to the National Statement on Ethical Conduct in Human Research (NHMRC 2007). The HREC reviews research proposals and ethics approval must be granted before commencement. Human Ethics Research Approval was applied for and granted on 22 June 2017 and

was valid until expiry on 22 June 2020 (see Appendix E). The HREC also required the submission of Ethics Progress Reports at regular intervals.

As a Certified Chartered Generalist OHS Professional, the researcher is expected to follow the Australian Institute of Health and Safety Code of Ethics (AIHS n.d.) which articulates and promotes the prevention of harm, the promotion of safety and health, and the application of ethical values in the conduct of health and safety work. The AIHS Code of Ethics is underpinned by a commitment to uphold the values of integrity, objectivity, impartiality, professional competence, professional behaviour, and confidentiality and disclosure. A decision-making process supports the Code of Ethics to guide professionals in working through ethical dilemmas within the AIHS Core Body of Knowledge (AIHS 2019b).

The current study meets the definition of human research by the National Statement on Ethical Conduct in Human Research (NHMRC 2007), given that it involves participants taking part in surveys and involvement in focus groups and interviews. Although the current research is considered low risk, based on the kind of harm, level of harm, and the likelihood of harm to participants, the researcher must anticipate any relevant ethical dimensions to ensure these are suitably addressed (Creswell 2014).

Ethical considerations related to voluntary participation, anonymity, confidentiality, deception and accuracy of reporting (Zikmund et al. 2013). All participants were advised of the purpose of the research, anonymity (and the measures taken to assure this), the opportunity to withdraw at any time, the confidentiality of responses, and the opportunity to express concerns through the invitation to participate and in both the consent and information forms. The researcher's contact details were indicated on all forms of communication, including the UniSQ HREC contact details. No concerns were received throughout the project.

3.9 CONCLUSION

This chapter described the research design, philosophical worldview and strategy adopted for this study. Specifically, it described the research methodology

and stages used to collect the data, the statistical analysis method, its limitations and the ethical considerations ascribed throughout the study.

The next chapter presents the findings of the data collected and proposes interpretations in relation to the research objectives.

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CHAPTER 4 QUANTITATIVE RESULTS & DISCUSSION

4.1 INTRODUCTION

The previous chapter described the research design and methodology adopted for the present study to collect data. This chapter describes how the quantitative data was prepared and analysed to partially address the study's research questions. The results reported in this chapter will then be discussed as they relate to the research problem. The structure of this chapter is shown in Table 4.1.

Table 4.1 Structure of Chapter 4

Section	Content	
4.1	Introduction	
4.2	Quantitative Results: Pre-Intervention	Data Preparation Respondent Profiles Authentic Leadership Inventory NOSACQ-50 Safety Climate Questionnaire Safety Performance Relationship Between Variables
4.3	Quantitative Results: Post-Intervention	Data Preparation Respondent Profiles Authentic Leadership Inventory NOSACQ-50 Safety Climate Questionnaire Safety Performance Relationship Between Variables
4.4	Pre- and Post-Intervention Changes	Authentic Leadership Inventory NOSACQ-50 Safety Climate Questionnaire Safety Performance Relationship Between Variables
4.5	Conclusion	

Full SPSS Outputs are available in Appendix I (Exploratory Factor Analysis), Appendix J (Analysis of Variation), and Appendix K (Poisson Regressions).

4.2 QUANTITATIVE RESULTS: PRE-INTERVENTION

4.2.1 Data Preparation

The study's data required processing to convert the data collected into a format suitable for answering the study's research questions (Zikmund et al. 2013). The primary data range was confirmed to be suitable for further analysis by following the data cleaning and screening recommendations of Creswell (2014) and Hair et al.

(2006); firstly, checking for inconsistencies in the data and examining any missing data.

Response Rates

The survey was administered according to the methodology outlined in Chapter 3. The sampling strategy included purposive, convenience, and nonprobability techniques, with the invitation to participate in the survey extended to all employees of the Company. This sampling effort resulted in 178 responses commencing the Pre-Intervention survey. After data preparation, 156 (87.64%) valid responses were retained for further analysis after invalid responses were removed for not meeting the predetermined criteria for missing data.

The Pre-Intervention sample size of 156 equated to >50% of the total sample population of the Company. The sample size was deemed sufficient for the explanatory nature of the present study.

Missing data

While missing data "are a fact of life in multivariate analysis" (Hair et al. 2006, p. 49) it is critical that the researcher address the issues affecting the interpretation and extrapolation of the results (Hair et al. 2006). Hair et al. (2006) recommend a four-step process for identifying and managing missing data before statistical analysis, reducing the risk of sample size reduction and minimising the risk of biased results. These steps include defining the type of missing data, establishing the extent of missing data, assessing the randomness of missing data, and choosing the method of imputing the missing data.

Following the four-step process outlined by Hair et al. (2006) the survey set included missing data that was not ignorable. These missing data were not random, were easily identifiable by the researcher, and were associated with the respondents failing to complete the survey. The missing data within cases was extensive and considered high enough to affect the analysis without action. The most efficient remedy method was to delete these incomplete responses with missing data (Hair et al. 2006). Failure to complete the entire instrument embedded in the survey meant failure to assess safety climate or authentic leadership concepts for these cases. Therefore, it was unnecessary to continue with steps three and four of Hair et al.

(2006) – assessing the randomness of missing data and choosing the method of imputing the missing data.

Twenty-two individual invalid responses were eliminated from the Pre-Intervention survey dataset following this process, and no replacement of missing values was conducted. The remaining Pre-Intervention responses with no missing data and suitable for analysis was 156.

Outliers

Outliers are "observations with a unique combination of characteristics identifiable as distinctly different from other observations" (Hair et al. 2006, p. 73). While extreme responses can influence the outcome of EFA (Hair et al. 2006), outliers should also be considered within the context of the present study and the choice of statistical analysis. Where outliers can interfere with multivariate analysis, Hair et al. (2006) recommend managing them accordingly. No outliers were identified in the current dataset.

Univariate analysis was undertaken to assess for potential outliers. The univariate analysis is used to identify any unique or extreme observations. Responses falling outside the range of 2.5 to 4 standard deviations from the mean indicate the detection of an outlier (Hair et al. 2006). No univariate outliers were detected following a review of the standard deviations.

Normality

Normality of data is the "degree to which the distribution of the sample data corresponds to a normal distribution" (Hair et al. 2006, p. 36). For the study, normality was assessed using both graphical (boxplots, histograms, P-P Plots) and statistical assessment (Kolmogorov-Smirnov, Shapiro-Wilks tests). Measures of skewness and kurtosis were also assessed to determine any possible impacts due to the distribution shape.

As a reference for substantial departure from normality, this study used the criteria for univariate non-normality of >|3.0| Skewness and >|8.0| Kurtosis (Kline 2016) as a guide. Based on these criteria, all items were regarded as not representing

a substantial departure from normality and not requiring further remedy for non-normality.

4.2.2 Respondent Profiles

Demographic characteristics of the survey respondents were collected and extracted from the questionnaire. Descriptive statistics of the respondent profiles assist the researcher with identifying suitability or further multivariate analysis (Hair et al. 2006) and provide the researcher with a richer and deeper understanding of the sample.

In total, 156 Pre-Intervention responses were included in the analysis. The demographic information in the online survey covered: gender, age, role type, employment status, tenure, whether they identified as a people leader (and subsequently their leadership position), and their workgroup. Table 4.2 provides an overview of the Pre-Intervention sample respondent profiles.

Table 4.2 Frequency of Pre-Intervention Respondent Profiles

		Frequency	Valid Percent	Cumulative Percent
Gender	Male	115	73.7	73.7
	Female	36	23.1	96.8
	Prefer not to answer	5	3.2	100.0
	Total	156	100.0	
Age	21 - 30	24	15.4	15.4
	31 - 40	40	25.6	41.0
	41 - 50	47	30.1	71.2
	51 - 60	35	22.4	93.6
	61 +	10	6.4	100.0
	Total	156	100.0	
Role Type	Trades / Labour	41	26.3	26.3
	Salaried / Administration	115	73.7	100.0
	Total	156	100.0	
Employment Status	Full Time	147	94.2	94.2
	Part Time	4	2.6	96.8
	Casual / Contract	5	3.2	100.0
	Total	156	100.0	
Tenure	Less than 1 year	21	13.5	13.5
	1-2 years	27	17.3	30.8
	2-5 years	48	30.8	61.5
	5-10 years	33	21.2	82.7
	More than 10 years	27	17.3	100.0
	Total	156	100.0	
People Leader	Yes	78	50.0	50.0
	No	78	50.0	100.0
	Total	156	100.0	
Leadership Position	Executive Manager	4	5.1	5.1
	Contract / Regional Manager	13	16.7	21.8
	Operational / Functional Manager	25	32.1	53.8
	Coordinator / Supervisor	36	46.2	100.0
	Sub-Total	78	100.0	
	Non-People Leader	78		
	Total	156		

Table 4.2 (Continued)

		Frequency	Valid Percent	Cumulative Percent
Work Group	Alpha	3	1.9	1.9
	Bravo	25	16.0	17.9
	Charlie	2	1.3	19.2
	Delta	14	9.0	28.2
	Echo	15	9.6	37.8
	Foxtrot	4	2.6	40.4
	Hotel	3	1.9	42.3
	India	1	.6	42.9
	Juliet	10	6.4	49.3
	Lima	37	23.7	73.0
	Mike	6	3.8	76.8
	November	2	1.3	78.1
	Oscar	25	16.0	94.1
	Papa	2	1.3	95.4
	Quebec	5	3.2	98.6
	Romeo	2	1.3	100.0
	Total	156	100.0	

Gender and Age. The study did not purposefully target gender or age. The Pre-Intervention sample consisted of 73.7% males and 23.1% females. 3.2% of respondents preferred to identify or disclose a gender. This may support the observation that gender inequality exists within the Company, being a male-dominated, trades-based organisation. The respondents' age was normally distributed, with the average respondents (30.1%) between 41-50 years old. Those aged between 31-40 years old accounted for a further 25.6%, and those between 51-60 accounted for an additional 22.4%. Most participants (58.9%) were over 41 years of age and in the middle to advanced stages of their careers.

Role Type and Employment Status. The study did not purposefully target role type and was random. The Pre-Intervention sample consisted of 73.7% salaried/administration-based respondents and 26.3% trades/labour respondents. The split of role type was not unexpected, as the Company has a standard 65/35 split between salaried/administration and trades/labour employees. However, the lower response rate in trades/labour suggested that further targeting of frontline trades/labour-based roles could be considered for future studies. Most respondents (94.2%) reported being full-time, permanent employees of the Company, with part-time (2.6%) and casual/contract employees (3.2%) making up the balance of respondents.

Tenure. The respondents' length of service with the Company was normally distributed, with the average respondents (30.8%) employed for between 2-5 years. 38.5% of respondents had been employed with the Company for over five years.

People Leader and Leadership Position. The study did not purposefully target people leaders. 50% of the Pre-Intervention sample reported being in a people leadership role. Of these respondents, 23.1% identified as Coordinator/Supervisor, and 16.0% as Operational/Functional Managers. 8.3% of respondents identified as Contract/Regional Managers, and 2.6% were Executive Managers.

Workgroup. The study did not purposefully target workgroups and was random. The 156 respondents from the Pre-Intervention sample came from 16 workgroups across the Victoria/Tasmania regions of the Company. Workgroups were deidentified, and the contract names were replaced with phonetic alphabet identifiers. Most respondents (55.7%) came from three of the workgroups, being Lima (23.7%), Bravo (16.0%), and Oscar (16.0%).

4.2.3 Authentic Leadership Inventory

The ALI survey instrument was utilised to gain insights from the respondents on their perceptions of authentic leadership being demonstrated within the Company. The analysis of the ALI survey instrument is presented in this section, presenting the summary statistics, exploratory factor analysis and analysis of variation.

Summary Statistics of the Pre-Intervention ALI

Descriptive statistics for the four dimensions of the Pre-Intervention ALI are presented in Table 4.3. The mean scores for the four dimensions ranged from 3.73 to 3.94, and the standard deviations reported show no unexpected results.

Table 4.3 Pre-Intervention ALI Descriptive Statistics

		Statistic	Std. Error
ALI_S	Mean	3.9199	.07248
	Median	4.0000	
	Variance	.809	
	Std. Deviation	.89949	
	Skewness	-1.033	.195
	Kurtosis	1.098	.389

Table 4.4 (Continued)

		Statistic	Std. Error
ALI_R	Mean	4.0260	.07736
	Median	4.3333	
	Variance	.922	
	Std. Deviation	.96001	
	Skewness	-1.062	.195
	Kurtosis	.796	.389
ALI_B	Mean	3.8977	.07344
	Median	4.0000	
	Variance	.831	
	Std. Deviation	.91135	
	Skewness	-.869	.195
	Kurtosis	.443	.389
ALI_M	Mean	3.9416	.06567
	Median	4.0000	
	Variance	.664	
	Std. Deviation	.81489	
	Skewness	-.955	.195
	Kurtosis	1.119	.389

Exploratory Factor Analysis: Validity and Reliability of the ALI Instrument

Bartlett's test of sphericity was significant for the ALI instrument at 0.956 sampling adequacy. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy for the ALI instrument is 0.956. The Maximum Likelihood (ML) extraction converged for a four-factor model, explaining a total of 73.32% of the variance.

The Goodness of Fit Test of the four-factor model is presented in Table 4.4. Non-significant values suggest a good fitting model. With a p-value >0.05, the four-factor model is accepted.

Table 4.4 Pre-Intervention ALI Factor Analysis (ML) – 4 Factors Goodness of Fit Test

Chi-Square	df	Sig.
39.325	41	.545

Reliability analysis on the Pre-Intervention ALI instrument and its four dimensions were completed. The ALI instrument was determined to be internally consistent and reliable with a Cronbach's alpha of α = 0.960.

Discussion on the Pre-Intervention ALI EFA

Fourteen items from the ALI instrument were subjected to the ML extraction method with Orthogonal (Varimax) rotation. The initial EFA solution attempted to extract a one-factor matrix using ML, explaining 64.82% of the variance. The EFA process was re-run forcing a four-factor extraction in line with the original ALI survey

instrument. The ML extraction successfully converged on four factors and satisfactorily explained 73.32% of the variance. Reliability analysis of the full ALI instrument was sound (α = 0.960), and the four-factor model of the EFA was accepted at the goodness of fit test.

Analysis of Variation within the Pre-Intervention ALI

An analysis of variance was conducted to compare the effect of respondent demographic profiles on the mean ALI score in the Pre-Intervention Data Collection, with a summary of results presented in Table 4.5.

Table 4.5 ANOVA of Demographics with Pre-Intervention ALI

		Mean	Std. Deviation	N	F	Sig.
Gender	Male	3.9002	.89323	114	.792	.455
	Female	4.1019	.69899	36		
	Prefer not to answer	3.8594	.76383	4		
Role Type	Trades / Labour	3.7053	.97320	41	4.615	.033
	Salaried / Administration	4.0337	.78503	113		
Employment Type	Full Time	3.9351	.85341	145	1.031	.359
	Part Time	3.7240	.70267	4		
	Casual / Contract	4.4500	.76015	5		
People Leader	Yes	4.0655	.67725	76	3.001	.085
	No	3.8301	.97780	78		
Leader Role	Executive Manager	4.2240	1.06167	4	1.554	.208
	Contract / Regional Manager	4.2949	.56236	13		
	Operational / Functional Manager	4.1625	.57719	25		
	Coordinator / Supervisor	3.8879	.72059	34		
Work Group	Alpha	4.0278	.60465	3	.814	.661
	Bravo	4.0108	.98640	25		
	Charlie	4.2917	.14731	2		
	Delta	3.8527	.62224	14		
	Echo	3.6681	.94493	15		
	Foxtrot	3.8802	.30064	4		
	Hotel	3.9722	.95228	3		
	India	2.6875	.	1		
	Juliet	4.1146	.47306	10		
	Lima	4.0332	.95079	37		
	Mike	4.5417	.50997	6		
	November	4.4271	.13258	2		
	Oscar	3.8795	.90455	23		
	Papa	3.3021	.07366	2		
	Quebec	3.4000	.94550	5		
	Romeo	4.1979	.13258	2		
Length of Service	Less than 1 year	4.3075	.62378	21	1.659	.163
	1-2 years	3.9275	.75480	27		
	2-5 years	3.9235	1.02532	46		
	5-10 years	3.9798	.62854	33		
	More than 10 years	3.6821	.93876	27		
Age	21 - 30	4.1241	.64129	24	1.998	.098
	31 - 40	3.8146	1.11318	39		
	41 - 50	4.1516	.60313	47		
	51 - 60	3.8009	.90035	34		
	61 +	3.5625	.70813	10		

Discussion on the Pre-Intervention ALI ANOVA

The ANOVA of the Pre-Intervention ALI identified that only one demographic characteristic had a statistically significant effect on the mean ALI score. The effect of *Role Type* on the mean ALI score was statistically significant, [F (1,153) = 4.615, p=.033], indicating that the mean ALI score of those respondents in Salaried/Administrative roles (M=4.034; SD=0.785) is statistically higher than that of Trades/Labour roles (M=3.705; SD=0.973). This suggests that Office Workers perceive their leaders as more authentic than Trades-Based Workers.

No other demographic characteristics had a statistically significant effect on the mean ALI scores of Pre-Intervention respondents.

4.2.4 NOSACQ-50 Safety Climate Questionnaire

The NOSACQ-50 survey instrument was utilised to gain insights from the respondents on their perceptions of the Company's safety climate. The analysis of the NOSACQ-50 survey instrument is presented in this section, presenting the summary statistics, exploratory factor analysis and analysis of variation.

Summary Statistics of the Pre-Intervention NOSACQ-50

Descriptive statistics for the seven dimensions of the Pre-Intervention NOSACQ-50 are presented in Table 4.6. Mean scores for the seven dimensions ranged from 3.22 to 3.35, with a score >3.30 indicating a good level of alignment, scores 3.00-3.30 requiring slight improvement, scores 2.70-2.99 indicating a relatively low level of alignment and need of improvement, and scores <2.70 needing a great deal of improvement. The means and standard deviations reported show no unexpected results.

Table 4.6 Pre-Intervention NOSACQ-50 Descriptive Statistics

		Statistic	Std. Error
NOSACQ_Dim1	Mean	3.3505	.04409
	Median	3.4444	
	Variance	.301	
	Std. Deviation	.54890	
	Skewness	-1.031	.195
	Kurtosis	.994	.387
NOSACQ_Dim2	Mean	3.2470	.04282
	Median	3.2857	
	Variance	.284	
	Std. Deviation	.53311	
	Skewness	-.409	.195
	Kurtosis	-.076	.387

Table 4.6 (Continued)

		Statistic	Std. Error
NOSACQ_Dim3	Mean	3.2183	.04322
	Median	3.1667	
	Variance	.290	
	Std. Deviation	.53808	
	Skewness	-.678	.195
	Kurtosis	1.134	.387
NOSACQ_Dim4	Mean	3.3172	.03658
	Median	3.1667	
	Variance	.207	
	Std. Deviation	.45536	
	Skewness	.082	.195
	Kurtosis	-.890	.387
NOSACQ_Dim5	Mean	3.2461	.04034
	Median	3.2857	
	Variance	.252	
	Std. Deviation	.50219	
	Skewness	-.462	.195
	Kurtosis	.036	.387
NOSACQ_Dim6	Mean	3.3218	.03973
	Median	3.2500	
	Variance	.245	
	Std. Deviation	.49469	
	Skewness	-.230	.195
	Kurtosis	-.533	.387
NOSACQ_Dim7	Mean	3.3419	.03811
	Median	3.2857	
	Variance	.225	
	Std. Deviation	.47450	
	Skewness	-.125	.195
	Kurtosis	-.669	.387

Exploratory Factor Analysis: Validity and Reliability of the NOSACQ-50 Instrument

Bartlett's test of sphericity was significant for the NOSACQ-50 instrument at 0.926 sampling adequacy. The KMO measure of sampling adequacy for the NOSACQ-50 instrument is 0.926. The ML extraction converged for a seven-factor model, explaining a total of 59.06% of the variance.

The Goodness of Fit Test of the seven-factor extraction is presented in Table 4.7. Non-significant values suggest a good fitting model. With a *p*-value <0.05, the seven-factor model is rejected.

Table 4.7 Pre-Intervention NOSACQ-50 Factor Analysis – 7 Factors (ML) Goodness of Fit Test

Chi-Square	df	Sig.
1183.335	896	.000

Reliability analysis on the Pre-Intervention NOSACQ-50 instrument and its seven dimensions were completed. The NOSACQ-50 instrument was internally consistent and reliable with a Cronbach's alpha of $\alpha = 0.968$.

Discussion on the Pre-Intervention NOSACQ-50 EFA

Fifty items from the NOSACQ-50 instrument were subjected to the ML extraction method with Orthogonal (Varimax) rotation. The initial EFA solution attempted to extract a nine-factor matrix failed to find a local minimum in the iteration limit. A PCA extraction was attempted as an alternate which converged on nine components in 13 iterations, explaining 69.30% of the variance. The EFA process was re-run forcing a seven-factor extraction in line with the original NOSACQ-50 survey instrument. The ML extraction successfully converged on seven factors; however, it only explained 59.06% of the variance. While reliability analyses of the full NOSACQ-50 instrument was sound ($\alpha = 0.968$), the seven-factor model of the EFA was rejected at the goodness of fit test. The analysis could have been suspended at this point due to the rejection of the goodness of fit test, however, it is widely accepted that while a factor analysis may not yield statistical significance, there may still be underlying correlations between items that are statistically significant (Hair et al. 2006). As such, the statistically significant correlations between items were further explored and reported.

Analysis of Variance within the Pre-Intervention NOSACQ-50

An analysis of variance was conducted to compare the effect of respondent demographic profiles on the mean NOSACQ-50 score in the Pre-Intervention Data Collection, with a summary of results presented in Table 4.8.

Table 4.8 ANOVA of Demographics with Pre-Intervention NOSACQ-50

		Mean	Std. Deviation	N	F	Sig.
Gender	Male	3.2413	.45161	115	.666	.515
	Female	3.3180	.38384	36		
	Prefer not to answer	3.1180	.56314	5		
Role Type	Trades / Labour	3.0739	.46853	41	10.000	.002
	Salaried / Administration	3.3196	.41175	115		
Employment Type	Full Time	3.2529	.43524	147	.200	.819
	Part Time	3.1942	.59286	4		
	Casual / Contract	3.3669	.53470	5		
People Leader	Yes	3.3347	.38624	78	5.269	.023
	No	3.1754	.47613	78		
Leader Role	Executive Manager	3.5565	.20542	4	1.271	.290
	Contract / Regional Manager	3.4718	.22367	13		
	Operational / Functional Manager	3.3023	.41961	25		
	Coordinator / Supervisor	3.2831	.41305	36		

Table 4.8 (Continued)

		Mean	Std. Deviation	N	F	Sig.
Work Group	Alpha	3.0533	.11044	3	.965	.495
	Bravo	3.2233	.49833	25		
	Charlie	3.5761	.19381	2		
	Delta	3.2883	.44372	14		
	Echo	3.0047	.41302	15		
	Foxtrot	3.5344	.42068	4		
	Hotel	3.5356	.47346	3		
	India	2.9717	.	1		
	Juliet	3.2309	.31156	10		
	Lima	3.2908	.41469	37		
	Mike	3.5077	.36914	6		
	November	3.5170	.08618	2		
	Oscar	3.1828	.50621	25		
	Papa	3.2499	.23470	2		
	Quebec	3.3966	.49586	5		
	Romeo	3.4348	.48664	2		
Length of Service	Less than 1 year	3.3824	.45484	21	.675	.610
	1-2 years	3.1817	.44169	27		
	2-5 years	3.2502	.48280	48		
	5-10 years	3.2693	.33579	33		
	More than 10 years	3.2206	.46551	27		
Age	21 - 30	3.2237	.32938	24	1.878	.117
	31 - 40	3.1349	.52434	40		
	41 - 50	3.3857	.39916	47		
	51 - 60	3.2493	.43185	35		
	61 +	3.2170	.42520	10		

Discussion on the Pre-Intervention NOSACQ-50 ANOVA

The ANOVA of the Pre-Intervention NOSACQ-50 identified that two demographic characteristics had a statistically significant effect on the mean NOCACQ-50 score. The effect of *Role Type* on the mean NOSACQ-50 score was significant, [F (1,154) = 10.000, p=.002], indicating that the mean NOSACQ-50 score of those respondents in Salaried/Administrative roles (M=3.320; SD=0.412) is statistically higher than that of Trades/Labour roles (M=3.074; SD=0.469). The effect of *People Leader* on the mean NOSACQ-50 score was also statistically significant, [F (1,154) = 5.269, p=.023], indicating that the mean NOSACQ-50 score of those respondents identifying as People Leaders (M=3.335; SD=0.386) is statistically higher than those not identifying as People Leaders (M=3.175; SD=0.476). This suggests that Office Workers and People Leaders perceive the Company's safety climate as being more positive than Trades-Based Workers and non-people leaders, respectively.

No other demographic characteristics had a statistically significant effect on the mean NOSACQ-50 scores of Pre-Intervention respondents.

4.2.5 Safety Performance

As described in Section 3.5.2, the safety performance metrics were extracted from the Company's safety reporting system for the Pre- and Post-Intervention Data Collection points. These safety performance metrics were grouped into three categories: Safety Compliance, Safety Participation, and Occupational Injuries. This section reports the Pre-Intervention safety performance data analysis results, including the summary statistics and correlations between the safety performance metrics, NOSACQ-50 and ALI instruments.

Summary Statistics of Pre-Intervention Safety Performance

Descriptive statistics for the four Pre-Intervention safety compliance metrics are presented in Table 4.9. Workgroups with missing data were excluded from further analysis, and all datasets met the assumptions for normality.

Table 4.9 Pre-Intervention Safety Performance (Compliance) Descriptive Statistics.

	Survey Year		Statistic	Std. Error
Com_WSR	2017	Mean	20.4167	10.26428
		Median	6.0000	
		Variance	1264.265	
		Std. Deviation	35.55651	
		Skewness	2.548	.637
		Kurtosis	7.014	1.232
Com_Inc	2017	Mean	10.0833	3.57063
		Median	4.0000	
		Variance	152.992	
		Std. Deviation	12.36901	
		Skewness	1.452	.637
		Kurtosis	1.870	1.232
Com_NM	2017	Mean	2.6667	1.02494
		Median	1.5000	
		Variance	12.606	
		Std. Deviation	3.55050	
		Skewness	1.309	.637
		Kurtosis	.734	1.232
Com_Hazard	2017	Mean	45.2500	11.89227
		Median	35.0000	
		Variance	1697.114	
		Std. Deviation	41.19604	
		Skewness	.923	.637
		Kurtosis	-.758	1.232

Descriptive statistics for the four Pre-Intervention safety participation metrics are presented in Table 4.10. Workgroups with missing data were excluded from further analysis. All datasets met the assumptions for normality, except for the number of Safety Conversations recorded (Par_SC), which returned non-normal kurtosis levels of 11.715.

Table 4.10 Pre-Intervention Safety Performance (Participation) Descriptive Statistics

	Survey Year		Statistic	Std. Error
Par_WSRC	2017	Mean	3.0000	1.24316
		Median	2.0000	
		Variance	18.545	
		Std. Deviation	4.30644	
		Skewness	2.287	.637
		Kurtosis	5.742	1.232
Par_HAZC	2017	Mean	11.1667	3.06454
		Median	7.5000	
		Variance	112.697	
		Std. Deviation	10.61588	
		Skewness	2.026	.637
		Kurtosis	4.916	1.232
Par_SC	2017	Mean	363.0000	244.94393
		Median	117.5000	
		Variance	719970.364	
		Std. Deviation	848.51067	
		Skewness	3.407	.637
		Kurtosis	11.715	1.232
Par_SCC	2017	Mean	12.8333	3.35485
		Median	10.0000	
		Variance	135.061	
		Std. Deviation	11.62156	
		Skewness	2.409	.637
		Kurtosis	6.629	1.232

Descriptive statistics for the two Pre-Intervention occupational injuries metrics are presented in Table 4.11. Workgroups with missing data were excluded from further analysis, and all datasets met the assumptions for normality.

Table 4.11 Pre-Intervention Safety Performance (Occupational Injuries) Descriptive Statistics

	Survey Year		Statistic	Std. Error
Inj_TRI	2017	Mean	.2500	.13056
		Median	.0000	
		Variance	.205	
		Std. Deviation	.45227	
		Skewness	1.327	.637
		Kurtosis	-.326	1.232
Inj_All	2017	Mean	2.6667	1.20814
		Median	1.0000	
		Variance	17.515	
		Std. Deviation	4.18511	
		Skewness	2.166	.637
		Kurtosis	4.757	1.232

4.2.6 Relationships Between Variables

Correlations

Correlational analysis was undertaken on the various safety performance metrics for the Pre-Intervention Data Collection point by the workgroup. The ALI and NOSACQ-50 factors for each Workgroup were included to compare any observed relationship between these factors and the safety performance metrics. The results of the correlational analysis are presented below.

Pre-Intervention Respondent Demographics, NOSACQ-50 and ALI Correlations

Bivariate correlational analysis was undertaken on the respondent demographics, the seven dimensions of the NOSACQ-50 instrument, and the ALI instrument's four dimensions. These results are presented in Table 4.12 for the Pre-Intervention Data Collection. Correlations significant at the 0.05 and 0.01 levels (2-tailed) were highlighted for ease of comparison.

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Table 4.12 Pre-Intervention Survey Correlations (Demographics and NOSACQ-50 / ALI Variables)

	Gender	Role	Employment Status	People Leader	Manager Role	Work Group	Length of Service	Age	NOSACQ_Dim1	NOSACQ_Dim2	NOSACQ_Dim3	NOSACQ_Dim4	NOSACQ_Dim5	NOSACQ_Dim6	NOSACQ_Dim7	ALI_S	ALI_R	ALI_B	ALI_M
Gender	1	.198*	.286**	.172*	0.144	0.022	-0.052	-.218**	0.023	0.025	0.066	0.033	-0.042	0.059	-0.027	0.117	0.065	0.099	-0.007
Role		1	-0.050	-.335**	-.327**	0.049	-0.061	-0.098	.256**	.267**	.326**	.199*	.211**	0.040	0.152	.176*	0.114	.171*	.196*
Employment Status			1	.168*	0.056	-0.008	-0.101	0.088	0.099	0.035	0.040	-0.039	0.011	0.044	-0.005	0.078	0.123	0.096	0.007
People Leader				1	.c	0.114	-.172*	-0.140	-.195*	-.204*	-.225**	-0.099	-0.123	-0.072	-0.150	-0.093	-.168*	-0.090	-.179*
Manager Role					1	-0.079	0.151	.227*	-0.195	-0.163	-0.171	-0.161	-0.124	-0.202	-0.165	-0.157	-0.205	-0.190	-.281*
Work Group						1	-.197*	-.168*	-0.005	0.065	0.027	0.028	0.029	0.087	0.022	0.129	-0.007	0.066	0.100
Length of Service							1	.327**	-0.023	-0.038	-0.125	-0.064	-0.014	-0.062	0.010	-.189*	-0.157	-0.157	-0.130
Age								1	0.083	0.100	-0.010	0.007	0.087	0.084	0.065	-0.101	-0.088	-0.076	-0.148
NOSACQ_Dim1									1	.797**	.809**	.701**	.667**	.617**	.684**	.597**	.631**	.606**	.636**
NOSACQ_Dim2										1	.796**	.701**	.613**	.644**	.683**	.639**	.643**	.649**	.661**
NOSACQ_Dim3											1	.693**	.584**	.578**	.603**	.621**	.657**	.611**	.634**
NOSACQ_Dim4												1	.774**	.700**	.715**	.449**	.478**	.455**	.451**
NOSACQ_Dim5													1	.613**	.727**	.376**	.390**	.399**	.371**
NOSACQ_Dim6														1	.754**	.477**	.496**	.469**	.475**
NOSACQ_Dim7															1	.436**	.482**	.471**	.482**
ALI_S																1	.859**	.911**	.848**
ALI_R																	1	.862**	.846**
ALI_B																		1	.837**
ALI_M																			1

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).
c. Cannot be computed because at least one of the variables is constant.

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Gender and Age. Gender demonstrated statistically significant correlations with Role Type, Employment Status, Age and whether the respondent identified as a People Leader. The respondent demographics of Age did not yield any other correlations of statistical significance (apart from Gender).

Role Type and Employment Status. Role Type returned statistically significant correlations with those respondents identifying as a People Leader and the subsequent Leadership Position. Role Type was also statistically significantly correlated with five of the seven dimensions of the NOSACQ-50 instrument and three of the four ALI instrument dimensions. The respondent demographics of Employment Status did not yield any other correlations of statistical significance (apart from Role Type).

People Leader and Leadership Position. People Leader returned statistically significant correlations with Gender, Role Type, Employment Status, and Length of Service. People Leader was also significantly correlated with three of the seven dimensions of the NOSACQ-50 instrument and two of the four ALI instrument dimensions. The respondent demographics of Leadership Position yielded statistically significant correlations with Role Type, Age, and one dimension of the ALI instrument.

Workgroup. There were statistically significant correlations between the respondent's identified Workgroup, Length of Service and Age.

NOSACQ-50 and ALI. All seven dimensions of the NOSACQ-50 instrument yielded statistically significant correlations with each of the other NOSACQ-50 dimensions and all the ALI dimensions. Similarly, each of the four ALI dimensions significantly correlated with each of the other ALI dimensions. There were mixed yields of significant correlations between both instruments and Role Type, People Leader, Leadership Position, and Length of Service.

Pre-Intervention Safety Performance Metrics, NOSACQ-50 and ALI

As per the conceptual model, the study was interested in the relationship between the Authentic Leadership, Safety Climate and Safety Performance variables. Dummy variables were developed representing Authentic Leadership and Safety Climate. The indicators of Safety Performance were retained for analysis purposes.

Bivariate correlational analysis was undertaken on the safety performance metrics, the mean NOSACQ-50 score, and the mean ALI scores. These results are presented in Table 4.13 for the Pre-Intervention Data Collection. Correlations significant at the 0.05 and 0.01 levels (2-tailed) were highlighted for ease of comparison.

Table 4.13 Pre-Intervention Safety Performance Correlations (including NOSACQ-50 / ALI)

	Com WSR	Com Inc	Com NM	Com Hazard	Par WSRC	Par HAZC	Par_SC	Par_SCC	Inj_TRI	Inj_All	NOSACQ	ALI
Com WSR	1	.776**	.588*	.539	.939**	.918**	.924**	.875**	.547	.275	.105	.128
Com_Inc		1	.820**	.463	.821**	.784**	.766**	.797**	.825**	.745**	-.186	.085
Com NM			1	.497	.725**	.752**	.563	.593*	.453	.402	-.080	.135
Com Hazard				1	.711**	.708**	.503	.525	.421	.099	.441	.372
Par WSRC					1	.982**	.890**	.856**	.607*	.298	.082	.183
Par HAZC						1	.872**	.863**	.521	.212	.154	.210
Par_SC							1	.929**	.528	.320	-.049	.110
Par_SCC								1	.579*	.376	.041	.141
Inj_TRI									1	.865**	-.144	.223
Inj_All										1	-.376	-.017
NOSACQ											1	.627*
ALI												1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

There were considerable cross-correlations between Safety Compliance and Safety Participation, apart from Hazards Reported (Com_Hazard), which only yielded three instances of statistically significant correlations with other metrics. Occupational Injuries' two metrics returned statistically significant correlations internally and with Incidents Reports (Com_Inc), Worksite Review Contributors (Par_WSRC), and Safety Conversation Contributors (Par_SCC). The mean NOSACQ-50 and ALI were only statistically significantly correlated internally between themselves.

4.3 QUANTITATIVE RESULTS: POST-INTERVENTION

4.3.1 Data Preparation

The study's data required processing to convert the data collected into a format suitable for answering the study's research questions (Zikmund et al. 2013). The

primary data range was confirmed to be suitable for further analysis by following the data cleaning and screening recommendations of Creswell (2014) and Hair et al. (2006); firstly, checking for inconsistencies in the data and examining any missing data.

Response Rates

The survey was administered according to the methodology outlined in Chapter 3. The sampling strategy included purposive, convenience, and nonprobability techniques, with the invitation to participate in the survey extended to all employees of the Company. This sampling effort resulted in 175 responses commencing the Post-Intervention survey. After data preparation, 155 (88.57%) valid responses were retained for further analysis after invalid responses were removed for not meeting the predetermined criteria for missing data.

The Post-Intervention sample size of 155 equated to >50% of the total sample population of the Company. The sample size was deemed sufficient for the explanatory nature of the study.

Missing data

Following the four-step process outlined by Hair et al. (2006) the survey set included missing data that was not ignorable. These missing data were not random, were easily identifiable by the researcher, and were associated with the respondents failing to complete the survey. The missing data within cases was extensive and considered high enough to affect the analysis without action. The most efficient remedy method was to delete these incomplete responses with missing data (Hair et al. 2006). Failure to complete the entire instrument embedded in the survey meant failure to assess safety climate or authentic leadership concepts for these cases. Therefore, it was unnecessary to continue with steps three and four of Hair et al. (2006) – assessing the randomness of missing data and choosing the method of imputing the missing data.

Following this process, 20 individual invalid responses were eliminated from the Post-Intervention survey dataset. No replacement of missing values was conducted. The remaining Post-Intervention responses with no missing data and suitable for analysis was 155.

Outliers

Univariate analysis was undertaken to assess for potential outliers. The univariate analysis is used to identify any unique or extreme observations. Responses falling outside the range of 2.5 to 4 standard deviations from the mean indicate the detection of an outlier (Hair et al. 2006). No univariate outliers were detected following a review of the standard deviations.

Normality

Normality was assessed using both graphical (boxplots, histograms, P-P Plots) and statistical assessment (Kolmogorov-Smirnov, Shapiro-Wilks tests). Measures of skewness and kurtosis were also assessed to determine any possible impacts due to the distribution shape.

As a reference for substantial departure from normality, this study used the criteria for univariate non-normality of >|3.0| Skewness and >|8.0| Kurtosis (Kline 2016) as a guide. Based on these criteria, all items were regarded as not representing a substantial departure from normality and not requiring further remedy for non-normality.

4.3.2 Respondent Profiles

Demographic characteristics of the survey respondents were collected and extracted from the questionnaire. Descriptive statistics of the respondent profiles assist the researcher with identifying suitability or further multivariate analysis (Hair et al. 2006) and provide the researcher with a richer and deeper understanding of the sample.

In total, 155 Post-Intervention responses were included in the analysis. The demographic information in the online survey covered: gender, age, role type, employment status, tenure, whether they identified as a people leader (and subsequently their leadership position), and their workgroup. Table 4.14 provides an overview of the Post-Intervention sample respondent profiles.

Table 4.14 Frequency of Post-Intervention Respondent Profiles

		Frequency	Valid Percent	Cumulative Percent
Gender	Male	109	70.3	70.3
	Female	43	27.7	98.1
	Prefer not to answer	3	1.9	100.0
	Total	155	100.0	
Age	18 - 21	1	.6	.6
	21 - 30	21	13.5	14.2
	31 - 40	50	32.3	46.5
	41 - 50	48	31.0	77.4
	51 - 60	29	18.7	96.1
	61 +	6	3.9	100.0
	Total	155	100.0	
Role Type	Trades / Labour	50	32.3	32.3
	Salaried / Administration	105	67.7	100.0
	Total	155	100.0	
Employment Status	Full Time	145	93.5	93.5
	Part Time	4	2.6	96.1
	Casual / Contract	6	3.9	100.0
	Total	155	100.0	
Tenure	Less than 1 year	41	26.5	26.5
	1-2 years	33	21.3	47.7
	2-5 years	39	25.2	72.9
	5-10 years	21	13.5	86.5
	More than 10 years	21	13.5	100.0
	Total	155	100.0	
People Leader	Yes	68	43.9	43.9
	No	87	56.1	100.0
	Total	155	100.0	
Leadership Position	Executive Manager	3	4.4	5.1
	Contract / Regional Manager	16	23.5	21.8
	Operational / Functional Manager	25	36.8	53.8
	Coordinator / Supervisor	24	35.3	100.0
	Sub-Total	68	100.0	
	Non-People Leader	87		
	Total	155		
Work Group	Alpha	3	1.9	1.9
	Bravo	20	12.9	14.8
	Charlie	3	1.9	16.8
	Delta	11	7.1	23.9
	Echo	14	9.0	32.9
	Foxtrot	2	1.3	34.2
	Golf	25	16.1	50.3
	Hotel	3	1.9	52.2
	India	2	1.3	53.5
	Juliet	19	12.3	65.8
	Kilo	7	4.5	70.3
	Lima	32	20.6	90.9
	Mike	12	7.7	98.6
	November	2	1.3	100
	Total	155	100.0	

Gender and Age. The Post-Intervention sample consisted of 70.3% males and 27.7% females. 1.9% of respondents preferred to identify or disclose a gender. This is consistent with the gender breakdown of the Pre-Intervention sample. The respondents' age was nearly normally distributed, with the average respondents (32.3%) between 31-40 years old. Those aged between 41-50 years old accounted for

a further 31.0%. Most participants (63.3%) were between 31-50 years of age, showing a shift in the age profile compared to the Pre-Intervention sample.

Role Type and Employment Status. The Post-Intervention sample consisted of 67.7% salaried/administration-based respondents and 32.3% trades/labour respondents. Again, the split of role type was not unexpected and comes closer to the 65/35 split between salaried/administration and trades/labour employees for the Company. Consistent with the Pre-Intervention sample, most respondents (93.5%) reported being full-time, permanent employees of the Company, with part-time (2.6%) and casual/contract employees (3.9%) making up the balance of respondents.

Tenure. The respondents' length of service with the Company shifted since the Pre-Intervention data collection, with the average respondents (26.5%) employed for less than one year. 73.0% of respondents had been employed with the Company for five years or less, compared to 61.6% in the Pre-Intervention sample.

People Leader and Leadership Position. 43.9% of the Post-Intervention sample reported being in a people leadership role. Of these respondents, 15.5% identified as Coordinator/Supervisor, and 16.1% as Operational/Functional Managers. 10.3% of respondents identified as Contract/Regional Managers, and 1.9% were Executive Managers.

Workgroup. The 155 respondents from the Post-Intervention sample came from 14 workgroups across the Victoria/Tasmania regions of the Company. Most respondents (58.6.7%) came from four of the workgroups, being Lima (20.6%), Golf (16.1%), Bravo (12.9%), and Echo (9.0%).

4.3.3 Authentic Leadership Inventory

The ALI survey instrument was utilised to gain insights from the respondents on their perceptions of authentic leadership being demonstrated within the Company. The analysis of the ALI survey instrument is presented in this section, presenting the summary statistics, exploratory factor analysis and analysis of variation.

Summary Statistics of the Post-Intervention ALI

Descriptive statistics are presented for the four dimensions of the ALI survey instrument in Table 4.15. The mean scores for the four dimensions ranged from 3.85 to 4.07, and the standard deviations reported show no unexpected results.

Table 4.15 Post-Intervention ALI Descriptive Statistics

		Statistic	Std. Error
ALI_S	Mean	3.8463	.07339
	Median	4.0000	
	Variance	.830	
	Std. Deviation	.91079	
	Skewness	-.921	.195
	Kurtosis	.834	.389
ALI_R	Mean	4.0671	.08151
	Median	4.3333	
	Variance	1.023	
	Std. Deviation	1.01147	
	Skewness	-1.248	.195
	Kurtosis	1.089	.389
ALI_B	Mean	3.8864	.07691
	Median	4.0000	
	Variance	.911	
	Std. Deviation	.95447	
	Skewness	-1.055	.195
	Kurtosis	1.092	.389
ALI_M	Mean	3.9156	.06841
	Median	4.0000	
	Variance	.721	
	Std. Deviation	.84898	
	Skewness	-1.111	.195
	Kurtosis	1.584	.389

Exploratory Factor Analysis: Validity and Reliability of the ALI Instrument

Bartlett's test of sphericity was significant for the ALI instrument at 0.955 sampling adequacy. The KMO measure of sampling adequacy for the NOSACQ-50 instrument is 0.955. The ML extraction converged for a four-factor model, explaining a total of 73.38% of variance.

The Goodness of Fit Test of the four-factor model is presented in Table 4.16. Non-significant values suggest a good fitting model. With a *p*-value >0.05, the four-factor model is accepted.

Table 4.16 Post-Intervention ALI Factor Analysis (ML) – 4 Factors Goodness of Fit Test

Chi-Square	df	Sig.
40.231	32	.151

Reliability analysis on the Post-Intervention ALI instrument and its four dimensions were completed. Using Cronbach's alpha, the ALI instrument was determined to be internally consistent and reliable (α = 0.962).

Discussion on the Post-Intervention ALI EFA

Fourteen items from the ALI instrument were subjected to the ML extraction method with Orthogonal (Varimax) rotation. The initial EFA solution attempted to extract a one-factor matrix using ML, explaining 65.60% of the variance. The EFA process was re-run forcing a four-factor extraction in line with the original ALI survey instrument. The ML extraction successfully converged on four factors and satisfactorily explained 73.37% of the variance. Reliability analysis of the full ALI instrument was sound (α = 0.962), and the four-factor model of the EFA was accepted at the goodness of fit test.

Analysis of Variation within the Post-Intervention ALI

An analysis of variance was conducted to compare the effect of respondent demographic profiles on the mean ALI score in the Post-Intervention Data Collection, with a summary of results presented in Table 4.17.

Table 4.17 ANOVA of Demographics with Post-Intervention ALI

		Mean	Std. Deviation	N	F	Sig.
Gender	Male	3.8362	.91720	109	2.113	.124
	Female	4.1453	.76310	42		
	Prefer not to answer	4.2639	.73637	3		
Role Type	Trades / Labour	3.6608	1.01147	50	7.107	.009
	Salaried / Administration	4.0577	.78585	104		
Employment Type	Full Time	3.9368	.89657	144	.128	.880
	Part Time	3.7188	.93255	4		
	Casual / Contract	3.8785	.50953	6		
People Leader	Yes	4.0870	.73236	68	3.991	.048
	No	3.8038	.97060	86		
Leader Role	Executive Manager	4.0278	1.25716	3	.862	.466
	Contract / Regional Manager	4.3451	.50104	16		
	Operational / Functional Manager	4.0108	.88642	25		
	Coordinator / Supervisor	4.0017	.61701	24		

Table 4.17 (Continued)

		Mean	Std. Deviation	N	F	Sig.
Work Group	Alpha	2.7014	1.16188	3	1.519	.117
	Bravo	3.7677	1.07468	20		
	Charlie	4.1181	.32364	3		
	Delta	3.8636	.56338	11		
	Echo	3.5223	1.15025	14		
	Foxtrot	3.3333	.70711	2		
	Golf	4.2367	.70071	25		
	Hotel	4.6458	.11600	3		
	India	3.6979	.98700	2		
	Juliet	4.0439	.88273	19		
	Kilo	4.2292	.55785	7		
	Lima	3.9254	.73548	31		
	Mike	3.8177	1.11549	12		
	November	4.7813	.13258	2		
Length of Service	Less than 1 year	4.0218	.67240	41	.594	.668
	1-2 years	4.0473	.96143	33		
	2-5 years	3.8114	1.08132	39		
	5-10 years	3.9354	.82238	20		
	More than 10 years	3.7728	.78243	21		
Age	18 - 20	4.6667	.	1	.647	.664
	21 - 30	4.1468	.55744	21		
	31 - 40	3.8771	1.00831	50		
	41 - 50	3.9796	.83739	47		
	51 - 60	3.7795	.85508	29		
	61 +	3.7986	1.24490	6		

Discussion on the Post-Intervention ALI ANOVA

The ANOVA of the Post-Intervention ALI identified that two demographic characteristics had a statistically significant effect on the mean ALI score. The effect of *Role Type* on the mean ALI score was statistically significant, [F (1,155) = 7.107, p=.009], indicating that the mean ALI score of those respondents in Salaried/Administrative roles (M=4.058; SD=0.786) is statistically higher than that of Trades/Labour roles (M=3.661; SD=1.011). The effect of *People Leader* on the mean ALI score was also statistically significant, [F (1,155) = 3.991, p=.048], indicating that the mean ALI score of those respondents identifying as People Leaders (M=4.087; SD=0.732) is statistically higher than those not identifying as People Leaders (M=3.804; SD=0.971). This suggests that Office Workers and People Leaders perceive their leaders as more authentic than Trades-Based Workers and non-people leaders, respectively.

No other demographic characteristics had a statistically significant effect on the mean ALI scores of Post-Intervention respondents.

4.3.4 NOSACQ-50 Safety Climate Questionnaire

The NOSACQ-50 survey instrument was utilised to gain insights from the respondents on their perceptions of the Company's safety climate. The analysis of the NOSACQ-50 survey instrument is presented in this section, presenting the summary statistics, exploratory factor analysis and analysis of variation.

Summary Statistics of the Post-Intervention NOSACQ-50

Descriptive statistics for the seven dimensions of the NOSACQ-50 survey instrument are presented in Table 4.18. Mean scores for the seven dimensions ranged from 3.17 to 3.37. The means and standard deviations reported show no unexpected results.

Table 4.18 Post-Intervention NOSACQ-50 Descriptive Statistics

		Statistic	Std. Error
NOSACQ Dim1	Mean	3.2642	.04491
	Median	3.3333	
	Variance	.315	
	Std. Deviation	.56095	
	Skewness	-1.039	.194
	Kurtosis	1.531	.386
NOSACQ Dim2	Mean	3.2280	.04228
	Median	3.1429	
	Variance	.279	
	Std. Deviation	.52802	
	Skewness	-.451	.194
	Kurtosis	.593	.386
NOSACQ Dim3	Mean	3.1870	.04606
	Median	3.1667	
	Variance	.331	
	Std. Deviation	.57528	
	Skewness	-.715	.194
	Kurtosis	1.318	.386
NOSACQ Dim4	Mean	3.2468	.03890
	Median	3.1667	
	Variance	.236	
	Std. Deviation	.48581	
	Skewness	-.157	.194
	Kurtosis	-.443	.386
NOSACQ Dim5	Mean	3.1932	.03761
	Median	3.1429	
	Variance	.221	
	Std. Deviation	.46970	
	Skewness	-.324	.194
	Kurtosis	.395	.386
NOSACQ Dim6	Mean	3.2989	.04004
	Median	3.2500	
	Variance	.250	
	Std. Deviation	.50012	
	Skewness	-.396	.194
	Kurtosis	.238	.386

Table 4.18 (Continued)

		Statistic	Std. Error
NOSACQ Dim7	Mean	3.3672	.03770
	Median	3.2857	
	Variance	.222	
	Std. Deviation	.47091	
	Skewness	-.066	.194
	Kurtosis	-1.221	.386

Exploratory Factor Analysis: Validity and Reliability of the NOSACQ-50 Instrument

Bartlett's test of sphericity was significant for the NOSACQ-50 instrument at 0.921 sampling adequacy. The KMO measure of sampling adequacy for the NOSACQ-50 instrument is 0.921. The ML extraction converged for a seven-factor model, explaining a total of 58.25% of variance.

The Goodness of Fit Test of the seven-factor model is presented in

Table 4.19. Non-significant values suggest a good fitting model. With a p-value <0.05, the seven-factor model is rejected.

Table 4.19 Post-Intervention NOSACQ-50 Factor Analysis – 7 Factors (ML) Goodness of Fit Test

Chi-Square	df	Sig.
1275.860	896	.000

Reliability analysis on the Post-Intervention NOSACQ-50 instrument and its seven dimensions were completed. Using Cronbach's alpha, the NOSACQ-50 instrument was determined to be internally consistent and reliable (α = 0.969).

Discussion on the Post-Intervention NOSACQ-50 EFA

Fifty items from the NOSACQ-50 instrument were subjected to the ML extraction method with Orthogonal (Varimax) rotation. The initial EFA solution attempted to extract a nine-factor matrix using ML, converging in 16 iterations and explaining 61.02% of the variance. The EFA process was re-run forcing a seven-factor extraction in line with the original NOSACQ-50 survey instrument. The ML extraction successfully converged on seven factors; however, it only explained 58.25% of the variance. While reliability analyses of the full NOSACQ-50 instrument was sound (α = 0.969), the seven-factor model of the EFA was rejected at the goodness of fit test.

Again, the analysis could have been suspended at this point due to the rejection of the goodness of fit test, however, the underlying correlations between items may still provide statistical significance. As such, the statistically significant correlations between items were further explored and reported.

Analysis of Variance within the Post-Intervention NOSACQ-50

An analysis of variance was conducted to compare the effect of respondent demographic profiles on the mean NOSACQ-50 score in the Post-Intervention Data Collection, with a summary of results presented in Table 4.20.

Table 4.20 ANOVA of Demographics with Post-Intervention NOSACQ-50

		Mean	Std. Deviation	N	F	Sig.
Gender	Male	3.2700	.44920	109	1.243	.291
	Female	3.3779	.37048	43		
	Prefer not to answer	3.4850	.51571	3		
Role Type	Trades / Labour	3.1504	.46874	50	9.944	.002
	Salaried / Administration	3.3773	.39272	105		
Employment Type	Full Time	3.3050	.43657	145	.204	.816
	Part Time	3.3963	.34270	4		
	Casual / Contract	3.2202	.36718	6		
People Leader	Yes	3.3916	.38780	68	5.134	.025
	No	3.2357	.45168	87		
Leader Role	Executive Manager	3.4351	.37082	3	1.112	.351
	Contract / Regional Manager	3.5380	.31330	16		
	Operational / Functional Manager	3.3635	.40531	25		
	Coordinator / Supervisor	3.3177	.41109	24		
Work Group	Alpha	3.0983	.35686	3	1.344	.195
	Bravo	3.2178	.38357	20		
	Charlie	3.5306	.30635	3		
	Delta	3.2954	.42333	11		
	Echo	3.0949	.61886	14		
	Foxtrot	3.1151	.93439	2		
	Golf	3.4035	.37656	25		
	Hotel	3.7289	.34161	3		
	India	3.1944	.25441	2		
	Juliet	3.2558	.42680	19		
	Kilo	3.5490	.36550	7		
	Lima	3.3402	.37518	32		
	Mike	3.1822	.46224	12		
	November	3.8221	.15059	2		
Length of Service	Less than 1 year	3.4187	.37780	41	1.674	.159
	1-2 years	3.3036	.45597	33		
	2-5 years	3.1741	.44505	39		
	5-10 years	3.2918	.46613	21		
	More than 10 years	3.3347	.39329	21		
Age	18 - 20	2.9315	.	1	.213	.956
	21 - 30	3.3324	.40339	21		
	31 - 40	3.2877	.46056	50		
	41 - 50	3.2962	.40989	48		
	51 - 60	3.3367	.43869	29		
	61 +	3.3095	.53140	6		

Discussion on the Post-Intervention NOSACQ-50 ANOVA

The ANOVA of the Post-Intervention NOSACQ-50 identified that two demographic characteristics had a statistically significant effect on the mean NOCACQ-50 score. The effect of *Role Type* on the mean NOSACQ-50 score was significant, [F (1,155) = 9.944, p=.002], indicating that the mean NOSACQ-50 score of those respondents in Salaried/Administrative roles (M=3.377; SD=0.393) is statistically higher than that of Trades/Labour roles (M=3.150; SD=0.469). The effect of *People Leader* on the mean NOSACQ-50 score was also statistically significant, [F (1,155) = 5.134, p=.025], indicating that the mean NOSACQ-50 score of those respondents identifying as People Leaders (M=3.392; SD=0.388) is statistically higher than those not identifying as People Leaders (M=3.236; SD=0.452). This suggests that Office Workers and People Leaders perceive the Company's safety climate as being more positive than Trades-Based Workers and non-people leaders, respectively.

No other demographic characteristics had a statistically significant effect on the mean NOSACQ-50 scores of Post-Intervention respondents.

4.3.5 Safety Performance

This section reports the Post-Intervention safety performance data analysis results, including the summary statistics and correlations between the safety performance metrics, NOSACQ-50 and ALI instruments.

Summary Statistics of Post-Intervention Safety Performance

Descriptive statistics for the four Post-Intervention safety compliance metrics are presented in Table 4.21. Workgroups with missing data were excluded from further analysis, and all datasets met the assumptions for normality.

Table 4.21 Post-Intervention Safety Performance (Compliance) Descriptive Statistics

	Survey Year		Statistic	Std. Error
Com_WSR	2018	Mean	26.3333	12.90955
		Median	14.0000	
		Variance	1999.879	
		Std. Deviation	44.72000	
		Skewness	3.026	.637
		Kurtosis	9.780	1.232
Com_Inc	2018	Mean	10.5833	3.51503
		Median	5.5000	
		Variance	148.265	
		Std. Deviation	12.17642	
		Skewness	1.658	.637
		Kurtosis	2.679	1.232

Table 4.21 (Continued)

	Survey Year		Statistic	Std. Error
Com_NM	2018	Mean	3.7500	1.85507
		Median	1.0000	
		Variance	41.295	
		Std. Deviation	6.42615	
		Skewness	2.406	.637
		Kurtosis	6.359	1.232
Com_Hazard	2018	Mean	56.3333	32.38180
		Median	9.0000	
		Variance	12582.970	
		Std. Deviation	112.17384	
		Skewness	2.959	.637
		Kurtosis	9.269	1.232

Descriptive statistics for the four Pre-Intervention safety participation metrics are presented in Table 4.22. Workgroups with missing data were excluded from further analysis. All datasets met the assumptions for normality except for the number of WSR Contributors (Par_WSRC), and the number of Safety Conversations recorded (Par_SC), which returned non-normal kurtosis levels of 8.71 and 9.19, respectively.

Table 4.22 Post-Intervention Safety Performance (Participation) Descriptive Statistics

	Survey Year		Statistic	Std. Error
Par_WSRC	2018	Mean	3.2500	1.03810
		Median	2.5000	
		Variance	12.932	
		Std. Deviation	3.59608	
		Skewness	2.768	.637
		Kurtosis	8.711	1.232
Par_HAZC	2018	Mean	10.1667	3.20235
		Median	6.5000	
		Variance	123.061	
		Std. Deviation	11.09327	
		Skewness	1.712	.637
		Kurtosis	1.831	1.232
Par_SC	2018	Mean	393.8333	164.17673
		Median	245.0000	
		Variance	323447.970	
		Std. Deviation	568.72486	
		Skewness	2.898	.637
		Kurtosis	9.192	1.232
Par_SCC	2018	Mean	14.8333	3.28641
		Median	10.0000	
		Variance	129.606	
		Std. Deviation	11.38447	
		Skewness	.766	.637
		Kurtosis	-.312	1.232

Descriptive statistics for the two Post-Intervention occupational injuries metrics are presented in Table 4.23. Workgroups with missing data were excluded from further analysis, and all datasets met the assumptions for normality.

Table 4.23 Post-Intervention Safety Performance (Occupational Injuries) Descriptive Statistics

	Survey Year		Statistic	Std. Error
Inj_TRI	2018	Mean	.1667	.11237
		Median	.0000	
		Variance	.152	
		Std. Deviation	.38925	
		Skewness	2.055	.637
		Kurtosis	2.640	1.232
Inj_All	2018	Mean	3.5833	1.06215
		Median	3.0000	
		Variance	13.538	
		Std. Deviation	3.67939	
		Skewness	1.345	.637
		Kurtosis	1.424	1.232

4.3.6 Relationships Between Variables

Correlations

Correlational analysis was undertaken on the various safety performance metrics for the Post-Intervention Data Collection point by the workgroup. The ALI and NOSACQ-50 factors for each workgroup were analysed to compare any observed relationship between these factors and the safety performance metrics. The results of the correlational analysis are presented below.

Post-Intervention Respondent Demographics, NOSACQ-50 and ALI Correlations

Bivariate correlational analysis was undertaken on the respondent demographics, the seven dimensions of the NOSACQ-50 instrument, and the ALI instrument's four dimensions. These results are presented in Table 4.24 for the Post-Intervention Data Collection. Correlations significant at the 0.05 and 0.01 levels (2-tailed) were highlighted for ease of comparison.

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Table 4.24 Post-Intervention Survey Correlations (Demographics and NOSACQ-50 / ALI Variables)

	Gender	Role	Employment Status	People Leader	Manager Role	Work Group	Length of Service	Age	NOSACQ_Dim1	NOSACQ_Dim2	NOSACQ_Dim3	NOSACQ_Dim4	NOSACQ_Dim5	NOSACQ_Dim6	NOSACQ_Dim7	ALI_S	ALI_R	ALI_B	ALI_M
Gender	1	.405**	.215**	.193*	0.176	0.003	-0.052	-0.071	0.146	0.097	0.114	0.140	.159*	0.081	0.026	.185*	.168*	0.152	0.107
Role		1	0.106	-0.109	-.514**	0.146	-0.069	-0.147	.280**	.317**	.255**	.183*	.186*	.226**	0.057	.178*	.197*	.223**	.201*
Employment Status			1	.190*	0.136	0.037	-0.157	0.082	0.008	0.039	0.015	-0.043	0.002	-0.052	-0.086	-0.021	0.020	-0.040	-0.063
People Leader				1	.c	-0.036	-.209**	-0.130	-.170*	-.222**	-.214**	-0.117	-.189*	-.171*	-0.044	-0.127	-0.088	-.230**	-.166*
Manager Role					1	-0.145	0.064	-0.212	-0.088	-.290*	-0.046	-0.032	-0.185	-0.191	-0.168	-0.074	-0.082	-0.150	-0.216
Work Group						1	-.233**	0.004	0.111	.166*	.271**	0.082	0.142	.195*	0.145	0.114	.202*	.161*	0.133
Length of Service							1	.307**	-0.055	-0.109	-0.100	-0.086	-0.077	-0.085	-0.067	-0.059	-0.140	-0.096	-0.069
Age								1	0.026	0.043	-0.089	-0.009	0.093	-0.018	-0.014	-0.122	-0.112	-0.049	-0.101
NOSACQ_Dim1									1	.833**	.757**	.710**	.667**	.729**	.532**	.579**	.640**	.613**	.554**
NOSACQ_Dim2										1	.762**	.682**	.646**	.736**	.566**	.541**	.579**	.579**	.551**
NOSACQ_Dim3											1	.651**	.653**	.767**	.574**	.515**	.580**	.551**	.514**
NOSACQ_Dim4												1	.717**	.757**	.640**	.441**	.500**	.452**	.410**
NOSACQ_Dim5													1	.686**	.598**	.449**	.498**	.468**	.427**
NOSACQ_Dim6														1	.749**	.500**	.556**	.549**	.473**
NOSACQ_Dim7															1	.284**	.327**	.306**	.291**
ALI_S																1	.850**	.884**	.854**
ALI_R																	1	.895**	.842**
ALI_B																		1	.844**
ALI_M																			1

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).
c. Cannot be computed because at least one of the variables is constant.

c. Cannot be computed because at least one of the variables is constant.

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Gender and Age. Gender demonstrated statistically significant correlations with Role Type, Employment Status, and whether the respondent identified as a People Leader. The respondent demographics of Age did not yield any correlations of significance.

Role Type and Employment Status. Role Type returned statistically significant correlations with Leadership Position. Role Type was also statistically significantly correlated with six of the seven dimensions of the NOSACQ-50 instrument and all four ALI instrument dimensions. The respondent demographics of Employment Status yielded a statistically significant correlation with People Leader.

People Leader and Leadership Position. People Leader returned statistically significant correlations with Gender, Employment Status, and Length of Service. People Leader was also statistically significantly correlated with five of the seven dimensions of the NOSACQ-50 instrument and two of the four ALI instrument dimensions. The respondent demographics of Leadership Position yielded statistically significant correlations with Role Type and one dimension of the NOSACQ-50 instrument.

Workgroup. There were statistically significant correlations between the respondent's identified Workgroup and Length of Service, three of the seven dimensions of the NOSACQ-50 instrument and two of the four ALI instrument dimensions.

NOSACQ-50 and ALI. All seven dimensions of the NOSACQ-50 instrument yielded statistically significant correlations with each of the other NOSACQ-50 dimensions and all the ALI dimensions. Similarly, each of the four ALI dimensions statistically significantly correlated with each of the other ALI dimensions. There were mixed yields of statistically significant correlations between both instruments and Gender, Role Type, People Leader, Leadership Position, and Workgroup.

Post-Intervention Safety Performance Metrics, NOSACQ-50 and ALI

As per the conceptual model, the study was interested in the relationship between the Authentic Leadership, Safety Climate and Safety Performance variables.

Dummy variables were developed representing Authentic Leadership and Safety Climate. The indicators of Safety Performance were retained for analysis purposes.

Bivariate correlational analysis was undertaken on the safety performance metrics, the mean NOSACQ-50 score, and the mean ALI scores. These results are presented in Table 4.25 for the Post-Intervention Data Collection. Correlations significant at the 0.05 and 0.01 levels (2-tailed) were highlighted for ease of comparison.

Table 4.25 Post-Intervention Safety Performance Correlations (including NOSACQ-50 / ALI)

	Com WSR	Com Inc	Com NM	Com Hazard	Par WSRC	Par HAZC	Par SC	Par SCC	Inj TRI	Inj All	NOSACQ	ALI
Com WSR	1	.860**	.948**	.933**	.959**	.749**	.070	.436	-.129	.530	-.075	.141
Com_Inc		1	.965**	.762**	.800**	.666*	.247	.606*	-.118	.830**	-.278	-.002
Com NM			1	.867**	.880**	.708**	.099	.489	-.200	.687*	-.180	.050
Com Hazard				1	.939**	.805**	.034	.385	-.193	.388	-.102	.095
Par WSRC					1	.778**	.236	.501	.032	.476	-.078	.197
Par HAZC						1	.129	.730**	-.133	.311	.007	.295
Par_SC							1	.586*	.661*	.375	-.192	.025
Par_SCC								1	.376	.565	-.191	.182
Inj_TRI									1	.116	-.166	-.016
Inj_All										1	-.498	-.222
NOSACQ											1	.874**
ALI												1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

There were considerable cross-correlations between Safety Compliance and Safety Participation, apart from Safety Conversations Completed (Par_SC) and Safety Conversation Contributors (Par_SCC), which only yielded three instances of statistically significant correlations with other metrics. Occupational Injuries two metrics returned significant correlations with Incidents Reports (Com_Inc), Near Misses Reported (Com_NM) and Safety Conversation Completed (Par_SC). The mean NOSACQ-50 and ALI were only statistically significantly correlated internally between themselves.

4.4 PRE- AND POST-INTERVENTION CHANGES

4.4.1 Authentic Leadership Inventory

In order to test for any change between the data collection points, a multivariate analysis of variation (MANOVA) was performed. The descriptive statistics associated with the ALI instrument across the Pre-Intervention and Post-Intervention Data Collection points are reported in Table 4.26. The mean scores for the four dimensions ranged from 3.90 to 4.03 in 2017, and from 3.85 to 4.07 in 2018. The standard deviations reported show no unexpected results.

Table 4.26 Descriptive Statistics of ALI Dimensions Between Survey Years

	Survey Year	Mean	Std. Deviation	N
ALI S	2017	3.9199	.89949	154
	2018	3.8463	.91079	154
	Total	3.8831	.90443	308
ALI R	2017	4.0260	.96001	154
	2018	4.0671	1.01147	154
	Total	4.0465	.98468	308
ALI B	2017	3.8977	.91135	154
	2018	3.8864	.95447	154
	Total	3.8920	.93166	308
ALI M	2017	3.9416	.81489	154
	2018	3.9156	.84898	154
	Total	3.9286	.83086	308

Multivariate analysis of variance of the ALI

Levene's test was undertaken to test for equality between the groups' variances and tests the null hypothesis that the error variance of the dependent variable is equal across groups. Non-significant values suggest equal variances can be assumed. Examination of Levene's test confirmed *p*-values >0.05 for the equality of variance for the ALI means. Box's test of equality of covariance to test the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups. Non-significant values suggest equal variances can be assumed. Examination of Box's test identified *p*-values >0.05 for the equality of covariance, suggesting the assumptions are met for the ALI means, Box's M=8.405; p=0.601.

A multivariate analysis of variance was conducted to compare the mean scores for each of the four dimensions of the ALI survey instrument between the Pre- and Post-Intervention Data Collection points. A summary of the results is presented in Table 4.27, indicating no statistically significant difference between the means across the two data collection points.

Table 4.27 ALI ANOVA Between Survey Years

Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[i]
ALI S	.417	1	.417	.509	.476	.002	.509	.110
ALI R	.130	1	.130	.134	.715	.000	.134	.065
ALI B	.010	1	.010	.011	.915	.000	.011	.051
ALI M	.052	1	.052	.075	.784	.000	.075	.059

A multivariate analysis of variance was conducted to test the effect of respondent demographic profiles on the mean scores for each of the four dimensions of the ALI survey instrument between the Pre- and Post-Intervention Data Collection points. A summary of the results is presented in Table 4.28, indicating no statistically significant difference between the means across the two data collection points.

Table 4.28 ALI ANOVA Between Survey Years with Selection of Independent Variables

	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[i]
Survey Year AND Gender	ALI S	.500	1	.500	.623	.431	.002	.623	.123
	ALI R	.095	1	.095	.099	.753	.000	.099	.061
	ALI B	.023	1	.023	.027	.869	.000	.027	.053
	ALI M	.061	1	.061	.088	.767	.000	.088	.060
Survey Year AND Role Type	ALI S	.500	1	.500	.623	.431	.002	.623	.123
	ALI R	.095	1	.095	.099	.753	.000	.099	.061
	ALI B	.023	1	.023	.027	.869	.000	.027	.053
	ALI M	.061	1	.061	.088	.767	.000	.088	.060
Survey Year AND Employment Status	ALI S	.426	1	.426	.518	.472	.002	.518	.111
	ALI R	.117	1	.117	.120	.729	.000	.120	.064
	ALI B	.011	1	.011	.013	.910	.000	.013	.051
	ALI M	.049	1	.049	.070	.791	.000	.070	.058
Survey Year AND People Leader	ALI S	.307	1	.307	.378	.539	.001	.378	.094
	ALI R	.225	1	.225	.234	.629	.001	.234	.077
	ALI B	.001	1	.001	.002	.968	.000	.002	.050
	ALI M	.009	1	.009	.014	.906	.000	.014	.052
Survey Year AND Leader Role	ALI S	.065	1	.065	.120	.729	.001	.120	.064
	ALI R	.060	1	.060	.087	.769	.001	.087	.060
	ALI B	.615	1	.615	1.096	.297	.008	1.096	.180
	ALI M	.065	1	.065	.143	.705	.001	.143	.066
Survey Year AND Work Group	ALI S	.625	1	.625	.771	.380	.003	.771	.141
	ALI R	.044	1	.044	.046	.831	.000	.046	.055
	ALI B	.063	1	.063	.073	.787	.000	.073	.058
	ALI M	.130	1	.130	.190	.663	.001	.190	.072
Survey Year AND Length of Service	ALI S	.937	1	.937	1.157	.283	.004	1.157	.189
	ALI R	.007	1	.007	.008	.930	.000	.008	.051
	ALI B	.202	1	.202	.235	.628	.001	.235	.077
	ALI M	.222	1	.222	.322	.571	.001	.322	.087
Survey Year AND Age	ALI S	.566	1	.566	.698	.404	.002	.698	.132
	ALI R	.065	1	.065	.067	.796	.000	.067	.058
	ALI B	.026	1	.026	.030	.862	.000	.030	.053
	ALI M	.115	1	.115	.168	.683	.001	.168	.069
Survey Year AND Mean NOSACQ-50	ALI S	1.026	1	1.026	1.888	.170	.006	1.888	.278
	ALI R	.005	1	.005	.009	.926	.000	.009	.051
	ALI B	.243	1	.243	.439	.508	.001	.439	.101
	ALI M	.321	1	.321	.702	.403	.002	.702	.133

4.4.2 NOSACQ-50 Safety Climate Questionnaire

In order to test for any change between the data collection points, a MANOVA was performed. The descriptive statistics associated with the NOSACQ-50 safety climate perceptions across the Pre- and Post-Intervention Data Collection points are reported in Table 4.29. The mean scores for the seven dimensions ranged from 3.19 to 3.37 in 2017, and 3.22 to 3.35 in 2018. The standard deviations reported show no unexpected results.

Table 4.29 Descriptive Statistics of NOSACQ-50 Dimensions Between Survey Years

	Survey Year	Mean	Std. Deviation	N
NOSACQ_Dim1	2017	3.2642	.56095	156
	2018	3.3505	.54890	155
	Total	3.3073	.55577	311
NOSACQ_Dim2	2017	3.2280	.52802	156
	2018	3.2470	.53311	155
	Total	3.2375	.52979	311
NOSACQ_Dim3	2017	3.1870	.57528	156
	2018	3.2183	.53808	155
	Total	3.2026	.55637	311
NOSACQ_Dim4	2017	3.2468	.48581	156
	2018	3.3172	.45536	155
	Total	3.2819	.47144	311
NOSACQ_Dim5	2017	3.1932	.46970	156
	2018	3.2461	.50219	155
	Total	3.2196	.48610	311
NOSACQ_Dim6	2017	3.2989	.50012	156
	2018	3.3218	.49469	155
	Total	3.3103	.49675	311
NOSACQ_Dim7	2017	3.3672	.47091	156
	2018	3.3419	.47450	155
	Total	3.3546	.47211	311
NOSACQ_Mean	2017	3.2550	.43945	156
	2018	3.2918	.43378	155
	Total	3.2734	.43632	311

Multivariate analysis of variance of the NOSACQ-50

Levene's test was undertaken to test for equality between the groups' variances and tests the null hypothesis that the error variance of the dependent variable is equal across groups. Non-significant values suggest equal variances can be assumed. Examination of Levene's test confirmed *p*-values >0.05 for the equality of variance for the NOSACQ-50 means.

Box's test of equality of covariance to test the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups. Non-significant values suggest equal variances can be assumed. Examination of Box's test identified *p*-values <0.05 for the equality of covariance, suggesting the assumptions

are not met for the NOSACQ-50 means, Box's M= 64.12, p=0.000. A multivariate analysis of variance was conducted to compare the mean scores for each of the seven dimensions of the NOSACQ-50 survey instrument between the Pre- and Post-Intervention Data Collection points. The results are presented in Table 4.30, indicating no statistically significant difference between the means across the two data collection points.

Table 4.30 NOSACQ-50 ANOVA Between Survey Years

Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[i]
NOSACQ_Dim1	.579	1	.579	1.880	.171	.006	1.880	.277
NOSACQ_Dim2	.028	1	.028	.100	.753	.000	.100	.061
NOSACQ_Dim3	.076	1	.076	.246	.620	.001	.246	.078
NOSACQ_Dim4	.385	1	.385	1.738	.188	.006	1.738	.260
NOSACQ_Dim5	.217	1	.217	.919	.338	.003	.919	.159
NOSACQ_Dim6	.041	1	.041	.165	.685	.001	.165	.069
NOSACQ_Dim7	.050	1	.050	.222	.638	.001	.222	.076
NOSACQ_Mean	.105	1	.105	.552	.458	.002	.552	.115

A multivariate analysis of variance was conducted to test the effect of respondent demographic profiles on the mean scores for each of the seven dimensions of the NOSACQ-50 survey instrument between the Pre- and Post-Intervention Data Collection points. The results are presented in Table 4.31, indicating no statistically significant difference between the means across the two data collection points.

Table 4.31 NOSACQ-50 ANOVA Between Survey Years with Independent Variables

	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[i]
Survey Year AND Gender	NOSACQ_Dim1	.553	1	.553	1.804	.180	.006	1.804	.268
	NOSACQ_Dim2	.024	1	.024	.086	.769	.000	.086	.060
	NOSACQ_Dim3	.067	1	.067	.216	.643	.001	.216	.075
	NOSACQ_Dim4	.368	1	.368	1.665	.198	.005	1.665	.251
	NOSACQ_Dim5	.207	1	.207	.878	.350	.003	.878	.154
	NOSACQ_Dim6	.036	1	.036	.145	.704	.000	.145	.067
	NOSACQ_Dim7	.050	1	.050	.221	.638	.001	.221	.076
Survey Year AND Role Type	NOSACQ_Dim1	.866	1	.866	3.021	.083	.010	3.021	.410
	NOSACQ_Dim2	.120	1	.120	.464	.496	.002	.464	.104
	NOSACQ_Dim3	.214	1	.214	.749	.387	.002	.749	.139
	NOSACQ_Dim4	.523	1	.523	2.440	.119	.008	2.440	.344
	NOSACQ_Dim5	.332	1	.332	1.456	.229	.005	1.456	.225
	NOSACQ_Dim6	.078	1	.078	.320	.572	.001	.320	.087
	NOSACQ_Dim7	.028	1	.028	.124	.725	.000	.124	.064

Table 4.31 (Continued)

	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[i]
Survey Year AND Employment Status	NOSACQ_Dim1	.566	1	.566	1.836	.176	.006	1.836	.272
	NOSACQ_Dim2	.026	1	.026	.092	.761	.000	.092	.061
	NOSACQ_Dim3	.074	1	.074	.237	.627	.001	.237	.077
	NOSACQ_Dim4	.392	1	.392	1.767	.185	.006	1.767	.263
	NOSACQ_Dim5	.216	1	.216	.913	.340	.003	.913	.159
	NOSACQ_Dim6	.041	1	.041	.165	.684	.001	.165	.069
	NOSACQ_Dim7	.047	1	.047	.209	.648	.001	.209	.074
Survey Year AND People Leader	NOSACQ_Dim1	.755	1	.755	2.528	.113	.008	2.528	.354
	NOSACQ_Dim2	.083	1	.083	.309	.578	.001	.309	.086
	NOSACQ_Dim3	.166	1	.166	.561	.454	.002	.561	.116
	NOSACQ_Dim4	.455	1	.455	2.069	.151	.007	2.069	.300
	NOSACQ_Dim5	.300	1	.300	1.296	.256	.004	1.296	.206
	NOSACQ_Dim6	.071	1	.071	.291	.590	.001	.291	.084
	NOSACQ_Dim7	.030	1	.030	.135	.714	.000	.135	.065
Survey Year AND Leader Role	NOSACQ_Dim1	.177	1	.177	.817	.368	.006	.817	.146
	NOSACQ_Dim2	.026	1	.026	.136	.713	.001	.136	.065
	NOSACQ_Dim3	.017	1	.017	.072	.789	.001	.072	.058
	NOSACQ_Dim4	.201	1	.201	1.177	.280	.008	1.177	.190
	NOSACQ_Dim5	.286	1	.286	1.360	.246	.009	1.360	.212
	NOSACQ_Dim6	.155	1	.155	.741	.391	.005	.741	.137
	NOSACQ_Dim7	.271	1	.271	1.210	.273	.008	1.210	.194
Survey Year AND Work Group	NOSACQ_Dim1	.516	1	.516	1.677	.196	.005	1.677	.252
	NOSACQ_Dim2	.008	1	.008	.027	.868	.000	.027	.053
	NOSACQ_Dim3	.028	1	.028	.091	.763	.000	.091	.060
	NOSACQ_Dim4	.344	1	.344	1.549	.214	.005	1.549	.237
	NOSACQ_Dim5	.167	1	.167	.709	.400	.002	.709	.134
	NOSACQ_Dim6	.012	1	.012	.051	.822	.000	.051	.056
	NOSACQ_Dim7	.076	1	.076	.341	.559	.001	.341	.090
Survey Year AND Length of Service	NOSACQ_Dim1	.469	1	.469	1.521	.218	.005	1.521	.233
	NOSACQ_Dim2	.002	1	.002	.008	.930	.000	.008	.051
	NOSACQ_Dim3	.007	1	.007	.024	.878	.000	.024	.053
	NOSACQ_Dim4	.257	1	.257	1.163	.282	.004	1.163	.189
	NOSACQ_Dim5	.152	1	.152	.644	.423	.002	.644	.126
	NOSACQ_Dim6	.008	1	.008	.033	.857	.000	.033	.054
	NOSACQ_Dim7	.068	1	.068	.305	.581	.001	.305	.085
Survey Year AND Age	NOSACQ_Dim1	.629	1	.629	2.042	.154	.007	2.042	.297
	NOSACQ_Dim2	.044	1	.044	.155	.694	.001	.155	.068
	NOSACQ_Dim3	.061	1	.061	.197	.657	.001	.197	.073
	NOSACQ_Dim4	.384	1	.384	1.725	.190	.006	1.725	.258
	NOSACQ_Dim5	.263	1	.263	1.116	.292	.004	1.116	.184
	NOSACQ_Dim6	.049	1	.049	.196	.658	.001	.196	.073
	NOSACQ_Dim7	.044	1	.044	.195	.659	.001	.195	.072
Survey Year AND Mean ALI	NOSACQ_Dim1	.646	1	.646	3.531	.061	.011	3.531	.465
	NOSACQ_Dim2	.053	1	.053	.317	.574	.001	.317	.087
	NOSACQ_Dim3	.095	1	.095	.491	.484	.002	.491	.108
	NOSACQ_Dim4	.408	1	.408	2.371	.125	.008	2.371	.336
	NOSACQ_Dim5	.245	1	.245	1.285	.258	.004	1.285	.204
	NOSACQ_Dim6	.054	1	.054	.299	.585	.001	.299	.085
	NOSACQ_Dim7	.051	1	.051	.274	.601	.001	.274	.082

4.4.3 Safety Performance

As described in Section 3.5.2, the safety performance metrics were extracted from the Company's safety reporting system for the Pre- and Post-Intervention Data Collection points. These safety performance metrics were grouped into three

categories: Safety Compliance, Safety Participation, and Occupational Injuries. This section reports the variance between the Pre-Intervention and Post-Intervention Data Collection points.

Table 4.32 provides an overview of the safety performance metrics by workgroup for both the Pre- and Post-Intervention Data Collection points. Workgroups active across data collection points were included in the extraction of performance metrics, regardless of the presence of any safety performance metrics. Workgroups with missing data in either/both data collection points were excluded from further analysis.

Table 4.32 Comparison of Safety Performance Between Survey Years by Work Group

Work Group	Survey Year	Com WSR	Com Inc	Com NM	Com Hazard	Par WSRC	Par HAZC	Par SC	Par SCC	Inj TRI	Inj All	NOSACQ	ALI
Alpha	2017	.00	.00	.00	10.00	.00	1.00	34.00	3.00	.00	.00	3.05	4.03
	2018	.00	1.00	.00	.00	.00	.00	5.00	1.00	.00	1.00	3.08	2.70
Bravo	2017	123.00	40.00	9.00	106.00	15.00	40.00	3045.00	46.00	1.00	7.00	3.22	4.01
	2018	8.00	10.00	1.00	14.00	4.00	8.00	2112.00	28.00	1.00	5.00	3.19	3.77
Charlie	2017	6.00	5.00	3.00	111.00	2.00	10.00	219.00	11.00	.00	1.00	3.58	4.29
	2018	2.00	3.00	.00	93.00	2.00	11.00	166.00	9.00	.00	1.00	3.52	4.12
Delta	2017	.00	3.00	.00	15.00	.00	6.00	250.00	21.00	.00	1.00	3.29	3.85
	2018	20.00	5.00	1.00	6.00	3.00	6.00	286.00	20.00	1.00	4.00	3.27	3.86
Echo	2017	.00	23.00	3.00	4.00	.00	1.00	68.00	10.00	1.00	14.00	3.00	3.67
	2018	24.00	25.00	8.00	6.00	2.00	6.00	522.00	21.00	.00	12.00	3.09	3.52
Foxtrot	2017	6.00	1.00	.00	42.00	1.00	6.00	81.00	8.00	.00	.00	3.53	3.88
	2018	6.00	6.00	.00	7.00	1.00	4.00	204.00	10.00	.00	4.00	3.10	3.33
Golf	2017	.	.	.	.	.	.	.	.	.	.	.	.
	2018	38.00	16.00	6.00	95.00	4.00	33.00	424.00	38.00	.00	3.00	3.38	4.24
Hotel	2017	.	.	.	.	.	.	.	.	.	.	.	.
	2018	.	.	.	.	.	.	.	.	.	.	.	.
India	2017	3.00	2.00	.00	43.00	2.00	7.00	39.00	5.00	.00	1.00	2.97	2.69
	2018	5.00	4.00	1.00	39.00	3.00	9.00	46.00	7.00	.00	1.00	3.19	3.70
Juliet	2017	.	.	.	.	.	.	.	.	.	.	.	.
	2018	.	.	.	.	.	.	.	.	.	.	.	.
Kilo	2017	.00	.00	.00	.00	.00	.00	8.00	4.00	.00	.00	.	.
	2018	24.00	15.00	6.00	3.00	2.00	3.00	295.00	10.00	.00	3.00	3.58	4.23
Lima	2017	.00	.00	.00	8.00	.00	7.00	11.00	5.00	.00	.00	3.29	4.03
	2018	1.00	1.00	.00	6.00	1.00	2.00	15.00	4.00	.00	.00	3.34	3.93
Mike	2017	35.00	18.00	4.00	112.00	7.00	20.00	205.00	16.00	1.00	5.00	3.51	4.54
	2018	163.00	41.00	22.00	396.00	14.00	33.00	490.00	25.00	.00	9.00	3.18	3.82
November	2017	20.00	1.00	.00	28.00	2.00	8.00	154.00	6.00	.00	.00	3.52	4.43
	2018	25.00	.00	.00	11.00	3.00	7.00	161.00	5.00	.00	.00	3.80	4.78
Oscar	2017	7.00	17.00	10.00	44.00	4.00	16.00	64.00	10.00	.00	2.00	3.18	3.88
	2018	1.00	.00	.00	3.00	2.00	2.00	8.00	1.00	.00	.00	.	.
Papa	2017	.	.	.	.	.	.	.	.	.	.	.	.
	2018	.	.	.	.	.	.	.	.	.	.	.	.
Quebec	2017	45.00	11.00	3.00	20.00	3.00	12.00	186.00	13.00	.00	1.00	3.40	3.40
	2018	9.00	3.00	.00	21.00	2.00	10.00	104.00	14.00	.00	.00	.	.
Romeo	2017	.	.	.	.	.	.	.	.	.	.	.	.
	2018	.	.	.	.	.	.	.	.	.	.	.	.
Zulu	2017	.	.	.	.	.	.	.	.	.	.	.	.
	2018	.	.	.	.	.	.	.	.	.	.	.	.

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Variance between Pre- and Post-Intervention Safety Performance

A negative binomial regression was undertaken on the safety performance metrics in SPSS using the Generalised Linear Model, as recommended by Kremelberg (2011), to assess the change between the Pre- and Post-Intervention Data Collection periods. A negative binomial regression was determined to be the best method of analysis for the safety performance metrics as the distribution of count data is non-continuous and is limited to discrete non-negative values. The results of the negative binomial analysis for the study are reported below.

Safety Performance Change between 2017 and 2018

Goodness of fit test. The test of fit to the negative binomial model is presented in Table 4.33, Table 4.34, and Table 4.35 for the three groups of safety performance metrics, indicating goodness of fit to the model.

Table 4.33 Negative Binominal Regression Goodness of Fit Test Safety Compliance

	Goodness of Fit Criteria	Value	df	Value/df
Com W SR	Deviance	31.373	24	1.307
	Scaled Deviance	31.373	24	
	Pearson Chi-Square	30.050	24	1.252
	Scaled Pearson Chi-Square	30.050	24	
	Log Likelihood[b]	-101.778		
	Akaike's Information Criterion (AIC)	209.557		
	Finite Sample Corrected AIC (AICC)	210.600		
	Bayesian Information Criterion (BIC)	213.444		
	Consistent AIC (CAIC)	216.444		
Com_Inc	Deviance	30.913	24	1.288
	Scaled Deviance	30.913	24	
	Pearson Chi-Square	22.176	24	.924
	Scaled Pearson Chi-Square	22.176	24	
	Log Likelihood[b]	-86.666		
	Akaike's Information Criterion (AIC)	179.333		
	Finite Sample Corrected AIC (AICC)	180.376		
	Bayesian Information Criterion (BIC)	183.220		
	Consistent AIC (CAIC)	186.220		
Com N M	Deviance	24.456	24	1.019
	Scaled Deviance	24.456	24	
	Pearson Chi-Square	18.558	24	.773
	Scaled Pearson Chi-Square	18.558	24	
	Log Likelihood[b]	-54.019		
	Akaike's Information Criterion (AIC)	114.037		
	Finite Sample Corrected AIC (AICC)	115.081		
	Bayesian Information Criterion (BIC)	117.925		
	Consistent AIC (CAIC)	120.925		
Com Ha zard	Deviance	32.769	24	1.365
	Scaled Deviance	32.769	24	
	Pearson Chi-Square	37.647	24	1.569
	Scaled Pearson Chi-Square	37.647	24	
	Log Likelihood[b]	-127.336		
	Akaike's Information Criterion (AIC)	260.673		
	Finite Sample Corrected AIC (AICC)	261.716		
	Bayesian Information Criterion (BIC)	264.560		
	Consistent AIC (CAIC)	267.560		

Table 4.34 Negative Binominal Regression Goodness of Fit Test Safety Participation

	Goodness of Fit Criteria	Value	df	Value/df
Par_WSRC	Deviance	29.716	24	1.238
	Scaled Deviance	29.716	24	
	Pearson Chi-Square	35.174	24	1.466
	Scaled Pearson Chi-Square	35.174	24	
	Log Likelihood[b]	-60.068		
	Akaike's Information Criterion (AIC)	126.136		
	Finite Sample Corrected AIC (AICC)	127.180		
	Bayesian Information Criterion (BIC)	130.024		
	Consistent AIC (CAIC)	133.024		
Par_HAZC	Deviance	30.761	24	1.282
	Scaled Deviance	30.761	24	
	Pearson Chi-Square	29.387	24	1.224
	Scaled Pearson Chi-Square	29.387	24	
	Log Likelihood[b]	-90.144		
	Akaike's Information Criterion (AIC)	186.287		
	Finite Sample Corrected AIC (AICC)	187.331		
	Bayesian Information Criterion (BIC)	190.175		
	Consistent AIC (CAIC)	193.175		
Par_SC	Deviance	33.572	24	1.399
	Scaled Deviance	33.572	24	
	Pearson Chi-Square	56.640	24	2.360
	Scaled Pearson Chi-Square	56.640	24	
	Log Likelihood[b]	-180.470		
	Akaike's Information Criterion (AIC)	366.940		
	Finite Sample Corrected AIC (AICC)	367.983		
	Bayesian Information Criterion (BIC)	370.827		
	Consistent AIC (CAIC)	373.827		
Par_SCC	Deviance	28.792	24	1.200
	Scaled Deviance	28.792	24	
	Pearson Chi-Square	30.077	24	1.253
	Scaled Pearson Chi-Square	30.077	24	
	Log Likelihood[b]	-95.369		
	Akaike's Information Criterion (AIC)	196.739		
	Finite Sample Corrected AIC (AICC)	197.782		
	Bayesian Information Criterion (BIC)	200.626		
	Consistent AIC (CAIC)	203.626		

Table 4.35 Negative Binominal Regression Goodness of Fit Test Occupational Injuries

	Goodness of Fit Criteria	Value	df	Value/df
Inj_TRI	Deviance	16.582	24	.691
	Scaled Deviance	16.582	24	
	Pearson Chi-Square	22.000	24	.917
	Scaled Pearson Chi-Square	22.000	24	
	Log Likelihood[b]	-13.291		
	Akaike's Information Criterion (AIC)	32.582		
	Finite Sample Corrected AIC (AICC)	33.625		
	Bayesian Information Criterion (BIC)	36.469		
	Consistent AIC (CAIC)	39.469		
Inj_All	Deviance	28.520	24	1.188
	Scaled Deviance	28.520	24	
	Pearson Chi-Square	25.827	24	1.076
	Scaled Pearson Chi-Square	25.827	24	
	Log Likelihood[b]	-58.084		
	Akaike's Information Criterion (AIC)	122.167		
	Finite Sample Corrected AIC (AICC)	123.211		
	Bayesian Information Criterion (BIC)	126.055		
	Consistent AIC (CAIC)	129.055		

Table 4.36 reports the negative binomial regression test of the model as a whole, comparing the variance in safety performance between the Pre- and Post-Intervention Data Collection points.

Table 4.36 Negative Binominal Regression of Change in Safety Performance – Omnibus Test

	Likelihood Ratio Chi-Square	df	Sig.
Com WSR	.109	1	.741
Com Inc	.000	1	.996
Com NM	.125	1	.724
Com Hazard	.119	1	.730
Par WSRC	.059	1	.808
Par HAZC	.039	1	.844
Par SC	.003	1	.955
Par SCC	.169	1	.681
Inj TRI	b		
Inj All	.167	1	.683

a. Compares the fitted model against the intercept-only model.
b. Unable to compute the initial model log likelihood due to numerical problems.

The likelihood ratio chi-square provides a test of the overall model comparing this model to a model without any predictors. A p-value <0.05 indicates that the model is a significant improvement. With p-values >0.05, there is no statistically significant difference between the safety performance metrics across the two data collection points.

Bivariate Correlational Change between 2017 and 2018

Bivariate correlational analysis was reported on the safety performance metrics, the mean NOSACQ-50 score, and the mean ALI scores for both the Pre-Intervention (Section 4.2.6) and Post-Intervention (Section 4.3.6) Data Collection. Both datasets demonstrated considerable cross-correlations between Safety Compliance and Safety Participation measures and the two Occupational Injuries metrics. The mean NOSACQ-50 and ALI were only statistically significantly correlated internally between themselves.

Comparing the Pre- and Post-Intervention correlations show an increasing strength of the correlations between all the Safety Compliance metrics, all at the 0.01 significance level in the Post-Intervention dataset. Safety Participation metrics generally decreased the correlations between all variables, where all except four pairs of variables returned no statistically significant correlations. Likewise, Occupational Injuries generally decreased their correlations with other variables. The correlation between ALI and NOSACQ-50 variables showed an increase in the

strength of the correlations between the two instruments, at the 0.01 significance level in the Post-Intervention dataset.

4.4.4 Relationship Between Variables

NOSACQ-50 and ALI as a Predictor of Change in Safety Performance

Negative binomial regression was undertaken on the safety performance metrics in SPSS using the Generalised Linear Model as recommended by Kremelberg (2011) to assess the change between the Pre- and Post-Intervention Data Collection periods with the mean NOSACQ-50 and ALI scores as predictors. The results of the negative binomial analysis for the current study are reported below.

Safety Compliance

Table 4.37 reports the negative binomial regression test of the model as a whole, comparing the variance in Safety Compliance metrics between the Pre- and Post-Intervention Data Collection points, moderating for the effect of NOSACQ-50 and ALI. The chi-square provides a test of the overall model comparing this model to a model without any predictors. A p-value <0.05 indicates that the model is a statistically significant improvement.

Table 4.37 Safety Compliance Negative Binomial Test of Model Effects

		Type III		
	Source	Wald Chi-Square	df	Sig.
Com_WSR	(Intercept)	.247	1	.619
	Survey Year	.054	1	.816
	NOSACQ-50 Mean	.352	1	.553
	ALI Mean	1.316	1	.251
Com_Inc	(Intercept)	4.457	1	.035
	Survey Year	.035	1	.852
	NOSACQ-50 Mean	4.749	1	.029
	ALI Mean	3.082	1	.079
Com_NM	(Intercept)	1.050	1	.306
	Survey Year	.231	1	.631
	NOSACQ-50 Mean	2.425	1	.119
	ALI Mean	2.309	1	.129
Com_Hazard	(Intercept)	.924	1	.336
	Survey Year	.032	1	.859
	NOSACQ-50 Mean	.624	1	.429
	ALI Mean	1.945	1	.163

While there were no statistically significant changes in Safety Compliance metrics between the Pre- and Post-Intervention data collection points, it was noted that the mean NOSACQ score was a statistically significant predictor [Exp(B)=.029] of the number of incidents reported over this period (B=-3.643, S.E.=1.6715, p=.029), as per Table 4.38, suggesting that for each one-unit increase in the mean NOSACQ-50

score, the expected log count of the number of incidents reported decreases by a factor of 3.643.

Table 4.38 Safety Compliance: Incidents Reported – Negative Binomial Parameter Estimates

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test			Exp(B)	95% Wald Confidence Interval for Exp(B)	
			Lower	Upper	Wald Chi-Square	df	Sig.		Lower	Upper
(Intercept)	8.899	4.2570	.555	17.242	4.370	1	.037	7322.471	1.742	30778204.363
[Survey Year=2.00]	.088	.4710	-.835	1.011	.035	1	.852	1.092	.434	2.749
[Survey Year=1.00]	0[a]	.	.	.	.	.	.	1	.	.
NOSACQ-50 Mean	-3.643	1.6715	-6.919	-.366	4.749	1	.029	.026	.001	.693
ALI Mean	1.371	.7809	-.160	2.901	3.082	1	.079	3.939	.853	18.201
(Scale)	1[b]									
(Negative binomial)	1.201	.3856	.640	2.253						

a. Set to zero because this parameter is redundant.
b. Fixed at the displayed value.

Safety Participation

Table 4.39 reports the negative binomial regression test of the model as a whole, comparing the variance in Safety Participation metrics between the Pre- and Post-Intervention Data Collection points, moderating for the effect of NOSACQ-50 and ALI. The chi-square provides a test of the overall model comparing this model to a model without any predictors. A p-value <0.05 indicates that the model is a statistically significant improvement.

Table 4.39 Safety Participation Negative Binomial Test of Model Effects

	Source	Type III Wald Chi-Square	df	Sig.
Par_WSRC	(Intercept)	.727	1	.394
	Survey Year	.076	1	.782
	NOSACQ-50 Mean	1.812	1	.178
	ALI Mean	3.352	1	.067
Par_HAZC	(Intercept)	.743	1	.389
	Survey Year	.183	1	.669
	NOSACQ-50 Mean	1.249	1	.264
	ALI Mean	4.163	1	.041
Par_SC	(Intercept)	6.601	1	.010
	Survey Year	.098	1	.755
	NOSACQ-50 Mean	6.231	1	.013
	ALI Mean	6.714	1	.010
Par_SCC	(Intercept)	3.760	1	.052
	Survey Year	.203	1	.652
	NOSACQ-50 Mean	3.426	1	.064
	ALI Mean	4.769	1	.029

While there were no statistically significant changes in Safety Participation metrics between the Pre- and Post-Intervention data collection points, it was noted that the mean NOSACQ and ALI scores were a statistically significant predictor of the number of Contributors to Hazard Reporting, and Safety Conversations, as well as the total number of Safety Conversations recorded.

While there was no statistically significant change in the number of Hazard Contributors reported between Pre- and Post-Intervention (B=-.152, S.E.=.3543, p=.669), the mean ALI score was a statistically significant predictor [Exp(B)=3.285] of the number of hazard contributors over this period (B=1.189, S.E.=.5829, p=.041), as per Table 4.40, suggesting that for each one-unit increase in the mean ALI score, the expected log count of the number of people contributing to hazard reporting increases by a factor of 1.198.

Table 4.40 Safety Participation: Hazard Contributors– Negative Binomial Parameter Estimates

			95% Wald Confidence Interval		Hypothesis Test				95% Wald Confidence Interval for Exp(B)	
Parameter	B	Std. Error	Lower	Upper	Wald Chi-Square	df	Sig.	Exp(B)	Lower	Upper
(Intercept)	2.980	3.3874	-3.660	9.619	.774	1	.379	19.682	.026	15047.146
[Survey Year=2.00]	-.152	.3543	-.846	.543	.183	1	.669	.859	.429	1.721
[Survey Year=1.00]	0	.	.	.	.	.	.	1	.	.
NOSACQ-50 Mean	-1.573	1.4080	-4.333	1.186	1.249	1	.264	.207	.013	3.275
ALI Mean	1.189	.5829	.047	2.332	4.163	1	.041	3.285	1.048	10.297
(Scale)	1									
(Negative binomial)	.627	.2075	.328	1.199						

a. Set to zero because this parameter is redundant.
b. Fixed at the displayed value.

While there was no statistically significant change in the number of Safety Conversations reported between Pre- and Post-Intervention (B=.152, S.E.=.4865, p=.755), the mean NOSACQ-50 score was a statistically significant predictor [Exp(B)=.012] of the number of safety conversations reported over this period (B=-4.439, S.E.=1.7784, p=.013), as per Table 4.41, suggesting that for each one-unit increase in the mean NOSACQ-50 score, the expected log count of the number of Safety Conversations recorded decreases by a factor of 4.439.

Conversely, the mean ALI score was a statistically significant predictor [Exp(B)=9.094] of the number of safety conversations reported over this period

(B=2.208, S.E.=.8520, p=.010), as per Table 4.41, suggesting that for each one-unit increase in the mean ALI score, the expected log count of the number of safety conversations reported increases by a factor of 2.208.

Table 4.41 Safety Participation: Safety Conversations Recorded – Negative Binomial Parameter Estimates

			95% Wald Confidence Interval		Hypothesis Test				95% Wald Confidence Interval for Exp(B)	
Parameter	B	Std. Error	Lower	Upper	Wald Chi-Square	df	Sig.	Exp(B)	Lower	Upper
(Intercept)	11.807	4.6620	2.669	20.944	6.414	1	.011	134141.182	14.430	1246961757.849
[Survey Year=2.00]	.152	.4865	-.801	1.106	.098	1	.755	1.164	.449	3.021
[Survey Year=1.00]	0	.	.	.	.	.	.	1	.	.
NOSACQ-50 Mean	-4.439	1.7784	-7.924	-.953	6.231	1	.013	.012	.000	.385
ALI Mean	2.208	.8520	.538	3.877	6.714	1	.010	9.094	1.712	48.303
(Scale)	1									
(Negative binomial)	1.380	.3428	.848	2.245						

a. Set to zero because this parameter is redundant.
b. Fixed at the displayed value.

While there was no statistically significant change in the number of Safety Conversation Contributors reported between Pre- and Post-Intervention (B=.129, S.E.=.2857, p=.652), the mean ALI score was a statistically significant predictor [Exp(B)=2.968] of the number of safety conversation contributors over this period (B=1.088, S.E.=.4982, p=.029), as per Table 4.42, suggesting that for each one-unit increase in the mean ALI score, the expected log count of the number of people contributing to Safety Conversations reported increases by a factor of 1.088.

Table 4.42 Safety Participation: Safety Conversations Contributors – Negative Binomial Parameter Estimates

			95% Wald Confidence Interval		Hypothesis Test				95% Wald Confidence Interval for Exp(B)	
Parameter	B	Std. Error	Lower	Upper	Wald Chi-Square	df	Sig.	Exp(B)	Lower	Upper
(Intercept)	5.178	2.7206	-.155	10.510	3.622	1	.057	177.274	.857	36677.537
[Survey Year=2.00]	.129	.2857	-.431	.689	.203	1	.652	1.137	.650	1.991
[Survey Year=1.00]	0	.	.	.	.	.	.	1	.	.
NOSACQ-50 Mean	-2.080	1.1236	-4.282	.122	3.426	1	.064	.125	.014	1.130
ALI Mean	1.088	.4982	.111	2.064	4.769	1	.029	2.968	1.118	7.880
(Scale)	1									
(Negative binomial)	.405	.1349	.211	.778						

a. Set to zero because this parameter is redundant.
b. Fixed at the displayed value.

Occupational Injuries

Table 4.43 reports the negative binomial regression test of the model as a whole, comparing the variance in Occupational Injuries metrics between the Pre- and Post-Intervention Data Collection points, moderating for the effect of NOSACQ-50 and ALI. The chi-square provides a test of the overall model comparing this model to a model without any predictors. A p-value <0.05 indicates that the model is a statistically significant improvement.

Table 4.43 Occupational Injuries Negative Binomial Test of Model Effects

	Source	Type III Wald Chi-Square	df	Sig.
Inj_TRI	(Intercept)	.586	1	.444
	Survey Year	.024	1	.876
	NOSACQ-50 Mean	2.169	1	.141
	ALI Mean	1.517	1	.218
Inj_All	(Intercept)	13.326	1	.000
	Survey Year	1.914	1	.167
	NOSACQ-50 Mean	11.838	1	.001
	ALI Mean	5.186	1	.023

While there were no statistically significant changes in Occupational Injuries metrics between the Pre- and Post-Intervention data collection points, it was noted that the mean NOSACQ score was a statistically significant predictor [Exp(B)=.002] of the number of All Injuries reported over this period (B=-5.993, S.E.=1.7418, p=.001), as per Table 4.44, suggesting that for each one-unit increase in the mean NOSACQ-50 score, the expected log count of the number of all injuries recorded decreases by a factor of 5.993.

Conversely, the mean ALI score was a statistically significant predictor [Exp(B)=6.115] of the number of All Injuries reported over this period (B=1.811, S.E.=.7951, p=.023), as per Table 4.44, suggesting that for each one-unit increase in the mean ALI score, the expected log count of the number of all injuries recorded increases by a factor of 1.811.

Table 4.44 Occupational Injuries: All Injuries – Negative Binomial Parameter Estimates

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test			Exp(B)	95% Wald Confidence Interval for Exp(B)	
			Lower	Upper	Wald Chi-Square	df	Sig.		Lower	Upper
(Intercept)	13.324	3.7119	6.048	20.599	12.884	1	.000	611487.711	423.430	88306730 2.208
[Survey Year=2.00]	.599	.4327	-.250	1.447	1.914	1	.167	1.820	.779	4.249
[Survey Year=1.00]	0	.	.	.	.	.	.	1	.	.
NOSACQ-50 Mean	-5.993	1.7418	-9.407	-2.579	11.838	1	.001	.002	8.215E-5	.076
ALI Mean	1.811	.7951	.252	3.369	5.186	1	.023	6.115	1.287	29.049
(Scale)	1									
(Negative binomial)	.570	.2983	.204	1.590						

a. Set to zero because this parameter is redundant.
b. Fixed at the displayed value.

4.5 DISCUSSION ON QUANTITATIVE FINDINGS

Authentic Leadership

The mean Pre-Intervention scores for the four ALI dimensions ranged from 3.73 to 3.94, and the mean Post-Intervention scores ranged from 3.85 to 4.07, out of a maximum score of 5.00, as presented in Table 4.26. A multivariate analysis of variance indicated that there was no statistically significant difference between the means of the ALI scores between the Pre- and Post-Intervention data collection points.

Analysis of variance (ANOVA) was conducted to compare the effect of respondent demographic profiles on the mean ALI score in both the Pre- and Post-Intervention data sets (refer Table 4.5 and Table 4.17, respectively). The effect of *Role Type* on the Pre- and Post-Intervention mean ALI score was statistically significant indicating that the mean ALI score of those respondents in Salaried/Administrative roles is statistically higher than that of Trades/Labour roles. The effect of *People Leader* on the mean ALI score was also statistically significant in the Post-Intervention data set indicating that the mean ALI score of those respondents identifying as People Leaders is statistically higher than those not identifying as People Leaders.

This finding that Office Workers in both the Pre- and Post-Intervention dataset, and People Leaders in the Post-Intervention dataset perceive their leaders as being more authentic than Trades-Based Workers and non-people leaders, respectively. These results support the findings of Chen, Li & Goh (2021) and Marín et al. (2019),

of discrepancies being observed in perceptions across different levels of the organisation, in this case between Salaried/Administrative and Trade/Labour roles, and People Leaders and Non-People Leaders.

Safety Climate

The mean Pre-Intervention scores for the seven NOSACQ-50 dimensions ranged from 3.23 to 3.35, and the mean Post-Intervention scores ranged from 3.17 to 3.37, out of a maximum score of 4.00, as reported in Table 4.29. Scores >3.30 indicate a good level of alignment to the safety climate model, and scores 3.00-3.30 require slight improvement. Several dimensions saw a reduction in the Post-Intervention mean score compared to the Pre-Intervention sample, with an additional two dimensions needing slight improvement, however multivariate analysis of variance indicated that there was no statistically significant difference between the means of the NOSACQ-50 scores between the Pre- and Post-Intervention data collection points.

Analysis of variance (ANOVA) was conducted to compare the effect of respondent demographic profiles on the mean NOSACQ-50 score in both the Pre- and Post-Intervention data sets (refer Table 4.8 and Table 4.20, respectively). The effect of both *Role Type* and *People Leader* on the Pre- and Post-Intervention mean NOSACQ-50 score was significant, indicating that the mean NOSACQ-50 score of those respondents in Salaried/Administrative roles, and those respondents identifying as People Leaders, is statistically higher than that of Trades/Labour roles, and those not identifying as People Leaders.

This finding confirms that Office Workers and People Leaders in both the Pre- and Post-Intervention datasets perceive the Company's safety climate as more positive than Trades-Based Workers and non-people leaders, respectively. Similarly to the Authentic Leadership results, these findings support the literature observations of hierarchical discrepancies in perception across the organisation.

Safety Performance

Safety performance metrics for the Company were grouped into three categories: Safety Compliance, Safety Participation, and Occupational Injuries. While there were observable improvements in many of the safety performance metrics

across these groupings, negative binomial regression indicated that there were no statistically significant difference between the safety performance metrics across the Pre- and Post-Intervention data points.

Analysis of the relationship between ALI and the NOSACQ-50 mean scores and the safety performance metrics identified several statistically significant predictor effects. The mean ALI was a significant predictor of the number of contributors to hazard reporting and safety conversations, the number of safety conversations reported, and the total number of injuries reported within the workgroups. The mean NOSACQ-50 score was a significant predictor of the number of contributors to the number of incidents reported, the number of safety conversations recorded, and the total number of injuries reported within the workgroups. These finding support the view that a positive safety climate is an essential predictor of safety performance (Wu, T.-C. et al. 2008), and provided additional evidence that "a positive safety climate maintains safety-related behaviors" (Clarke 2006, p. 316).

4.6 CONCLUSION

This chapter described how the quantitative data was prepared and analysed to partially address the study's research questions. The data from the Pre- and Post-Intervention surveys were examined for missing data, outliers, and normality. The demographic characteristics of the respondents were reported as descriptive statistics. The Pre- and Post-Intervention ALI and NOSACQ-50 survey instruments were independently examined through EFA and ANOVA. The relationships between the demographic characteristics, ALI, NOSCAQ-50, and Safety Performance metrics were then examined through Bivariate Correlational Analysis.

The change between the Pre- and Post-Intervention data was examined through MANOVA, Negative Binomial Regression, and Bivariate Correlational Analysis. While there was no statistically significant change between the Pre- and Post-Intervention ALI, NOSACQ-50 or Safety Performance metrics, the negative binomial regression indicated that the ALI and NOSCAQ-50 scores had a moderating effect on several of the Safety Performance metrics.

Increases in the mean ALI increased the number of people contributing to hazard reporting, increased the number of Safety Conversation recorded and the number of people contributing to Safety Conversation recording, and increased the number of all injuries reported. However, increases in the mean NOSACQ-50 decreased the number of incidents reported, decreased the number of Safety Conversation recorded, and decreased the number of all injuries reported.

The next chapter presents the findings of the qualitative data collected and proposes interpretations in relation to the research objectives.

CHAPTER 5 QUALITATIVE RESULTS & DISCUSSION

5.1 INTRODUCTION

The previous chapter described how the quantitative data was prepared and analysed to partially address the study's research questions. This chapter describes how the qualitative data was prepared and analysed to partially address the study's research questions. The results reported in this chapter will then be discussed as they relate to the research problem. The structure of this chapter is shown in Table 5.1.

Table 5.1 Structure of Chapter 5

Section	Content	
5.1	Introduction	
5.2	Quantitative Results	Data Preparation Participant Demographics
5.3	Thematic Analysis	Overview of Themes Theme 1: Authentically Leading Safety Theme 2: Empowered & Engaged Teams Theme 3: Safe Operational Outcomes
5.4	Summary of Findings	Project Interventions Intervention Impact on Safety Performance
5.5	Conclusion	

5.2 QUALITATIVE RESULTS

5.2.1 Participant Demographics

The study aimed to explain the possible relationship between Authentic Leadership and Safety Performance in the context of an Australian Facility Management Company. Following the Post-Intervention survey data collection, three focus groups were facilitated across key workgroups of the Company's Victorian/Tasmanian operations. Five semi-structured interviews with key informants were then conducted, with lines of enquiry formulated from the focus group responses. Demographic characteristics of the focus group and interview participants were collected at the same time as copies of the participant consent forms were completed.

Seventeen participants were purposively recruited to participate in the focus groups, with five key stakeholders invited to participate in the subsequent interviews. Of the 22 participants, sixteen were male, and six were females. For the purpose of anonymity, focus group participants were labelled as 'Participant B3', indicating they were the third participant to speak in Focus Group B. Key stakeholders were labelled 'Interviewee 1' based on the order the interviews were conducted. Table 5.2 summarises the participant's demographics for gender, age, role type, employment status, tenure, and people leadership role (if any).

Table 5.2 Focus Group and Interview Respondent Profiles

		Focus Group A	Focus Group B	Focus Group C	Focus Group Total	Interview
Gender	Male	7	2	3	12	4
	Female	1	3	1	5	1
	Prefer not to answer	0	0	0	0	0
	Total	8	5	4	17	5
Age	21 - 30	0	0	0	0	0
	31 - 40	1	1	0	2	1
	41 - 50	3	1	2	6	2
	51 - 60	1	1	2	4	1
	61 +	3	2	0	5	1
	Total	8	5	4	17	5
Role Type	Trades / Labour	1	0	2	3	0
	Salaried / Administration	7	5	2	14	5
	Total	8	5	4	17	5
Employment Status	Full Time	7	4	4	15	5
	Part Time	1	0	0	1	0
	Casual / Contract	0	1	0	1	0
	Total	8	5	4	17	5
Tenure	Less than 1 year	0	0	3	3	0
	1-2 years	2	1	0	3	2
	2-5 years	1	1	0	2	1
	5-10 years	2	3	1	6	1
	More than 10 years	3	0	0	3	1
	Total	8	5	4	17	5
People Leader	Yes	7	1	1	9	5
	No	1	4	3	8	0
	Total	8	5	4	17	5
Leadership Position	Executive Manager	0	0	0	0	1
	Contract / Regional Manager	0	0	0	0	2
	Operational / Functional Manager	2	1	1	4	1
	Coordinator / Supervisor	5	0	0	5	1
	Sub-Total	7	1	1	9	5
	Non-People Leader	1	4	3	8	0
	Total	8	5	4	17	5

Focus Groups

Focus Group A was conducted with workers from the 'Bravo' workgroup in the suburb of Brooklyn, Victoria. This workgroup is situated within the water operations and maintenance sector, with a predominantly male workforce. One participant in

this focus group identified as female, and their role was mainly office-based. The remaining participants, while identifying as salaried/administrative, undertook field supervisory roles within the workgroup, which reflects the high number of participants with people leadership positions in this focus group. Five of the eight participants had been with the Company for over five years, with three greater than ten years of service. Those workers identifying as coordinators/supervisors have transitioned into their roles following several years as trades-based workers in the civil plumbing industry.

Focus Group B was conducted with workers from the 'Kilo' workgroup in the suburb of Melbourne, Victoria. This workgroup is located within the support office of the Company, which comprises Sales, Finance, Call Centre, Procurement and Engineering functions. Most roles within this workgroup are considered salaried/administrative. The workgroup is predominantly a female workforce, with three of the five participants in this focus group identifying as female. Only one participant identified as being a people leader.

Focus Group C was conducted with workers from the 'Golf' workgroup in the suburb of Tullamarine, Victoria. This workgroup is situated within the aviation sector, with a predominantly male workforce. One participant in this focus group identified as female, and their role was mainly office-based. Two workers identified as trades-based workers, one a qualified electrician and the other a qualified plumber. Three of the four participants had been with the Company for less than one year, with one greater than five years of service. The worker identifying as a coordinator/supervisor has transitioned into their roles following several years as trades-based workers.

Key Stakeholder Interviews

Interviewee 1 was a Commercial Manager within the 'Golf' workgroup in the suburb of Tullamarine, Victoria, which provides facility management services to the aviation sector. The Commercial Manager looks after the finances of the contract and ensures compliance with their contractual obligations. Interviewee 1 identified as a 21-30-year-old female and had been with the Company for 2-5 years. Prior to working in the 'Golf' workgroup, she previously worked at the 'Bravo' workgroup as an Analyst and the 'Oscar' workgroup as a Commercial Manager.

Interviewee 2 was a Senior Contract Manager within the 'Bravo' workgroup in the suburb of Brooklyn, Victoria. The Senior Contract Manager looks after the delivery of operational and maintenance of water services for a large water retailer in Victoria. Interviewee 2 identified as a 31-40-year-old male and had been with the Company for 1-2 years. Before working in the 'Bravo' workgroup, he had approximately 18 years of experience in the water industry.

Interviewee 3 was a Facility Coordinator within the 'November' workgroup in the suburb of Mitcham, Victoria. The Facility Coordinator supervises the delivery of facility management activities, including contractors, within a large water retailer in Victoria. Interviewee 3 identified as a 51-60-year-old male and had been with the Company for over ten years. Interviewee 3 has over 20 years of experience in the facility management industry, both in Australia and UK.

Interviewee 4 was a Contract Manager within the 'Mike' workgroup in the suburb of Kilsyth, Victoria. The Contract Manager looks after the delivery of facility management activities, including contractors within a Residential Aged Care facility. Interviewee 4 identified as a 31-40-year-old male and had been with the Company for 1-2 years. Before working in the 'Mike' workgroup, he had approximately 15 years of experience as a qualified plumber.

Interviewee 5 was a General Manager within the 'Kilo' workgroup in the suburb of Melbourne, Victoria. The General Manager had operational accountability for all workgroups in the Victoria/Tasmania operations, with all contract managers of these workgroups reporting to him. Interviewee 5 identified as a 41-50-year-old male and had been with the Company for 2-5 years, and the last two years in the role of General Manager for the Victoria/Tasmania region.

5.2.2 Data Preparation

The qualitative data were primarily collected in the study through focus groups and interviews with key stakeholders to allow for further exploration and potential triangulation of trends observed from responses to the quantitative items of the survey questionnaire (Johnson & Onwuegbuzie 2004; Creswell 2014).

The qualitative data analysis followed Braun and Clarke's (2006) six phases of Thematic Analysis, as illustrated in Figure 3.8 (refer Section 3.5.3). The first phase of the analysis, familiarisation with the data, consisted of preparing the data for the subsequent analysis phases. The transcripts of all Focus Group and Key Stakeholder Interviews were transcribed verbatim using web-based automated transcription software, Sonix.ai, which provided highly accurate, time-stamped transcriptions. The researcher then reviewed these for quality and accuracy, manually checking the transcription against the audio files. A verbatim account included all words and pauses in the audio, with the adoption of punctuation to retain the sense of what the participants conveyed during the interviews. This process allowed the researcher to immerse themselves and maintain a deep familiarity with the data. The focus group and key informant interview transcripts are attached in Appendix L.

During phase two, the transcripts were read through in detail, and stimulating codes were noted using ATLAS.ti. As the transcripts were coded, key features became noticeable, and similarities and differences across each of the transcripts became apparent. Extracts of data were highlighted and noted, allowing for clustering according to their similarity, which eventually led to potential themes emerging in phase three. As the analysis moved into phase 4, the collection of eighteen themes were identified and distilled into three main themes with six subthemes each.

It is important to note that the data analysis was an iterative process (Denscombe 2007), with non-linear movement throughout all six phases, with a frequent revisiting of the transcripts and initial codes to ensure integrity.

5.3 THEMATIC ANALYSIS

The analysis suggests three distinct themes reflect the participants' perceptions related to the study: 'Authentically Leading Safety', 'Empowered & Engaged Teams', and 'Safe Operational Outcomes'. Each theme, and its subthemes, are subsequently described using quotes from across the focus groups and key stakeholder interviews.

5.3.1 Overview of the Main Themes

Through the focus groups and key stakeholder interviews, the participants described how safety leadership and safety climate are perceived within the

Company and how this relates to the Company's safety performance. Participants described how the Company's core values of 'Personal Safety Leadership' and 'Care & Empathy' are demonstrated across the workgroups. The thematic analysis of the focus groups and interviews identified 40 coded sets of data, as presented in Figure 5.1.

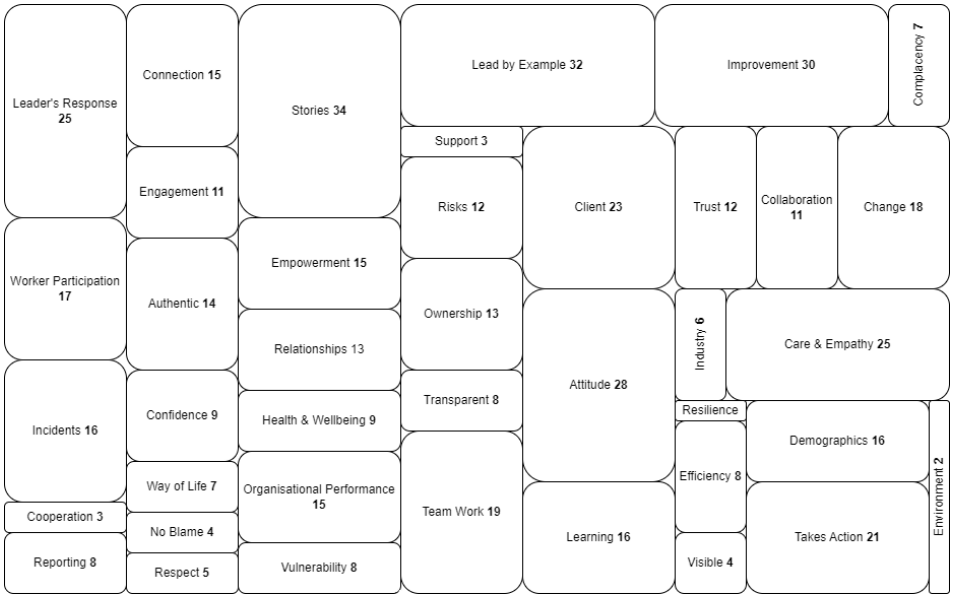

Figure 5.1 Treemap of Thematic Coding

From these 40 sets of coded qualitative data, eighteen clusters of subthemes emerged through analysis by the research while comparing and contrasting the text and details of the coded sets of data. There clusters were subsequently grouped into three main themes, namely 'Authentically Leading Safety', 'Empowered & Engaged Teams', and 'Safe Operational Outcomes', as presented in Figure 5.2.

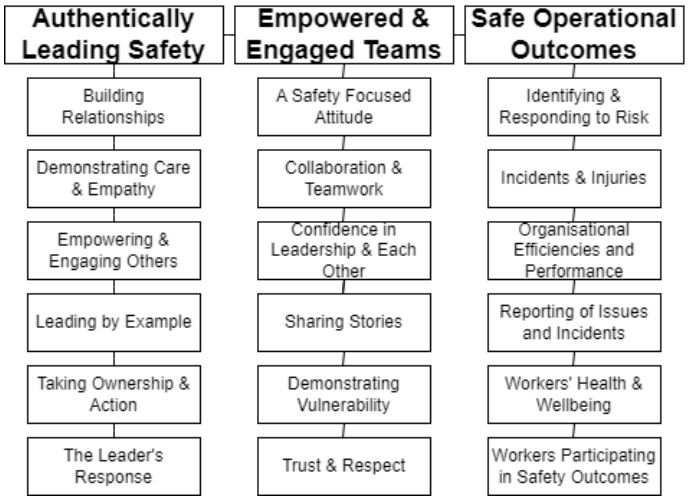

Figure 5.2 Thematic Map

5.3.2 Theme 1: Authentically Leading Safety

Participants discussed how leaders of the Company demonstrate safety leadership by sharing stories or examples of their managers or recounting examples of others. Some leaders who were interviewed also reflected on their own safety leadership. Participants described effective leaders as authentically leading safety within the Company as those who: build relationships, demonstrate care and empathy towards their workers, empower others and create worker engagement, lead by example, take ownership and action, respond openly and positively to safety issues throughout the Company.

The importance of leaders building relationships with their workers was highlighted in both the Focus Groups and Key Stakeholder Interviews and the perceived care and empathy demonstrated by authentic leadership, which highlighted alignment with the ALI dimensions of 'Relational Transparency' and 'Internalised Moral Perspective'.

> **Interviewee 1:** *I just find they really people focused. So, they'll ask if they're teams, what's wrong. And they'll always try and say, well, something from their perspective. And then they'll say, look, you know, I understand that this is the way we need to go about it. And I think they don't just say, no, you have to do this. You have to do that. It's very it's sort of a genuine type conversation, I feel, when they're speaking to a lot of the staff. It's different. I guess, you know, the demeanour is quite calm and, you know, they've got that empathy so good.*

> **Interviewee 4:** *One thing, again, I've noticed is the care. I would say caring for one as well. If even if it's personal, in our personal lives as well as on site, management have always been caring about the person.*

> **Interviewee 5:** *[A]s you get to know somebody in a more personal, and a deeper level, you know, the relationship grows stronger as well. So, your ability to work closely with that person, your ability to be able to perform together increases. So, I mean, it's not to be honest, it's not just the safety benefit, it's a benefit in delivering better operations. Because by working together more closely, by understanding who that person is and what makes*

them tick, they naturally work better, and they deliver it more productive, and they deliver a better service.

Several participants reflected on the need for leaders to be authentic when it comes to building relationships and empowering their teams:

> **Interviewee 1:** *I think you need to be authentic with all things to do... for me, I don't believe someone if they're not being authentic or if I think I've got ulterior motives.*
>
> **Participant C3:** *I think they really, truly have to believe in it.*
>
> **Participant C4:** *And as long as it doesn't look like a chore for them. Like they actually believe it.*
>
> **Interviewee 5:** *I would feel like we all have a story. We have something that shapes the person that you've become. You know mine was sort of shaped by dealing with a fatality when I was quite young in my career. So, I therefore saw the absolute worst thing that can happen, you know, when someone comes to work and then people having to, you know, tell their family that that person is never coming home again. And that sort of shaped my safety journey, and my story. And I try to share that story as much as possible because I think being open with your team and trying to explain why it's important, not just saying: it's important, because you can say a lot of things are important but it's about articulating why it's important. And I think that message has been quite strong and encouraged others to share their sort of stories, and I feel, so I guess that's how I try to lead.*

Interviewee 2 expanded on the importance of building relationships in the field and stressed that *how* leaders respond to issues is essential. For example, do workers get blamed for incidents, or is their openness to learning and improvement?

> **Interviewee 2:** *I do definitely believe it's boots on the ground but is building relationships. It's actually having an understanding how people operate on the ground. Everyone's different. Everyone has a purpose. If people get things wrong, that's okay. That we learn by that. I'm not one that... For on this*

contract, we do something wrong, we get it better. I don't fundamentally don't believe abating people gets the right outcome. It is about working with someone to improve their processes, getting the best outcome next time. So, I don't believe any fault is an individual unless it's plainly clear that the individuals done something dramatically wrong. But I definitely believe that most of our safety issues that contribute to process breakdown and then we always go back to the process and understand where did we get it wrong.

On how leaders respond to safety issues, Participant B2 also reflected on a story shared about one of the Company's senior executives who responded to a worker injury on an alliance project, emphasising the ALI dimension of 'Balanced Processing':

Participant B2: *But [he] stood up and said, you know what? That's not really how we behave. Sure, you did the wrong thing. But that's on us. We need to make sure that he has the right training and that everyone is… Is that the learnings from that are shared across the organisation. Yeah, and so they did. They kept him in. He was, used as an example is kind of the wrong phrase, but [he] kind of made sure that he wasn't blamed in that instance…*

This 'No Blame' approach was echoed by Focus Group participants and Key Informant interviewees, both in supporting and challenging it:

Participant A6: *Another good thing is I've realised the management reward good behaviour and I gives their guys more of an incentive to do better. So, like I know in the past, that like Bunnings vouchers and all that kind of stuff have been given out. Now I know it's only something small it gives something for the guys to look forward to. Even if it's just a pat on the back. Yeah. It shows them that they were doing a good job and they want to do better. That's what I've realised as well.*

Interviewee 1: *People tend to be scared when they think that they're going to be in trouble for doing something maybe incorrectly. So, I think it's important for people to know that, yes, they make mistakes. That's okay. They just need to admit it and work out a solution and fix it.*

Participant C4: *No one wants to point the finger at anybody after an incident. I think it's more about trying to make sure that we improve the systems and improve the processes, remove the hazards, whatever it requires, no expense spared sort of thing right to the top I think [he] leads by example there, and I think it's the total opposite in this site. But in general, I think that's a very common piece of feedback that you would get.*

Interviewee 3: *No blame. It's a good position to be in. But ultimately, even if there is no blame, people will feel blame by default.*

Focus Group participants also discussed the value of their management leading by example and empowering them to make decisions in the field:

Participant A1: *[W]e try very hard at the management level to have no titles. We're all just in here, we're all chipping in, we've all gotta cover each other's bums and backs and things when we need to and backfill, but we are trying to be, you know, without titles here, we're just getting done.*

Participant A1: *I think I think one of the things [Manager] did when he first came in, you guys would know about this necessarily, but he basically sat down with each of us and said, right, you're accountable for this manage it and then he'd support us and backed us to the hill for everything we wanted to do and where we were going to go off track. He gave us that guidance on maybe I wouldn't do that just yet. I would try this first. We've taken him at his word and done those things. And they've worked. So, he's empowered us to empower ourselves to go and make calls and make decisions, which we do.*

Participant C3: *I think they really, truly have to believe in it. Yeah, it's the kind of thing that moves well from the top down. If it's continuous. So, we always discuss it in the toolbox meetings, it's the first topic it's always a topic. We're required to do our safety talks. So, if you instil it as part of your day to day and you can see your manager leading that...then it really does flow down.*

Participant C4: *They really do instil safety. They lead by example. I think from that safety aside, is that professionalism that comes with that. It feels like a well-oiled sort of machine.*

Leading by example and empowering and engaging others also came out in the Key Informant interviews:

Interviewee 1: *[I]f you've got a leadership team who aren't thinking about safety or who aren't leading by example, it flows down to your workforce. If we take shortcuts, they're going to take shortcuts. And I think it's also a care factor, too. We are taking shortcuts then I think, well, maybe they don't care about my safety and well-being.*

Interviewee 1: *If a job is unsafe, you stop work. It's you know, we won't compromise on safety, if you believe that a task is not right.*

Interviewee 2: *I think having the right people in the right mindset, following the right processes and making them feel valued or empowered to make change, I think that's safety. And having the right culture drives that leadership on the ground.*

Some Focus Group Participants also provided reflections in contradiction to the safety leadership:

Participant A2: *[A] lot of stuff you put in place [for] safety comes back as a… it's just an arse covering exercise.*

Participant A1: *I don't think there is such a thing as safety leadership, to be honest… I think if you're a decent human being and know how to get on with people and know how to influence people, then how to get them to work with you… You get things done through people… I don't think safety is any different to operations, to HR, to IT, to problem solving out in the field. I actually think we're trying to create a bucket for safety leadership and I don't think it needs to exist.*

The analysis suggests that participants' examples and descriptions of the values, attributes, and behaviours centre around a theme of authentically leading safety, which led to empowered and engaged teams.

5.3.3 Theme 2: Empowered & Engaged Teams

The second emergent theme derived from the thematic analysis revolved around empowered and engaged teams. This theme comprised a safety-focused attitude, collaboration & teamwork, a sense of confidence in leadership & each other, leaders and others sharing stories and demonstrating vulnerability, and a sense of trust & respect. Participant discussion incorporated examples of how leaders of the Company empowered them within their workgroups and expressed a sense of engagement within their respective teams.

Focus Group A included a series of interactions from participants on worker attitude and mindset within the workgroup related to safety and worker engagement perceptions.

> **Participant A1:** *I think safety become less in your face here in the last twelve months. Six months. Three years. I just I'm looking at it's like we don't. You know, we don't try and splatter it around the walls anymore. It's just, it's just happening.*

> **Participant A4:** *I think that now we've moved on a little bit from the beginning. There's a more positive vibe about the crews, the job in general. Everybody's not so negative. You don't walk out there and everyone's head sort of slung down, walking around. People seem to be more positive and happier now I think.*

All five Key Stakeholder Interviews reiterated this theme in the semi-structured interviews:

> **Interviewee 1:** *I've got to admit safety culture is pretty good on this site. We have a workforce who are really engaged and who do point out when something is not quite right, they don't just walk past it. So, from that respect, we're really lucky that from management perspective, it's not sort of*

reinforcing safety every day. It's already in the mindset of our staff. It's just making sure that we also follow that example… I think it is just an engaged workforce, who think about task prior to doing it. So, they may not realize that, I know we drill this whole Safety is number one, or this and that, but I think a lot of the time it's common sense too. And a lot of people tend to think about things prior to starting so that they make sure that they're not going to hurt themselves.

Interviewee 2: *You can you can talk about safety leadership all you want, but it's the culture that drives the outcome. I think having the right people in the right mindset, following the right processes and making them feel valued or empowered to make change, I think that's safety. And having the right culture drives that leadership on the ground… I am a true believer that if people are in the right mindset, they'll do safety well, and it comes back to that culture piece.*

Interviewee 3: *[I]f you don't have that [safety] attitude, the contract won't be there because by default clients expect and require that high level of safety leadership attitude. And yes, I have seen it years ago at [the Company] when I first arrived here it was I'm a bit more loose and even back then, one or two people took ownership of safety and made some dramatic improvements and made it very, I won't say simple, but made the process simple and achievable.*

Interviewee 4: *Well, having the right safety conscious, I suppose, but having the right attitude towards safety. So, keep an eye out at all times and basically making sure everyone's safe. From contractors, residents all the way through the managers.*

Interviewee 5: *When you can reach that critical mass where you've got that people through the business where this is just what they know, it's you know, those people that provide those old school excuses the reasoning, they're just not accepted or tolerated by their peers. And I think we're sort of getting to that point within business. From a safety perspective I think that's quite exciting moving forward.*

However, reflections were also provided by some Focus Group Participants in contradiction to the safety-focused attitude of workers:

> **Participant A1:** *I think the guys are so well versed in what they do that they probably no longer see the risks… Doesn't mean they're belligerent. Doesn't mean they're lazy, doesn't mean they're complacent. [It] means they probably no longer see the risk. Or they've dealt with those hazards in the past and they've found a way to manage that hazard still in place. They've been doing it for so many years that they no longer worry about it. But you and I walk up and go, oh shit, look at that hazard! And they go, what hazard?*

> **Participant A3:** *There's been a lot of guys that were not willing to conform or change that have moved. We've moved on. They haven't moved on. [So] we've moved them on. And that makes a complete difference with people having trust in management, because that's purely the new culture coming into the place.*

Participants in the Focus Group and Key Stakeholder Interviews spoke about the importance of trust and respect within teams and from leaders:

> **Participant C2:** *It helps create just a confidence. You guys being confident in us, us being confident in management and knowing that we need your raise something you don't have to sort of whisper about it all. Mate just come straight out and say it if you do see it. Yeah. And create a sort of harmonious workplace where nobody's management or we are management and workers. But there's a there's no big divide. Everybody's respected if we come to them and say something.*

> **Interviewee 4:** *I suppose involving a trustworthy team where you can speak up and identify. It's something I've been big on. That if someone identifies a hazard, you don't brush it off and say. No, it's rubbish. It's taken. A hazard it could be really anything. Minor, to major, but minor and obviously taking a major very, very quickly. So, it's just basically letting everyone know that that's the culture you have got. Don't be afraid to talk up.*

> **Interviewee 3:** *[W]ithout trust the whole system falls apart.*

Interviewee 5: *I always look at any relationship. That trust is a really important attribute that I seek. And if there's a level of trust, in the coalface / workforce, that what we're trying to do is the right way of going about it.*

Many participants reflected on the value placed on collaborative teams, having confidence in the abilities of others and their leaders, and leader's willingness to get vulnerable and share stories with their teams to drive engagement, aligning with the ALI dimension of 'Self-Awareness':

Participant C1: *If we can organize ourselves, some blokes have certain times when you can get into certain areas. So, where if we're all working together, as we all know, we've got a job to do and we all need to get stuff done. It just helps in your awareness and, you know, work and safe as well.*

Participant C1: *I know working in construction, having young blokes, you always as an older bloke if you see a younger bloke maybe gonna to do something, stop him because I'd much rather hear that you stopped him and said, check what you're doing instead of walking past in hear that he cut himself with a saw later on. And you didn't say nothing then you'd feel terrible. So, experience becomes a lot to do you know how to minimise it.*

Interviewee 5: *I held a toolbox session at [site] where I spoke about my safety story. I would feel like we all have a story. We have something that shapes the person that you've become. You know mine was sort of shaped by dealing with a fatality when I was quite young in my career. So, I therefore saw the absolute worst thing that can happen, you know, when someone comes to work and then people having to, you know, tell their family that that person is never coming home again. And that sort of shaped my safety journey, and my story. And I try to share that story as much as possible because I think being open with your team and trying to explain why it's important, not just saying: it's important, because you can say a lot of things are important but it's about articulating why it's important. And I think that message has been*

quite strong and encouraged others to share their sort of stories, and I feel, so I guess that's how I try to lead.

Participant C4: *And it's a well-oiled machine. And, you know, they're on their game. They're not just, 'Here's the job. Let's get there by one o'clock. we bloody get it done and relax. That's what it's more about, just the jobs we're doing where there was a bigger piece here. We want to enjoy - with the safety talks we have, we then follow that with celebrating something and having a cake and those sorts of things. And there all little things. But it's you know, it's just adds to that's a well-oiled machine that looks very professional, I think. And it gets that buy-in for everyone else going, OK, this isn't just a regular site. This is this is something more.*

Interviewee 1: *I know that I have heard stories that provided examples and said things about what's happened in other workplaces. I think stories that are easier for people to stay tuned also. It's not just spitting out a whole bunch of facts and numbers. It's actual. This happened in real life. I think it just makes a situation easier to relate to.*

Interviewee 5: *I feel like sharing the stories and putting yourself in a vulnerable position, is not just a benefit from a health safety and a psychological safety or well-being area, although I think it will help all of those three things. I fundamentally believe it creates better operations. And if you look at our business now our performance is exponentially better than it was two years ago and not all that... I'm not attributing everything to that with the focus that we've got on lead safety indicators, or the safety sort of path that we've followed over these last two years. But I think a big part of it safety was the sort of ten peg that we staked into the ground two years ago and we said we needed to change, and it was the driver for change. And since then there's been a lot of other drivers for change, but that was that was the first thing that the first sort of tent peg that we stuck in the ground. And we've really, I think fundamentally, changed the operational performance and the financial performance of this business as a result.*

The analysis suggests several factors that participants described as an empowered and engaged team within the Company, which may contribute to safe operational outcomes.

5.3.4 Theme 3: Safe Operational Outcomes

The third theme from the thematic analysis focused on safe operational outcomes. This theme comprised of: workers identifying & responding to risks, the occurrence of incidents and injuries, organisational efficiencies & performance, the reporting of safety issues and incidents, workers' health & wellbeing, and workers' participation in safety activities. Participants discussed incidents and injuries, leading safety indicators and organisation impacts of good safety leadership.

Incidents and injuries were frequent foci in the Key Stakeholder Interviews as a key safety performance measure. Discussion from participants highlighted the impact of incidents and injuries from an individual and organisational perspective.

> **Interviewee 5:** *[S]afety really is quite simple. Every person who goes to work should be able to go home in that same condition at which they got there. So, you know that means not hitting your thumb with a hammer, not falling off a roof, you know not getting your hand caught in a pinch point. You know all that kind of thing. … But also, psychological safety or well-being I think is something that we started to have a bit more of a focus on, the well-being of our people. So, making sure that they're physically safe, but also psychologically safe as well. So, I think that's probably part of the next frontier that we need to push into a little bit more.*

> **Interviewee 2:** *So I think if I reflect previously when I first came into the contract, I thought safety leadership was poorly managed, you know, and it was... And that was basically from the leadership team on the contract down to our boots on the ground. I think over the last two years, we've invested a lot of time and energy around working out what our strategy is on the contract. And we developed five themes of improvement. And one of those themes were safety. And then safety had a number of initiatives that we've been driving on the contract from embedding Noggin, to making sure our leadership team are being visible out on onsite, really pushing the PPE process*

out to our subcontractors, doing safety audits. And we've seen a big improvement with our LTI frequency and MTI frequency rate dropped down dramatically.

Reflections were also provided by Focus Group C Participants in contradiction to the Company's zero harm goal in the following interaction:

Participant C2: *There is some risk in most, well, a lot of it is just negotiate around it to try to minimize it as best you can.*

Participant C4: *[W]hen you look at zero harm and you know you have KPI's around having injuries or you want zero harm. I think that's an ideal world and you and you preach that, and everyone tries to support that. But things happen. And I think when you ask a question about risk, is avoidable or is it...Is risk part of everything?*

Participant C4: *I think, you know, in a perfect world… I think we can manage risk properly and try and eliminate [it] nearly fully. But again, there's real world where you just have to manage the risk.*

Participant C1: *It comes down to 'accidents' at the end of the day. Most of the time it would be an accident. It wouldn't be somebody taking a risk. If you're going to write zero harm on tops and shirts, you have to own it at the end of the day.*

Participant C4: *Agreed. Yeah. I'm not saying we don't support it. I'm saying it's a great way to push. But again, there are risks.*

Interviewees further explored the financial and personal costs and organisational inefficiencies associated with incidents and injuries occurring in the workplace:

Interviewee 4: *[P]eople think that safety costs money. But I know that from previous employers. They think that it's costing you money. But in the end of*

the day, it actually saves your money, as we will know, because when someone gets injured in the role, it affects huge for the families all the way through the employee. And I know that firsthand.

Interviewee 5: *Well the facts are, an LTI cost the business approximately fifty thousand dollars. When you look at all the time invested. There is an expense to having an injury. If we have an incident you know then then I'm sending Tim out to do investigations, and business kind of stops for a couple of days and we focus on the investigation, and we try to understand why that happened? How can we learn from that? How do we stop it from happening again? So that there is a significant contract disruption when an incident occurs. And that's just an incident. It might be a high potential near miss, like we had at the [site] the other day. But when an actual incident happened, you know there's a lot of, there's a lot of cogs that start turning to deal with that. And if there is there can be significant impact to the business both in operational performance and financial performance.*

Interviewee 1: *LTIs cost the business a lot of money. Even workers comp and all of that. Any injury is going to cost the company money? So, it's gonna be sick leave, it's gonna be workers comp, whatever the situation may be, it will cost you money. So, a safe work force is actually more cost effective than people who are continually getting injured. It does definitely impact client perception because if they can see that we're doing things well and we're doing it safely, they're going to want to up their game. People always remember the bad things before they mentioned the good. So, if they say that all these guys are always, you know, jaywalking or they're always doing this. That's always gonna be in their mind that that's what our company is known for. As bad as it sounds, they everyone remembers the bad before they remember the good.*

Workplace incidents and injuries may also have a reputational impact on the Company and impact customer/client perceptions and future business opportunities:

Interviewee 3: *Yes, we have to be safe. But in the context, you have to be safe and get the job done. Cause if you don't get the job done, you don't have*

a contract. And harshly safety becomes irrelevant because you're not there to be safe.

Interviewee 3: *[T]he customer isn't [just] satisfied with safety. That is the prerequisite. They're dissatisfied if there's an issue regarding safety.*

Interviewee 2: *I think industries are very focused on safety. If I look at [Client], whenever they look at a contractor, the first thing they think about is safety. I think if you can demonstrate a good safety culture and a good, and you're providing good safety, I guess statistics or performance out in the field... although there's a commercial aspect in each contract, the other 50 percent is a safety focus. So, every industry…as a client, you know, there's a reputational risk for them if we don't get safety right on the ground. So they're very focused on safety.*

Interviewee 5: *[I]f your data is poor, if you know your, TRIFR is poor, LTIFR is poor, it makes it really hard to secure new contracts. Because with every contract that you try to secure moving into the future as growing the business. A lot of our contracts are government contracts and they're quite heavily related to safety performance. So, having good data is important to help grow the business.*

Focus Group participants and Key Informant interviewees expressed a shift from incident reporting as defining safe operational performance towards leading indicators of safety conversations, worksite audits and seeing the increased engagement of workers participating or undertaking these safety activities across the Company:

Interviewee 5: *[P]articularly over the last two years we've tried to have a strong focus on lead safety indicators. Fundamental belief that if you are engaging in talking about the safety that you will prevent incidents from occurring. So yeah, we've had a strong press over the last two years on lead safety indicators and we do that through our Noggin system, primarily by*

conducting safety conversations which we document, but also through worksite audits and quality audits as well.

Interviewee 4: *We had our own obviously KPI even from back in [previous manager's] days to [current manager's] days. But that's also that was from my upper management. But I've had my own, where I'll go one step higher, which is three hazards per week. And it's always been in our weekly report. And to go with those obviously safety conversations and audits. So that's why our numbers are higher, because I've made sure we've always tried to keep to that we have successfully.*

Participant C4: *It's great to have these targets for safety conversations. And even within the trade group, there's some that actively want to get as many done as they do. And there are always ongoing having safety conversations, reporting hazards. And then there's others that are going ok this a target KPI that I need to meet. So, I need to do it. And that's the difference.*

Interviewee 5: *I guess you can look at the data and the data probably tells you that story pretty well. You know you, we conduct a lot more safety conversations than the rest of our business. So, I think the VIC / TAS business does between 50 and 60 per cent of all of PFM's safety conversations. And so that's something that we're proud of. It means that all our people are engaging in safety. It's not so much about volume per se. I guess the other metric that we like to try and measure is we call it contributors. So, it's the number of contributors to safety conversations, and we think that's just as important as the total number of safety conversations because that means we've got more people that are out and about talking about safety. We also have the fundamental belief that not every safety conversation gets logged. So, we're confident that there's more happening out there than what actually gets logged, but the fact that we are logging such a high number of conversations, I think is a strong indicator, as a safety sort of measure of the business.*

Interviewee 5 expanded the safe operational performance of the Company with an observation on the health and wellbeing of workers and the further work that

is required to continue to support the whole person when it comes to providing a safe and healthy workplace:

> **Interviewee 5:** *I fundamentally don't believe that people ask for help enough. So, it's about getting people to recognise when they might need help. So hopefully look at getting some support is almost being like preventative maintenance rather than waiting for something to break and then having to go into a fix. You know and out and now we have to break it down into that terminology which everybody understands. But, I fundamentally believe the use of our employee assistance program is really underutilised, and it's a great service, and I still don't feel like the business really understands all the services that might be available to them.*

> **Interviewee 5:** *[W]hen you ask the question is someone fit for work, generally it's always been thought of well that person has a sore ankle you know, so they probably shouldn't be on their feet all day doing whatever activity it is that they need. And we probably never really thought too much about, well, look that person has, you know, had a significant challenge in their, in their relationship, or there's been an issue with a family member, or something along those lines. And fundamentally you know those types of impairments can be more challenging than someone that might be hungover or someone that didn't get enough sleep last night because their minds not on the job. So, I guess we're starting to understand that you know the appreciation and, you know, the correlation of people that are mentally healthy as well as being as being fit for work from that process. So psychological, so I think we're only scratching the surface to be honest and where we need to be. I feel like we've come a long way in the last 12 months, but I feel like we've got a long, a lot further to come.*

This focus on health and wellbeing was reiterated by Interviewee 2 as the next element for the Company to press into moving forward:

> **Interviewee 2:** *We do safety well. I think we, we invest a lot of energy in time and safety. I think we're at the top of the hill now where I sort of think what's next when it comes to safety? I mean, I'd like to move down to a mentally*

healthy workplace, and [the Company] as a business, invest energy into that. I think we have a lot of processes and systems in place to get it right. And I think culturally in some contracts and not all where we're doing safety well. But for me, it's about it's that people element next. So how can we support our people more around their personal wellbeing on the contract? And I think it'd be good for [the Company] as a business to invest energy into that.

The analysis suggests that authentically leading safety and empowered and engaged teams lead to a broad range of safe operational outcomes in the Company.

5.4 SUMMARY OF FINDINGS

The focus of the study is to explore the relationship between authentic leadership and safety performance within the context of the Company. The section of the chapter discusses the findings of the qualitative data as it relates to the project interventions and the perceived impact of these interventions on the Company's safety performance.

5.4.1 Project Interventions

Leadership Intervention

The Leadership Intervention was delivered to the operational contract leaders in a standing monthly Contact Manager's meeting, and a follow-up session provided to a new contract that was mobilised following the initial session being held. In total, 30 leaders participated in the Leadership Intervention. Interview participants provided a mixed reflection on the effectiveness of the leadership intervention and the retention of information shared during the workshop – from not remembering many details of the session to highlighting the level of engagement and vulnerability shared in the session:

Interviewee 1: *I honestly can't remember. The only thing I remember is you showed a TED talk. Yeah, I remember that one. I know there was a workbook.*

Interviewee 4: *I remember it [a] bit. It was definitely a good workshop and very informative. You did a great talk on safety at the time. All these meetings, especially even the recent one to do with the new contract. There's*

a lot of emphasis on safety, which is very good. It's not just brushed away. It's obviously pushed in us as a culture. Which I do like.

Interviewee 2: *I think the workshop that we had. I mean, you walk away from any workshop with another bit of information to process. And I think yeah, I think my, my shifting probably has changed a little bit around that workshop. And I think the workshop helped me put together our strategy for next twelve months as well. So, I learned from that workshop about, yeah, authenticity that I can bring into this contract.*

Interviewee 5: *Probably the main thing that stuck out for me, if we tried to run that workshop two years ago, it wouldn't have been very well received… And I think probably the thing that did surprise me a little bit was is the was people's openness and willingness through those sessions. Because I fundamentally believe that 12 months earlier, that we would not have had the same reception. No one put any opposition to it. And everyone thought it was a good idea. And everybody contributed. Even you know, some people that you probably thought might find it a little sort of confronting or a little bit too left of their normal right personality. You know I'll use the term touchy feely, a fluffy kind of thing. I think... I think that they were ready for it because we'd spent 12 months prior to it, basically mandating that everyone's safety was of paramount importance to us. And they realised that you know, if that wasn't top of mind for them previously, it needed to become top of mind. So probably the thing that surprised me a little bit was people's openness and willing to contribute.*

Interview participants shared examples of how Authentic Leadership had been demonstrated within their workgroups following the Leadership Intervention:

Interviewee 1: *I definitely think the operations team and [Manager] are very authentic… I just find they really people focused. So, they'll ask if they're teams, what's wrong. And they'll always try and say, well, something from their perspective. And then they'll say, look, you know, I understand that this is the way we need to go about it. And I think they don't just say, no, you have*

to do this. You have to do that. It's very it's sort of a genuine type conversation, I feel, when they're speaking to a lot of the staff. It's different. I guess, you know, the demeanour is quite calm and, you know, they've got that empathy so good.

Interviewee 2: *I'm a true believer that if somebody comes to me with a safety issue or concern, we action that immediately goes. I want to demonstrate to the contract that we are listening. We are listening to our workforce. The contract leadership team put together our safety commitments... Twelve months ago, and we're still driving that every day and they're on our Safety Noticeboard. I like our safety data up today as well, so I'm really big with Richard to make sure that all the information that comes through is always up to date, so people can see that we are focused on safety. So, it's really for me, it's about being visible, being out there and being amongst what's happening on the ground.*

Interviewee 2: *I do definitely believe it's boots on the ground but is building relationships. It's actually having an understanding how people operate on the ground. Everyone's different. Everyone has a purpose. If people get things wrong, that's okay. That we learn by that. I'm not one that... For on this contract, we do something wrong, we get it better. I fundamentally don't believe abating people gets the right outcome. It is about working with someone to improve their processes, getting the best outcome next time. So, I don't believe any fault is an individual unless it's plainly clear that the individuals done something dramatically wrong. But I definitely believe that most of our safety issues that contribute to process breakdown and then we always go back to the process and understand where did we get it wrong.*

Interviewee 5: *I don't think personally I've changed. What I do have is, I have more confidence in, if there's anything that we wanted to do, we'd have no push-back. And that's probably more of a function of the team around me have grown and developed in this area. So, you know, within reason I feel like from a HSE perspective we could just we could literally go out and do anything right now and we'd have the full support, which is a very powerful position.*

Interviewee 5: *It's the not just telling you what to do, but we're telling you why. And why what's important to us. And hopefully it'll resonate with them as well… Yeah, I think it's really important. And yeah, it helps people relate just in general. You know because as you get to know somebody in a more personal, and a deeper level, you know, the relationship grows stronger as well. So, your ability to work closely with that person, your ability to be able to perform together increases. So, I mean, it's not to be honest, it's not just the safety benefit, it's a benefit in delivering better operations. Because by working together more closely, by understanding who that person is and what makes them tick, they naturally work better, and they deliver it more productive, and they deliver a better service. And so, I feel like sharing the stories and putting yourself in a vulnerable position, is not just a benefit from a health safety and a psychological safety or well-being area, although I think it will help all of those three things. I fundamentally believe it creates better operations. And if you look at our business now our performance is exponentially better than it was two years ago and not all that... I'm not attributing everything to that with the focus that we've got on lead safety indicators, or the safety sort of path that we've followed over these last two years. But I think a big part of it safety was the sort of tent peg that we staked into the ground two years ago and we said we needed to change, and it was the driver for change. And since then there's been a lot of other drivers for change, but that was that was the first thing that the first sort of tent peg that we stuck in the ground. And we've really, I think fundamentally, changed the operational performance and the financial performance of this business as a result.*

After-Action Reviews

The After-Action Review Intervention involved establishing an After-Action Review (AAR) process for implementation within the Company. The After-Action Review Intervention aimed to improve safety performance and learning within the workgroups. Interview participants spoke of formal and informal after-action review processes they have implemented within their workgroup post-incident or to gain learnings following the completion of a task:

Interviewee 2: *An example was a third-party fatality on the Ring Road. So, I actually wanted to review our processes to understand what actually happened out on site. Although it wasn't related to us, I want to learn from that. So, we brought that back into the contract. And we've learned from that and put a number of things in place. Good stories of crews doing the right thing out in the field. I think we demonstrate that we, I guess, we don't formally sit down and fill out a spreadsheet, but we talk around the table at leadership team around what potentially occurred out on site and how can we learn from that. So good stories could be, the new permit to work system that we're actually going to introduce shortly where each work site will have a board set up. So, when somebody goes to the site, they can actually look at the board and make sure the checks and balances are in place. Now that come from an opportunity to improve a system out on site. But it was a learning that we took away from an inspection that we brought back into Brooklyn to say, well, how can we make it easy for our crews? So that's probably an example of a good news story.*

Interviewee 3: *Oh, in honesty, only if something goes wrong and there's a huge chance for improvement. And yes, we do sometimes in that context. Yeah. Is it captured? Occasionally on a on a tool box meeting, but not captured as a formal document.*

Interviewee 4: *Informally we do it all the time. See this is a complex site, so don't waste time, time to go through it. But we've always talking about it. So yeah, I've always encouraged the guys. Have a think about how the job went and how we could have done it better… As an example at the moment we're doing furniture removing the old display suite and making a new one. And me and [colleague] were here by ourselves yesterday. So, we started using the [Company] ute and found that was just taking too long and was a bit unsafe, was lifting them up higher. So, it was a matter of rethinking it and using a tractor with a trailer with a lower base and getting more stuff on. So obviously a bit more time effective. So, we found out pretty quickly a better way of doing it. And you implemented that straight away.*

Learning Team

The Learning Team Intervention aimed to explore selected areas of operational concern within the Company and identify opportunities to improve the effectiveness or performance in this area. Two Learning Teams were conducted focusing on Health and Wellbeing and Contract Mobilisation. Interviewee 5 spoke of the Company's need to focus more attention on health and wellbeing to support its workers, expanding on the Health and Wellbeing Learning Team facilitated within the 'Delta' workgroup:

> **Interviewee 5:** *When you ask the question is someone fit for work, generally it's always been thought of well that person has a sore ankle you know, so they probably shouldn't be on their feet all day doing whatever activity it is that they need. And we probably never really thought too much about, well, look that person has, you know, had a significant challenge in their, in their relationship, or there's been an issue with a family member, or something along those lines. And fundamentally you know those types of impairments can be more challenging than someone that might be hungover or someone that didn't get enough sleep last night because their minds not on the job. So, I guess we're starting to understand that you know the appreciation and, you know, the correlation of people that are mentally healthy as well as being as being fit for work from that process. So psychological, so I think we're only scratching the surface to be honest and where we need to be. I feel like we've come a long way in the last 12 months, but I feel like we've got a long, a lot further to come… I fundamentally don't believe that people ask for help enough. So, it's about getting people to recognise when they might need help. So hopefully look at getting some support is almost being like preventative maintenance rather than waiting for something to break and then having to go into a fix. You know and out and now we have to break it down into that terminology which everybody understands. But, I fundamentally believe the use of our employee assistance program is really underutilised, and it's a great service, and I still don't feel like the business really understands all the services that might be available to them. And I think that's probably the next phase in, it's almost like your emotional coaching in a way. You know where we become a little bit more emotionally mature. As a business, as an executive, and right down to you know trades who work on the ground. And*

then at that point there, I mean that's the sort of ticking off physical safety, psychological safety, systems processes, you know you've got to really high performing team at that point.

5.4.2 Intervention Impact on Safety Performance

Interview participants considered worker participation, through Safety Conversations being recorded, the number of Safety Conversation Contributors, and completing Worksite Reviews, as having an impact on the safety performance of the Company through worker engagement, learning and improvement:

> **Interviewee 2:** *[S]afety had a number of initiatives that we've been driving on the contract from embedding Noggin, to making sure our leadership team are being visible out on onsite, really pushing the PPE process out to our subcontractors, doing safety audits. And we've seen a big improvement with our LTI frequency and MTI frequency rate dropped down dramatically. But it's really for me it was about boots on the ground and being visible out onsite.*

> **Participant C4:** *It's great to have these targets for safety conversations. And even within the trade group, there's some that actively want to get as many done as they do. And [they] are always…having safety conversations, reporting hazards.*

> **Interviewee 5:** *[P]articularly over the last two years we've tried to have a strong focus on lead safety indicators. [We have a] [f]undamental belief that if you are engaging in talking about the safety that you will prevent incidents from occurring. So yeah, we've had a strong press over the last two years on lead safety indicators and we do that through our Noggin system, primarily by conducting safety conversations which we document, but also through worksite audits and quality audits as well.*

> **Interviewee 2:** *[W]e track on the number of safety conversations, we track the number of audits that we've done across the business. And we're also a contract across VIC and TAS that are learning of each other. And I think that's important. I think the good things at [another site] are doing [we] bring into this contract and the things that we're doing on this contract we take into*

contracts in Tasmania. So, I think we're, a we're a learning team. And I think we transfer the skills across nicely.

Interview participants noted a perceived improvement in performance within their workgroup and across the Company:

> **Interviewee 2:** [*W]e've seen a big improvement with our LTI frequency and MTI frequency rate dropped down dramatically.*

> **Interviewee 4:** *I've had my own [KPIs], where I'll go one step higher [than expected], which is three hazards per week. And it's always been in our weekly report. And to go with those obviously safety conversations and audits. So that's why our numbers are higher, because I've made sure we've always tried to keep to that we have successfully.*

> **Interviewee 5:** *[T]he VIC / TAS business does between 50 and 60 per cent of all of [entire Company's] safety conversations. And so that's something that we're proud of. It means that all our people are engaging in safety. It's not so much about volume per se. I guess the other metric that we like to try and measure is we call it contributors. So, it's the number of contributors to safety conversations, and we think that's just as important as the total number of safety conversations because that means we've got more people that are out and about talking about safety.*

5.5 DISCUSSION ON THE QUALITATIVE FINDINGS

The thematic analysis of the Focus Groups and Key Informant Interviews identified three distinct themes reflecting the participants' perceptions as they related to the study: that 'Authentically Leading Safety' led to 'Empowered & Engaged Teams' and 'Safe Operational Outcomes' for the Company.

The four dimensions of Authentic Leadership, being: self-awareness, unbiased processing, internalised moral perspective, and relational transparency (Ilies et al. 2005), emerged through the qualitative data analysis. 'Relational Transparency' and 'Internalised Moral Perspective' was highlighted through the importance of leaders building relationships with their workers, and the perceived care and empathy demonstrated by leaders, congruent with the Company's core values of 'care &

empathy' and 'personal safety leadership' (Liu et al. 2018). The ALI dimension of 'Balanced Processing' emerged in the data through how leaders responded to issues, specifically their openness to creating an environment of learning and improvement (Ilies et al. 2005), rather than blaming workers for when things go wrong. 'Self-Awareness' become apparent in the thematic analysis as participants reflected on the value placed on collaborative teams, having confidence in the abilities of others and their leaders, and leader's willingness to get vulnerable and share stories with their teams to drive engagement.

A strong sense of trust and respect was identified by participants contributing to them feeling like empowered and engaged team members, aligning with the literature on authentic leadership behaviour being associated with a follower's trust in the leader and that "trust is fundamental for the effectiveness of leadership… and [authentic leadership] builds trust" (Agote et al. 2016, p. 50), and that trust is a foundational requirement for leaders to progress HSWB outcomes in the workplace (EY 2016). These findings support the view that authentic leaders build trust, engagement and workplace wellbeing (Luthans et al. 2006).

Agote, Aramburu and Lines (2016) found that authentic leadership behaviour is associated with a follower's trust in their leader. They concluded that In a recent Ernst & Young paper on the future of HSWB, Trust is an essential aspect of effective working relationships, contributing to organisational, group and individual productivity (Brower, Lester, Korsgaard & Dineen 2009).

5.6 CONCLUSION

This chapter described how the qualitative data was prepared and analysed to partially address the study's research questions. The audio files from the Focus Groups and Key Stakeholder Interviews were transcribed verbatim using Sonix.ai before undertaking a Thematic Analysis with the assistance of ATLAS.ti. The demographic characteristics of the respondents were reported as descriptive statistics. Three distinct themes emerged from the Thematic Analysis, reflecting the participants' perceptions of the study: 'Authentically Leading Safety', 'Empowered &

Engaged Teams', and 'Safe Operational Outcomes'. Qualitative data was presented on the Project Interventions and their impact on Safety Performance.

The next chapter presents the study's conclusions, including research findings, the significance and contributions of the study, suggestions for future research, and reflections from the Practitioner-Researcher.

CHAPTER 6 CONCLUSIONS

6.1 INTRODUCTION

This study was designed to explain the nature of the possible relationship between Safety Leadership, through a lens of Authentic Leadership, and Safety Performance in the context of an Australian Facility Management Company. The Company is underpinned by two core values of 'personal safety leadership' and 'care & empathy', however, there is no measure of safety leadership prioritisation or the impact within the workforce, and there is no understanding of the Company's need to improve safety performance.

The previous chapter described how the qualitative data was prepared and analysed to partially address the study's research questions and builds on the quantitative data analysed in Chapter 4. This chapter reports the findings that have emerged throughout the research and explores the conclusions reached in answering the research questions. This chapter interprets the results presented in Chapters 4 and 5 to consider the alignment and contrasts to extant literature. The structure of this chapter is shown in Table 6.1.

Table 6.1 Structure of Chapter 6

Section	Content	
6.1	Introduction	
6.2	Study Outcomes	Research Outcomes Project Outcomes
6.3	Research Findings	Research Questions Study Propositions
6.4	Study Significance	
6.5	Study Contributions	Contributions to the Knowledge of Professional Practice Contributions to the Knowledge of Theory Contributions to the Practitioner Summary of Contributions
6.6	Study Limitations	
6.7	Suggestions for Future Research	
6.8	Practitioner-Researcher Reflections	
6.9	Conclusions	

6.2 STUDY OUTCOMES

The purpose of this work-based study was to implement a project and conduct research that investigated a case indicative of the research problem: where there is no measure of safety leadership prioritisation in relation to its stated commitment to increased safety prioritisation impact within the workforce and no understanding of the Company's needs.

Section 3.4.1 defined the Company as a case and provided a holistic, evidence-based explanation of the organisational context where safety is prioritised but the interaction between safety leadership, safety climate, and safety performance measures are unknown.

Chapter 2 comprehensively reviewed the extant literature and knowledge related to safety in facility management contexts, overarching theories, and research reporting on similar phenomena and concept models.

Chapter 3 described the methodology to investigate the nature of the relationship, if any, between Authentic Leadership, Safety Climate and Safety Performance within the context of a facility management company as a case study. The quantitative and qualitative results are presented in Chapters 4 and 5, respectively.

Section 3.4.4 described the HSWB project interventions undertaken as part of the case study protocols within the Company. Chapter 5 reported an indicative evidence base for the intervening effect of these interventions. Section 6.2.2 describes the outcomes of the project intervention.

The quantitative and qualitative findings presented in Chapters 4 and 5, respectively, provide the research with an evidence-based insight as to the dynamics of leadership prioritisation of safety within the Company. The significance and contribution of these evidence-based insights are discussed in this Chapter.

Section 1.5 outlined the anticipated contributions for the work-based learning pedagogical outcomes of measurable contributions to practice (the Company), practitioners, disciplinary knowledgebase, and the personal and professional development of the practitioner-researcher, which will be discussed in Section 6.8.

6.2.1 Research Outcomes

While studies on safety leadership interventions are not new, a need remains for further studies on specific safety leadership approaches and the impact on safety compliance and safety participation at work (Mullen et al. 2017). The purpose of this work-based study was to implement a project and conduct research that investigates a case indicative of the research problem: where there is no measure of safety leadership prioritisation or the impact within the workforce, and there is no understanding of the Company's need to improve safety performance.

The research adopted an explanatory mixed-method study to understand the Safety Leadership, through the lens of Authentic Leadership, Safety Climate and Safety Performance of an Australian Facility Management Company, within a Type 2 embedded single-case study design (Yin 2009). The case study design allowed for the units of analysis to be clearly articulated within the Company, the phases of the study to be defined, including the function of the project interventions.

The study validated two separate survey instruments, the ALI (Neider & Schriesheim 2011) and NOSACQ-50 (Kines et al. 2011), in the context of a leading Australian Facility Management Company, testing these instruments in novel settings, demonstrating the applicability of these tools to the context of the facility management sector in Australia. The ALI instrument confirmed excellent internal consistency and overall reliability for both the Pre- and Post-Intervention surveys (α = 0.960 and 0.962, respectively). The NOSACQ-50 instrument also identified excellent internal consistency and overall reliability (α = 0.968 and 0.969 for the Pre- and Post-Intervention surveys, respectively). The multivariate analysis of these instruments and the Company's safety performance measures, together with a thematic analysis of focus group and key informant interviews, were used to answer the study's explanatory research questions.

6.2.2 Project Outcomes

The researcher undertook a work-based project as a set of practitioner-based, non-experimental activities to support the Company in delivering safe operational outcomes within the business. The work-based project ran concurrently with the research stream for approximately 12 months and focused on safety performance

initiatives that would benefit the operational workgroups of the Company. These work-based project activities were based on the researcher's insider insights into the Company (Teusner 2016), the research focus of the study, and in consultation with the researcher's manager and operational executive sponsor.

The Leadership, After-Action Review and Learning Team Interventions, described in the Section 3.4.4 described, were implemented in consultation with the researcher's manager and operational executive sponsor and aimed to:

1. Support the safety leadership capabilities of the leaders across the region's workgroups through a safety leadership workshop.
2. Improve safety performance and learning through the introduction of after-action reviews.
3. Conduct a series of learning teams to close the gap between work-as-imagined and work-as-done.

Leadership Intervention

The Leadership Intervention involved developing and delivering a safety leadership workshop for the leaders of the Company's workgroups. The focus on safety leadership was linked to the current study's literature review, the Company's core values of 'personal safety leadership' and 'care & empathy', and the researcher's observations of a broad range of safety leadership approaches being demonstrated across the region.

The Leadership Intervention was delivered to the operational contract leaders in a standing monthly Contact Manager's meeting, and a follow-up session provided to a new contract that was mobilised following the initial session being held. Thirty leaders from across the Company's Victorian/Tasmanian operational workgroups participated in the Leadership Intervention.

After-Action Reviews

The After-Action Review Intervention was introduced to workgroup leaders during the Leadership Intervention. The After-Action Review Intervention aimed to improve safety performance and learning within the workgroups. The researcher engaged with all workgroup leaders to guide completing the AAR, which was

reiterated in subsequent monthly Contact Manager's meetings. The researcher arranged to facilitate several AARs within three workgroups across the region.

Nineteen completed AARs were shared with the researcher during the intervention period. AAR reviews provided operational and safety improvement learnings, ranging from suggestions to job planning and scheduling, weather considerations, and increased frequency of preventative checks on equipment.

A selection of these completed AAR Worksheets is available in Appendix G.

Learning Team

The Learning Team Intervention aimed to explore selected areas of operational concern within the Company and identify opportunities to improve the effectiveness or performance in this area. Two Learning Teams were conducted with workgroups 'Delta' and 'Lima', focusing on Health and Wellbeing and Contract Mobilisation, respectively.

A report of each Learning Team was provided to the operational executive sponsor to share the learnings from the intervention and identify improvement opportunities. Activities implemented as a result of these Learning Teams included:

- Health and Wellbeing Learning Team
    - Regular health and wellbeing updates were distributed to employees, focusing on topical information such as Heart Health, Women's Health, etc.
    - Re-engaged the workforce in Red25 Blood Donation promotions.
    - Engaged with HR / EAP to ensure employee understanding of access to this vital resource to promote the program and increase access to staff and families.
    - Promoted regional physical activity opportunities, such as Tough Mudder / Spartan Races.
- Contract Mobilisation Learning Team
    - Dedicated mobilisation manager appointment and standard mobilisation/transition plan developed.

- Developed a health, safety, environment and quality (HSEQ) implementation guide to standardise the HSEQ requirements for new contract mobilisations across the Company, ensuring that the Company's management system requirements are fully implemented, maintaining compliance with the certified system.
- An up-to-date listing of key contacts for the mobilisation and new contract team was developed for each functional area.
- Subcontractors and suppliers are onboarded earlier in the mobilisation process, not from the 'go live' date, ensuring better alignment of subcontractors with the Company's HSEQ requirements.

6.3 RESEARCH FINDINGS

6.3.1 Research Questions

Research Question 1

RQ 1: What is the relationship between Authentic Leadership, Safety Climate and Safety Performance within an Australian Facility Management Company?

Research question one aims to explain the nature of the possible relationship between Safety Leadership, through a lens of Authentic Leadership, and Safety Performance within the Australian Facility Management Company workplace. Six sub-questions were defined to assist in answering the research question, with the quantitative analysis of the ALI and NOSACQ-50 instruments and the Company's safety performance metrics used as the basis for responding to these questions.

RQ 1a) How does Authentic Leadership interact with Safety Climate within an Australian Facility Management Company?

The relationship between Authentic Leadership and Safety Climate was assessed through bivariate correlational analysis. Correlational analysis on the ALI and NOSACQ-50 instruments identified high levels of statistically significant correlations within and between all instrument factors at the 0.01 level. These statistically significant correlations were consistently observed in both the Pre- and Post-Intervention datasets (see Table 4.12 and Table 4.24, respectively).

This finding demonstrates an alignment with, and draws a linkage between, the two core values of the Company: 'care & empathy' and 'personal safety leadership', and suggests a relationship between Authentic Leadership and Safety Climate exists where leaders actively demonstrate a commitment to safety and a genuine care and passion for the well-being of the employees and the organisation through systems and structures that incorporate practical safety in day-to-day operations (O'Neill et al. 2015; Liu, Y. et al. 2018).

RQ 1b) How does Authentic Leadership relate to Safety Performance within an Australian Facility Management Company?

Bivariate correlational analysis was undertaken on the Pre-Intervention and Post-Intervention Data Collection points (see Table 4.12 and Table 4.24, respectively). The correlational analysis included the workgroup's safety performance metrics and the mean ALI scores to explore the relationship between Authentic Leadership and Safety Performance. While significant cross-correlations were observed within the Safety Compliance and Safety Participation metrics, no statistically significant correlations were observed between the mean ALI scores of the workgroups and the safety performance metrics.

Negative binomial regression of the safety performance metrics concluded that the mean ALI scores of workgroups had a statistically significant effect across several performance metrics. The mean ALI was a significant predictor of the number of contributors to hazard reporting and safety conversations, the number of safety conversations reported, and the total number of injuries reported within the workgroups.

- Hazard Contributors (Par_HAZC): the mean ALI score was a statistically significant predictor [Exp(B)=3.285] of the number of hazard contributors between the Pre- and Post-Intervention datasets (B=1.189, S.E.=.5829, p=.041), suggesting that for each one-unit increase in the mean ALI score, the expected log count of the number of people contributing to hazard reporting increases by a factor of 1.198.

- Safety Conversations Reported (Par_SC): the mean ALI score was a statistically significant predictor [Exp(B)=9.094] of the number of safety conversations reported between the Pre- and Post-Intervention datasets (B=2.208, S.E.=.8520, p=.010), suggesting that for each one-unit increase in the mean ALI score, the expected log count of the number of safety conversations reported increases by a factor of 2.208.
- Safety Conversation Contributors (Par_SCC): the mean ALI score was a statistically significant predictor [Exp(B)=2.968] of the number of safety conversation contributors between the Pre- and Post-Intervention datasets (B=1.088, S.E.=.4982, p=.029), suggesting that for each one-unit increase in the mean ALI score, the expected log count of the number of people contributing to Safety Conversations reported increases by a factor of 1.088.
- All Injuries Reported (Inj_All): the mean ALI score was a statistically significant predictor [Exp(B)=6.115] of the number of All Injuries reported between the Pre- and Post-Intervention datasets (B=1.811, S.E.=.7951, p=.023), suggesting that for each one-unit increase in the mean ALI score, the expected log count of the number of all injuries recorded increases by a factor of 1.811.

No statistically significant correlational relationships between the mean ALI scores and the workgroup's safety performance metrics were observed in the analysis of the relationship between Authentic Leadership and Safety Performance. However, the negative binomial regression analysis did demonstrate a statistically significant predictor effect observed between the Authentic Leadership scores and several safety performance metrics. The finding is supported by previous research and literature that suggests safety leadership, and more specifically, Authentic Leadership improves safety performance (Wu, T.-C. et al. 2008; Lekka & Healey 2012; Cavazotte et al. ; Nielsen, Eid, Mearns & Larsson 2013).

RQ 1c) How does Safety Climate relate to Safety Performance within an Australian Facility Management Company?

Bivariate correlational analysis was undertaken on the Pre-Intervention and Post-Intervention Data Collection points (see Table 4.12 and Table 4.24, respectively). The correlational analysis included the workgroup's safety performance metrics and the mean NOSACQ-50 scores to explore the relationship between Safety Climate and Safety Performance. While significant cross-correlations were observed within the Safety Compliance and Safety Participation metrics, no statistically significant correlations were observed between the mean NOSACQ-50 scores of the workgroups and the safety performance metrics.

Negative binomial regression of the safety performance metrics concluded that the mean NOSACQ-50 scores of workgroups had a statistically significant effect across several performance metrics. The mean NOSACQ-50 was a significant predictor of the number of contributors to the number of incidents reported, the number of safety conversations recorded, and the total number of injuries reported within the workgroups.

- Incidents Reported (Com_Inc): the mean NOSACQ score was a statistically significant predictor [Exp(B)=.029] of the number of incidents reported between the Pre- and Post-Intervention datasets (B=-3.643, S.E.=1.6715, p=.029), suggesting that for each one-unit increase in the mean NOSACQ-50 score, the expected log count of the number of incidents reported decreases by a factor of 3.643.
- Safety Conversations Reported (Par_SC): the mean NOSACQ-50 score was a statistically significant predictor [Exp(B)=.012] of the number of safety conversations reported between the Pre- and Post-Intervention datasets (B=-4.439, S.E.=1.7784, p=.013), suggesting that for each one-unit increase in the mean NOSACQ-50 score, the expected log count of the number of Safety Conversations recorded decreases by a factor of 4.439.
- All Injuries Reported (Inj_All): the mean NOSACQ score was a statistically significant predictor [Exp(B)=.002] of the number of All Injuries reported

between the Pre- and Post-Intervention datasets (B=-5.993, S.E.=1.7418, p=.001), suggesting that for each one-unit increase in the mean NOSACQ-50 score, the expected log count of the number of all injuries recorded decreases by a factor of 5.993.

No statistically significant correlational relationships between the mean NOSACQ-50 scores and the workgroup's safety performance metrics were observed in the analysis of the relationship between Safety Climate and Safety Performance. However, the negative binomial regression analysis did demonstrate a statistically significant predictor effect observed between the Safety Climate scores and several safety performance metrics. The finding is supported by previous research and literature that suggests linkages between safety climate and safety performance within an organisational setting (Zohar 1980; Clarke 2006; Zhou et al. 2008; Stemn et al. 2019).

RQ 1d) What are the Trades-based and Office workers' perceptions of Authentic Leadership within an Australian Facility Management Company?

The mean Pre-Intervention scores for the four ALI dimensions ranged from 3.73 to 3.94, and the mean Post-Intervention scores ranged from 3.85 to 4.07, out of a maximum score of 5.00. The importance of authentic leadership was described in the qualitative data, with participants noting:

> **Interviewee 1:** *I think you need to be authentic with all things to do... for me, I don't believe someone if they're not being authentic or if I think I've got ulterior motives. So yeah, I do think it has an important part to play.*

> **Participant C3:** *I think they really, truly have to believe in it...then it really does flow down.*

Analysis of variance (ANOVA) was conducted to compare the effect of respondent demographic profiles on the mean ALI score in both the Pre- and Post-Intervention data sets (refer Table 4.5 and Table 4.17, respectively).

The effect of *Role Type* on the Pre-Intervention mean ALI score was statistically significant, [F (1,153) = 4.615, p=.033], indicating that the mean ALI score of those

respondents in Salaried/Administrative roles (M=4.034; SD=0.785) is statistically higher than that of Trades/Labour roles (M=3.705; SD=0.973).

The effect of *Role Type* on the Post-Intervention mean ALI score was statistically significant, [F (1,155) = 7.107, p=.009], indicating that the mean ALI score of those respondents in Salaried/Administrative roles (M=4.058; SD=0.786) is statistically higher than that of Trades/Labour roles (M=3.661; SD=1.011).

The effect of *People Leader* on the mean ALI score was also statistically significant, [F (1,155) = 3.991, p=.048], indicating that the mean ALI score of those respondents identifying as People Leaders (M=4.087; SD=0.732) is statistically higher than those not identifying as People Leaders (M=3.804; SD=0.971).

This finding that Office Workers in both the Pre- and Post-Intervention dataset, and People Leaders in the Post-Intervention dataset perceive their leaders as being more authentic than Trades-Based Workers and non-people leaders, respectively. These results support the findings of Chen, Li & Goh (2021) and Marín et al. (2019), of discrepancies being observed in perceptions across different levels of the organisation, in this case between Salaried/Administrative and Trade/Labour roles, and People Leaders and Non-People Leaders. With many of the People Leaders also self-reporting as Office Workers, this may indicate a potential for response bias and social desirability bias from respondents (Zikmund et al. 2013).

RQ 1e) What are the Trades-based and Office workers' perceptions of Safety Climate within an Australian Facility Management Company?

The mean Pre-Intervention scores for the seven NOSACQ-50 dimensions ranged from 3.23 to 3.35, and the mean Post-Intervention scores ranged from 3.17 to 3.37, out of a maximum score of 4.00. Scores >3.30 indicate a good level of alignment to the safety climate model, and scores 3.00-3.30 require slight improvement. Several dimensions saw a reduction in mean score compared to the Pre-Intervention sample, with an additional two dimensions needing slight improvement.

The Safety Climate results were affirmed in the qualitative data, with participants noting:

Interviewee 1: *I've got to admit safety culture is pretty good on this site.*

Interviewee 5: *I think [the Company] has a very strong safety culture.*

Analysis of variance (ANOVA) was conducted to compare the effect of respondent demographic profiles on the mean NOSACQ-50 score in both the Pre- and Post-Intervention data sets (refer Table 4.8 and Table 4.20, respectively).

The effect of *Role Type* on the Pre-Intervention mean NOSACQ-50 score was significant, [F (1,154) = 10.000, p=.002], indicating that the mean NOSACQ-50 score of those respondents in Salaried/Administrative roles (M=3.320; SD=0.412) is statistically higher than that of Trades/Labour roles (M=3.074; SD=0.469).

The effect of *People Leader* on the Pre-Intervention mean NOSACQ-50 score was also statistically significant, [F (1,154) = 5.269, p=.023], indicating that the mean NOSACQ-50 score of those respondents identifying as People Leaders (M=3.335; SD=0.386) is statistically higher than those not identifying as People Leaders (M=3.175; SD=0.476).

The effect of *Role Type* on the Post-Intervention mean NOSACQ-50 score was significant, [F (1,155) = 9.944, p=.002], indicating that the mean NOSACQ-50 score of those respondents in Salaried/Administrative roles (M=3.377; SD=0.393) is statistically higher than that of Trades/Labour roles (M=3.150; SD=0.469).

The effect of *People Leader* on the Post-Intervention mean NOSACQ-50 score was also statistically significant, [F (1,155) = 5.134, p=.025], indicating that the mean NOSACQ-50 score of those respondents identifying as People Leaders (M=3.392; SD=0.388) is statistically higher than those not identifying as People Leaders (M=3.236; SD=0.452).

This finding confirms that Office Workers and People Leaders in both the Pre- and Post-Intervention datasets perceive the Company's safety climate as more positive than Trades-Based Workers and non-people leaders, respectively. Similarly to the Authentic Leadership results, these findings support the literature observations of hierarchical discrepancies in perception across the organisation. In

addition, with many of the People Leaders also self-reporting as Office Workers, there may be a potential for response bias and social desirability bias from respondents (Zikmund et al. 2013), as well as a marked difference in perceived Safety Climate between the 'safe' office roles and workplaces to the higher risk Trades-Based workers.

RQ 1f) What is the Safety Performance of an Australian Facility Management Company?

Safety performance metrics for the Company were grouped into three categories: Safety Compliance, Safety Participation, and Occupational Injuries. Negative binomial regression was undertaken to compare the variance in safety performance between the Pre- and Post-Intervention Data Collection points. There was no statistically significant difference between the safety performance metrics across the two data collection points. The Pre- and Post-Intervention safety performance data is reported for each metric.

Safety Compliance

Safety Compliance performance metrics were identified as the number of Worksite Review completed, the number of Incidents reports, the number of Near Misses reported, and the number of Hazards reported.

- Hazard reporting was the main Safety Compliance activity undertaken across the Company, with a statistically non-significant increase in the number of hazards reported between the Pre-Intervention (M=45.250, S.D.=41.196) and Post-Intervention (M=56.333, S.D.=112.174) Data Collection points.
- Workgroups recorded an average of 26 Post-Intervention Worksite Reviews (M=26.333, S.D.=44.720), a statistically non-significant increase from the twenty Pre-Intervention Worksite Reviews (M=20.417, S.D.=35.556).
- Incident reporting across the two Data Collection points saw no statistically significant change, with an average of ten incidents reported per

workgroup Pre-Intervention (M=10.083, S.D.=12.369), and Post-Intervention (M=10.583, S.D.=12.176).

- There was low Near Miss reporting across the workgroups; however, there was a slight, statistically non-significant, increase in the number of Near Misses reported between Pre-Intervention (M=2.667, S.D.=3.551) and Post-Intervention (M=3.750, S.D.=6.426).

Safety Participation

Safety Participation performance metrics were identified as the number of Contributors Worksite Review, the number of Contributors to Hazard Reporting, the number of Safety Conversations reported, and the number of Contributors to Safety Conversations.

- Safety Conversation reporting was the primary Safety Participation activity undertaken across the Company, with a statistically non-significant increase in the number of Safety Conversations reported between the Pre-Intervention (M=363.000, S.D.=848.511) and Post-Intervention (M=393.833, S.D.=568.725) Data Collection points.
- An average of fourteen workers contributed to Safety Conversations per workgroup Post-Intervention (M=14.833, S.D.=11.384), a statistically non-significant increase from the twelve workers per workgroup contributing to Safety Conversation Pre-Intervention (M=12.833, S.D.=11.622).
- However, the number of contributors to Hazard reporting across the workgroups saw no statistically significant change between the Pre-Intervention (M=11.117, S.D.=10.616) and Post-Intervention (M=10.127, S.D.=11.093) Data Collection points.
- The number of Contributors to Worksite Reviews across the two Data Collection points saw no statistically significant change, with an average of three workers contributing to this activity per workgroup Pre-Intervention (M=3.000, S.D.=4.306), and Post-Intervention (M=3.250, S.D.=3.596).

Occupational Injuries

Occupational Injury performance metrics were identified as the number of Total Recordable Injuries and the number of All Injuries reported by workgroup.

- Total Recordable Injuries (Inj_TRI): no statistically significant change was observed in the number of Total Recordable Injuries by workgroups between the Pre-Intervention Data Collection (M=0.250, S.D.=0.482), and the Post-Intervention Data Collection (M=0.167, S.D.=0.389) point.
- All Injuries (Inj_All): there was a slight, non-statistically significant, increase in the number of All Injuries by workgroups between the Pre-Intervention Data Collection (M=2.667, S.D.=4.185), and the Post-Intervention Data Collection (M=3.583, S.D.=3.679) point.

Research Question 2

RQ 2: What are the respondents' perceptions of change to Authentic Leadership, Safety Climate and Safety Performance attributed to the Leadership, After-Action Review and Learning Team interventions of an Australian Facility Management Company?

Research question two aims to explain the perceived impact that the Project Interventions have, if any, on Authentic Leadership, Safety Climate and Safety Performance within the Australian Facility Management Company workplace.

Three distinct themes emerged from the Thematic Analysis of the qualitative data of the respondents' perceptions relating to Authentic Leadership, Safety Climate and Safety Performance. 'Authentically Leading Safety', 'Empowering & Engaging Teams', and 'Safe Operational Outcomes' described how the Company's core values of 'Personal Safety Leadership' and 'Care & Empathy' were demonstrated across the workgroups.

Respondents identified a positive change in the perception of leaders' demonstration of Authentic Leadership following the Leadership Intervention.

> **Interviewee 1:** *I definitely think the operations team and [Manager] are very authentic… I just find they really people focused. So, they'll ask if they're teams, what's wrong. And they'll always try and say, well, something from*

their perspective. And then they'll say, look, you know, I understand that this is the way we need to go about it.

Interviewee 2: *I think my, my shifting probably has changed a little bit around that workshop. And I think the workshop helped me put together our strategy for next twelve months as well... I'm a true believer that if somebody comes to me with a safety issue or concern, we action that immediately goes. I want to demonstrate to the contract that we are listening. We are listening to our workforce. The contract leadership team put together our safety commitments... I do definitely believe it's boots on the ground but is building relationships. It's actually having an understanding how people operate on the ground. Everyone's different. Everyone has a purpose. If people get things wrong, that's okay. That we learn by that. I'm not one that... For on this contract, we do something wrong, we get it better. I fundamentally don't believe abating people gets the right outcome. It is about working with someone to improve their processes, getting the best outcome next time.*

Interviewee 5: *I don't think personally I've changed. What I do have is, I have more confidence in, if there's anything that we wanted to do, we'd have no push-back. And that's probably more of a function of the team around me have grown and developed in this area.*

Trust and respect were a common phrase shared by respondents as part of being 'Empowered & Engaged Teams':

Participant C2: *It helps create just a confidence. You guys being confident in us, us being confident in management and knowing that we need your raise something you don't have to sort of whisper about it all. Mate just come straight out and say it if you do see it.*

Interviewee 5: *I always look at any relationship. That trust is a really important attribute that I seek. And if there's a level of trust, in the coalface / workforce, that what we're trying to do is the right way of going about it.*

This finding is supported by previous research and literature that suggests that trust is one way that supervisors can better influence employees. Conchie and Donald

(2009, p. 137) define trust as “an individual’s willingness to rely on another based on positive expectations that he or she will act safely or intend to act safely” (Conchie & Donald 2009, p. 137). Trust positively influences employees’ safety behaviour “because it increases their willingness to engage in behaviors that improve safety” (Conchie & Donald 2009, p. 137). This was evidenced in a general increase in the volume of Safety Conversations recorded during the study period and workers’ voluntary participation in After-Action Reviews.

Respondents did not identify the After-Action Review Intervention as having an impact on Authentic Leadership, Safety Climate or Safety Performance. While no targets were set for the number of AARs to be completed by workgroups across the Company, nineteen AARs were independently completed by workgroups and provided to the researcher. During the intervention period, managers shared feedback to their peers in their standing monthly Contract Manager’s meeting on safety and operational improvement identified through the AAR process. The completion of AARs demonstrated “Empowered & Engaged Teams”, including the elements of a safety-focused attitude, collaboration & teamwork, and sharing stories and demonstrating vulnerability.

Respondents did not identify the Learning Team Intervention as having an impact on Authentic Leadership, Safety Climate or Safety Performance. Similarly, to the AAR Intervention, the Learning Team Intervention did promote sharing stories and demonstrating vulnerability and engaging and empowering others to identify areas of concern and opportunities for improvement for the identified focus areas. Of the two Learning Teams undertaken, Interviewee 5 demonstrated a positive leadership response to the identified improvements required for Health and Wellbeing, further modelling the Company’s core value of ‘Care & Empathy’:

> **Interviewee 5:** *When you ask the question is someone fit for work, generally it's always been thought of well that person has a sore ankle you know, so they probably shouldn't be on their feet all day doing whatever activity it is that they need. And we probably never really thought too much about, well, look that person has, you know, had a significant challenge in their, in their relationship, or there's been an issue with a family member, or something along those lines. And fundamentally you know those types of*

impairments can be more challenging than someone that might be hungover or someone that didn't get enough sleep last night because their minds not on the job. So, I guess we're starting to understand that you know the appreciation and, you know, the correlation of people that are mentally healthy as well as being as being fit for work from that process. So psychological, so I think we're only scratching the surface to be honest and where we need to be. I feel like we've come a long way in the last 12 months, but I feel like we've got a long, a lot further to come… I fundamentally don't believe that people ask for help enough. So, it's about getting people to recognise when they might need help.

Respondents considered worker participation, through Safety Conversations being recorded, the number of Safety Conversation Contributors, and completing Worksite Reviews, as having an impact on the safety performance of the Company through worker engagement, learning and improvement. Respondents generally perceived an improvement in performance within their workgroup and across the Company:

> **Interviewee 2:** *[S]afety had a number of initiatives that we've been driving on the contract from embedding Noggin, to making sure our leadership team are being visible out on onsite, really pushing the PPE process out to our subcontractors, doing safety audits. And we've seen a big improvement with our LTI frequency and MTI frequency rate dropped down dramatically. But it's really for me it was about boots on the ground and being visible out onsite.*

> **Interviewee 5:** *[T]he VIC / TAS business does between 50 and 60 per cent of all of [entire Company's] safety conversations. And so that's something that we're proud of. It means that all our people are engaging in safety. It's not so much about volume per se. I guess the other metric that we like to try and measure is we call it contributors. So, it's the number of contributors to safety conversations, and we think that's just as important as the total number of safety conversations because that means we've got more people that are out and about talking about safety.*

6.3.2 Study Propositions

Proposition 1: Authentic Leadership and Positive Safety Climate are positively related to Safety Performance in the context of an Australian Facility Management Company.

It was found that Authentic Leadership and Positive Safety Climate are positively correlated, however, had a mixed effect on the Safety Performance measures of the Australian Facility Management Company. Authentic Leadership was observed to have a statistically significant predictor effect on four safety performance metrics, supporting previous research that Authentic Leadership improves safety performance (Wu, T.-C. et al. 2008; Lekka & Healey 2012; Cavazotte et al. ; Nielsen et al. 2013). Positive Safety Climate was also observed to have a statistically significant predictor effect on three safety performance metrics, supporting previously identified linkages between safety climate and safety performance in the literature (Zohar 1980; Clarke 2006; Zhou et al. 2008; Stemn et al. 2019).

Interview participants pointed to the perceived improvement in performance within the qualitative data. Worker participation, through recording Safety Conversations, the number of Safety Conversation Contributors, and completing Worksite Reviews, was identified by participants as having a perceived impact on the safety performance of the Company as a result of worker engagement, learning and improvement. This has been supported through the Thematic Analysis, where it was identified that 'Authentically Leading Safety' led to 'Empowered & Engaged Teams' and 'Safe Operational Outcomes'.

The quantitative and qualitative data converge to support the proposition that Authentic Leadership and Positive Safety Climate are positively related to Safety Performance in the context of an Australian Facility Management Company.

Proposition 2: The Leadership, After-Action Review and Learning Team interventions have a positive impact on Authentic Leadership, Safety Climate and Safety Performance as perceived by an Australian Facility Management Company workers.

Focus Group and Key Stakeholder Interview identified a positive change in the perception of leaders' demonstration of Authentic Leadership following the

Leadership Intervention, with particular identification of leaders' demonstration of the Company's core value of 'Care & Empathy' and the importance of trust and respect as part of being 'Empowered & Engaged Teams'. This was evidenced in a general increase in the volume of Safety Conversations recorded during the study period and workers' voluntary participation in After Action Reviews.

However, the After-Action Review and Learning Team Interventions was not identified by respondents as having an impact on Authentic Leadership, Safety Climate or Safety Performance. The voluntary completion of AARs and workers' participation in the Learning Teams demonstrated "Empowered & Engaged Teams", including the elements of a safety-focused attitude, collaboration & teamwork, and sharing stories and demonstrating vulnerability to identify areas of concern and opportunities for improvement for the identified focus areas. These findings provide an example of authentically leading safety by involving others in the process to encourage the adoption of safe practices across various workgroups of the Company (Pilbeam et al. 2016).

While evidence that the Leadership Intervention had a positive impact on Authentic Leadership, Safety Climate and Safety Performance, the lack of findings regarding the impact of After Action Reviews and Learning Teams converge to reject the proposition that the Leadership, After-Action Review, and Learning Team interventions have a positive impact on Authentic Leadership, Safety Climate and Safety Performance as perceived by an Australian Facility Management Company workers.

6.4 STUDY SIGNIFICANCE

The case of the study, an Australian Facility Management Company, has a Zero Harm statement of intent and an underlying belief that all injuries are preventable. This Zero Harm statement of intent is underpinned by two core values of 'Personal Safety Leadership' and 'Care & Empathy'. While safety leadership is highlighted as a value of the Company, there is no measure of safety leadership prioritisation or impact within the workforce and no understanding of the Company's needs to improve safety performance.

This study is significant for the Company as it seeks to implement a work-based project to close the identified gaps in safety leadership and provide the Company with an evidence-based measure of its safety leadership prioritisation. Through consultation with the researcher's manager and operational executive sponsor, the work-based project, embedded within the mixed-method design, included developing and delivering a safety leadership workshop, introducing an After-Action Review process, and conducting a series of Learning Teams.

As a result of the study, the case was provided with evidence-based insights into the implementation of work-based interventions of the interaction between Authentic Leadership, Safety Climate and Safety Performance. The Company was then able to understand how safety leadership is prioritised within the Company's workgroups. The work-based project provided the Company with tools and processes to improve safety and operational performance within the workplace.

This case study is significant for other practitioners, both HSWB and facility management professionals, as it provides a practice-based approach to explain the phenomenon of authentic leadership, safety climate and safety performance within the Australian facility management industry. This study contributes to the body of knowledge as a work-based intervention that aims to improve safety performance (Hale, Guldenmund, van Loenhout & Oh 2010).

6.5 STUDY CONTRIBUTIONS

In undertaking the current study, the researcher aimed to contribute to their professional practice, the body of knowledge, and to develop as a scholarly, "advanced practice professional" (Fergusson, Allred & Dux 2018). Therefore, the contributions of this study are presented in three parts: contributions to the knowledge of professional practice, contributions to the knowledge of theory, and the practitioner reflections and contributions.

6.5.1 Contributions to the Knowledge of Professional Practice

The study aimed to provide evidence-based insights into the implementation of work-based activities and explore the relationship between Authentic Leadership and Safety Performance within the workplace. As an insider researcher, the

researcher was well-positioned to conduct this research and contribute to industry decision making and professional practice.

The research problem was identified as the Company held safety leadership as a core value of its operations, however there was no measure of safety leadership prioritisation or impact within the workforce. Furthermore, while the Company measured injury rates, there was no other understanding of the organisation's needs to improve safety performance.

It is proposed that the current study has made the following original knowledge contributions to professional practice:

At an organisational level, the ALI and NOSACQ-50 survey results provide a benchmark for the Company within the Australian facility management industry to measure safety leadership prioritisation within the Company. While there were no statistically significant differences in workers' perceptions of authentic leadership and safety climate between workgroups, it is noted that homogeneity of scores should be more present in workgroups that interact with each other frequently. Subject to the limitations discussed in Section 3.7, the survey results suggest areas of positive safety climate within the workforce and areas of potential improvement. These safety climate and authentic leadership insights were able to be incorporated by the Company in the development of their HSWB strategies for the Victorian / Tasmanian operational teams.

The work-based project contributed to the operation of the Company by increasing the safety leadership capabilities of leaders within the region's workgroups, demonstrating a positive impact of authentic leadership and safety climate within the Company. Leaders within the Company became more comfortable sharing vulnerability and building relationships with their teams, resulting in empowered and engaged teams. Workgroups proactively engaged in AAR processes to improve safe operational outcomes for their tasks and created feedback loops on their existing pre-task risk assessment processes. In addition, the Company engaged in two Learning Teams to understand work-as-done versus work-as-imagined and implemented tangible actions to achieve operational and employee health and wellbeing outcomes.

As a result of the study, the measurement of safety performance within the Company was able to shift from a focus on lagging indicators of LTIFR and TRIFR injury rates, to align with an understanding of Safety Compliance, Safety Participation, and Occupational Injuries. The results of this study were able to provide empirical data to highlight the impact that Authentic Leadership and Positive Safety Climate had on the Company's safety metrics across the workgroups, in part helping to resolve part of the research problem.

The study highlights the differences in perceptions of authentic leadership and safety climate between trades-based workers and office-based workers as noted within an Australian Facility Management Company. FM practitioners should be aware of the differences in perceptions between these workgroups when looking to introduce workplace interventions. HSWB and FM practitioners should consider how workers can be better engaged through work-based interventions to improve their effectiveness, and their impact on workers' perceptions on safety leadership and safety climate.

This study has tentatively explored the notion of what is deemed by the researcher as Authentic Safety Leadership. Combining the quantitative and qualitative data analysis undertaken in the current study provided a richer understanding of the Company's safety performance. The thematic analysis elicited a perspective from the workforce that 'Authentically Leading Safety' led to 'Empowered & Engaged Teams' and 'Safe Operational Outcomes'.

6.5.2 Contributions to the Knowledge of Theory

It was noted that health and safety research generally focus on high-risk organisational settings, and there is limited representation in lower-risk setting such as facilities management. The use of the ALI for measuring authentic leadership and NOSACQ-50 for measuring safety climate is not new. However, this research has demonstrated its utility in the Australian facility management context and in using these survey instruments together. The pragmatic, mixed-method approach within the work-based context enhanced the reliability and validity of the results and provided further knowledge for undertaking safety research by other practitioner-researchers. The mixed-method approach is also the first of its kind to explain the

nature of the possible relationship between Safety Leadership, through a lens of Authentic Leadership, and Safety Performance within the Australian context.

It is proposed that the current study has made the following contributions to the knowledge of theory:

Body of Knowledge: The literature review within the facility management context produced minimal results. There is a lack of safety research in lower-risk settings such as the facility management industry related to safety leadership, safety climate, and safety performance. This thesis contributes to closing the gap in the literature within the context of the facility management industry, particularly from a practitioner-research perspective.

Body of Knowledge: There is tentative evidence supporting the idea of Authentic Safety Leadership as a new construct; however, further research would need to determine the definition, parameters and validity of this construct.

Methodological: Safety Performance. Self-reporting survey methodologies have broadly been deployed to explore individuals' perspectives of organisational safety performance, specifically safety compliance, safety participation and occupational injuries (Griffin & Neal 2000; Vinodkumar & Bhasi 2010; Hon et al. 2014; Guo et al. 2016). This thesis contributes to methodological approaches to measuring safety performance using quantifiable performance metrics rather than potentially biased self-reported responses to organisational safety performance (Zikmund et al. 2013).

Methodological: NOSACQ-50. The current study tested demonstrated the utility of the NOSACQ-50 instrument within the context of an Australian Facility Management Company, yielding high internal validity and reliability across both the Post-Intervention and Post-Intervention Data Collection points. However, the factor analysis did not converge on the seven-factor structure as suggested by the original instrument. While explanatory in nature, this did not impact the current study but further contributes to the methodological findings of this instrument and points to a potential need to revisit the factor designation of the NOSACQ-50 instrument.

Methodological: ALI. The current study tested demonstrated the applicability of the ALI instrument within the Australian context and that of the facility management industry. High internal validity and reliability results were obtained across both the Post-Intervention and Post-Intervention Data Collection points. Further, the factor analysis of the ALI successfully converged on the four-factor structure as suggested by the original instrument.

6.5.3 Contributions to the Practitioner

This thesis presents the intersection between the research and practice domains of the practitioner-researcher as they engage in a practice-based pedagogy of work-based research and learning. Undertaking the current study has contributed to the researcher's lifelong learning and continual professional development as a Certified Chartered Generalist OHS Professional.

Undertaking the DPRS program has allowed the researcher to develop their reflective practice as a work-based learning method. Formal, informal and non-formal learning (Benozzo & Colley 2012) make up the researcher's own professional learning and development journey. In completing the DPRS program, the researcher reflected on the learning objectives set at the commencement of this professional doctorate, aligned to a taxonomy of learning areas, adapted from Bloom's Taxonomy (Bloom 1956). The Learning Objectives for this doctoral journey included:

> *LO1 – Intellectual Capabilities:* Critically evaluate research studies associated with safety leadership and safety climate to assess their quality and applicability in improving safety performance and reporting the evidence in a doctoral dissertation.
>
> *LO2 – Communication Capabilities:* demonstrate subject matter expertise through practical communication skills, including internal and external presentations and articles for publication.
>
> *LO3 – Methodological Capabilities:* develop a research methodology to evaluate the relationship between authentic leadership and safety performance.

LO4 – Intellectual Capabilities: develop and implement a work-based project focusing on safety leadership capabilities, improving safe operational outcomes of the Company.

LO5 – Intellectual Capabilities: contribute to the health and safety profession's body of knowledge by completing a doctoral dissertation on the relationship between authentic leadership and safety performance.

Table 6.2 outlines the activities and tasks completed during this doctoral journey and how they have contributed to achieving the learning objectives of intellectual, methodological and communication capabilities.

Table 6.2 Researcher's DPRS Learning Objectives

Activity/Tasks	**Year Completed**	**Learning Objective Achieved**
Confirmation of Candidature Process	2017	LO1 – Intellectual Capabilities
		LO2 – Communication Capabilities
		LO3 – Methodological Capabilities
Literature Review and Methodology Synthesis	2017	LO1 – Intellectual Capabilities
		LO3 – Methodological Capabilities
Ethics Approval Process	2017	LO2 – Communication Capabilities
		LO3 – Methodological Capabilities
Post-Intervention Data Collection Completed	2017	LO2 – Communication Capabilities
		LO3 – Methodological Capabilities
Conference Presentation: Re-imagining Education for Democracy Summit – Springfield, Australia	2017	LO2 – Communication Capabilities
Collaboration on Journal Articles: Interdisciplinary Journal of eSkills and Lifelong Learning	2018	LO2 – Communication Capabilities
		LO5 – Intellectual Capabilities
Undertake Work-Based Project	2018	LO2 – Communication Capabilities
		LO4 – Intellectual Capabilities
Post-Intervention Data Collection Completed	2018	LO2 – Communication Capabilities
		LO3 – Methodological Capabilities
Focus Group Interviews Completed	2019	LO2 – Communication Capabilities
		LO3 – Methodological Capabilities
Completed SPSS Training and Statistical Consulting Unit Support	2019	LO3 – Methodological Capabilities
Conference Presentation: AIHS National Health & Safety Conference – Sydney, Australia	2019	LO2 – Communication Capabilities
		LO5 – Intellectual Capabilities
Quantitative and Qualitative Data Analysis	2020	LO3 – Methodological Capabilities
Completion of Thesis and DRPS Program	2022	LO1 – Intellectual Capabilities
		LO2 – Communication Capabilities
		LO5 – Intellectual Capabilities

6.5.4 Summary of Contributions

Undertaking the current doctoral journey has produced several contributions, as outlined above, to the professional practice, the body of knowledge, and to the practitioner-researcher themselves – the 'triple dividend' of work-based research and learning (Fergusson, Allred, Dux & Muianga 2018). Advancing the professional practice has been achieved by increasing leaders' safety leadership capabilities within the Company, improving safe operational outcomes for the work tasks through AAR and Learning Teams, and the ALI and NOSACQ-50 survey results' contributing to organisational strategies. Contributions to the knowledge of theory and the profession's body of knowledge were made by demonstrating the utility of the ALI and NOSACQ-50 instruments within an Australian Facility Management Company, yielding high internal validity and reliability results. Further, the undertaking of work-based research within a non-high-risk setting contributes to closing the gap in the literature in this area. Finally, the researcher has developed professionally by gaining intellectual, methodological, and communication-related capabilities in line with their doctoral learning objectives. The contributions of this study are significant and validate the importance of work-based research for the valuable 'triple-dividend' – professional practice, the body of knowledge, and researcher outcomes.

6.6 STUDY LIMITATIONS

This work-based research study aimed to explore the relationship between Authentic Leadership and Safety Performance in an Australian Facility Management Company. Limitations of the current research have been discussed throughout this thesis. Specifically, Section 3.7 presented the current study's limitations and the relevant strategies to overcome any methodological limitations.

The study was underpinned by an explanatory mixed-method using an embedded, single-case research design, resulting in a unique contribution to professional practice knowledge. The data collected and results from the study provide valuable insights to the Company. However, these results must be interpreted carefully, and several limitations must be considered:

Theory. The primary limitation of the current study relates to the contribution to the theory and the ability to generalise the findings. Authentic leadership is a relatively new leadership theory (Divya & Suganthi 2017), and the study of the relationship between authentic leadership, safety climate, and safety performance lacks theoretical underpinnings. While the study is justifiably explanatory, further research is required to confirm the insights as justification of theoretical advancement.

Sampling. Even though the sampling was purposive and aimed at the specific population of the Company, it cannot be deduced that the sample represents the population of interest or the facility management industry at large. The ability to generalise findings and conclude a cause-effect relationship is restricted due to the homogeneity of the sample population of the Company (Leedy & Ormrod 2015). While the behaviours displayed by leaders of the Company and respondents' perception of safety climate are considered homogenous, the findings cannot be generalised beyond the Company.

Demographics. Sample demographics are essential to achieve a representative sample of the population of interest. While adequate sample sizes were achieved for both the Post-Intervention and Post-Intervention Data Collection points, the survey responses lacked representation from the trades/field-based roles within the Company. There was a higher than expected response rate for people leaders (supervisors, coordinators and managers), which may suggest that the results are not fully representative of the workers on the ground. Further research targeting field-based roles may provide further insights into their perceptions of the Company's safety leadership and safety climate.

Confounding Variables. It is acknowledged that work-based research is complex and "messy" (O'Leary & Hunt 2016, p. 10), and there was an inability to control for various confounding variables. These included the inability to control for a number of changes which occurred in the organisation during the study period and the impact that workgroups in different industry settings may have different attitudes to risk (Pilbeam et al. 2016).

Following the Pre-Intervention data collection, workgroups Oscar, Papa, Quebec and Romeo, which accounted for 21.8% of the dataset's total respondents, did not continue operations into the Post-Intervention data collection. Two new contracts commenced during the study period, workgroups Golf and Kilo, who participated in the Project Interventions, and Post-Intervention data collection, however not the Pre-Intervention data collection. The conclusion and commencement of these contracts was not foreseen at the commencement of the study, and not able to be prevented by the researcher.

A further confounding variable emerged during the study period, with changes to the senior leadership team being made above that of the operational executive sponsor following the acquisition of the Company. While the executive sponsor for the study remained the same, the potential for disruption, anxiety and uncertainty throughout the Company was identified as an uncontrollable variable during the study period.

The various workgroups of the Company provided facility management for clients across a diverse portfolio of government and private sector industries, including education, utilities, social housing, corrections and aviation. Throughout the study the potential impact of these workgroups operating in different industry settings emerged as a potential confounding variable as workers in different industries may have different attitudes and perceptions towards risk (Pilbeam et al. 2016).

Self-report Data. A common area of concern of survey instruments is their reliance on self-report data, with problems associated with response and social desirability biases (Zikmund et al. 2013). The results of the ALI and NOSACQ-50 survey instruments were triangulated against the focus group and key stakeholder interviews to establish a level of reliability. Leedy and Ormrod (2015) note that the complete impact of bias resulting from self-reported data cannot be eliminated, and the use of 360° feedback questionnaires and additional qualitative measures may provide better opportunities to address this limitation further. To reduce the bias associated with self-reported safety compliance, participation and involvement in

occupational injuries, safety performance metrics were sourced from the Company's company records and grouped into the three safety performance areas.

The quantitative data collected through the study in the ALI and NOSACQ-50 instruments identified that respondents identifying as Office Workers and/or People Leaders, had a more favourable perception on their leaders as being more authentic, and the Company as having a more positive safety climate than that of Trades-Based Workers and non-people, respectively. These results support the findings of Chen, Li & Goh (2021) and Marín et al. (2019), of discrepancies being observed in perceptions across different levels of the organisation, in this case between Salaried/Administrative and Trade/Labour roles, and People Leaders and Non-People Leaders, and potential biases associated with social desirability.

Methodology. EFA has been criticised for producing sub-optimal outcomes if poorly implemented, with the results of EFA subjectively determined by the researcher (Williams et al. 2010; Watkins 2018). The researcher made pragmatic decisions to achieve the best outcomes for the EFA (Watkins 2018), including selecting the best rotation methods to minimise the risk of being sample-specific and lacking generalisability (Hair et al. 2006). To reduce the bias associated with this limitation, the researcher implemented a review process throughout the study, gaining supervisor input.

Insider Research. Work-based research often benefits from insider researchers with proximity to the research phenomena. Insider researchers have intimate knowledge of the work context (Teusner 2016), and can provide deeper meaning using their insights and familiarity with the phenomenon's history. However, a disadvantage of being an insider researcher is that of the researcher having biased views due to their being an "actor within the setting" (Teusner 2016, p. 86) being researched. The use of mixed methods in the present study aimed to provide "a balance between subjectivity and objectivity" (Doyle et al. 2016, p. 265), in the context of the pragmatist worldview in an attempt to hold the tension between the subjectivity and objectivity of the researcher. The ALI and NOSACQ-50 survey outcomes limited the possibility of insider researcher bias. As such, the empirical results supporting the overall finders were sound. It is proposed that despite the

potential bias associated with being an insider researcher, the benefits gained by having the researcher as an industry expert outweighed the effects of bias.

6.7 SUGGESTIONS FOR FUTURE RESEARCH

Based on the findings of this research study, and taking into consideration the limitations presented above, the following opportunities for future research are proposed.

Although this has made a contribution by undertaking a practice-based study to explore the relationships between authentic leadership and safety climate and measure the impact on safety performance, applying a practice-based pedagogy through the implementation of work-based project activities within an Australian Facility Management Company, it is clear in throughout the literature that such studies within the facility management industry are limited. This research responds to the importance of undertaking research in often-overlooked industries (Hon et al. 2014). Further studies on facility management companies within Australia would provide further research to support the findings of this study.

Work-based research is inherently complex and "messy" (O'Leary & Hunt 2016, p. 10), and experimental design may not be practical to implement. This study has demonstrated the value of the case study approach to investigate "a contemporary phenomenon in depth and within its real-life context" (Yin 2009, p. 18). The further use of case study approaches to work-based inquiry allows for the most appropriate research method to be applied to the context of the case and the research problem. The use of single-case and multiple-case designs may provide valuable insights into the phenomenon of authentic leadership, safety climate and safety performance within the facility management industry.

The results of this study confirm that the ALI and NOSACQ-50 survey instruments were not sensitive enough to detect an impact due to Project Interventions. Future studies should consider alternative methods such as observations, ethnographic interviews in the field, or short, pulse assessment surveys that participants fill in once a week to increase the potential sensitivity to the measurements. In addition, future research which considers both Office Workers and

Trades-Based Workers should review deploy alternative data collection methodologies for use by participants. Where technology is not as common-use throughout the organisation, paper-and-pencil options would also reduce the barrier to entry for participation.

Given the explanatory nature of the study, further studies may be warranted to confirm the insights around the relationship between authentic leadership, safety climate, and safety performance to advance the theoretical foundations of this relationship, however does not suggest that the concepts of leadership and climate drive change in the safety performance of the Company. Future studies on authentic leadership and its relationship with safety performance could be expanded across various organisations and/or industries to explore possible generalisable findings and potential cause-effect relationships, ensuring adequate representation from the field-based workforce.

As a secondary data set, further statistical analysis is possible. These include, the potential to conduct confirmatory factor analysis, structural equation modelling, and further multivariate tests for significance and variance. The study identified issues associated with the NOSACQ-50 instrument which failed to satisfactorily converge on the seven-factor EFA extraction as expected by the original research, future studies should consider revisiting the factor structure of the NOSACQ-50 instrument.

There is tentative evidence to support the idea of Authentic Safety Leadership as a new construct. Further research is required to define Authentic Safety Leadership as a construct, articulate the construct parameters and test the validity of this construct. Future studies may expand the focus of research on authentic safety leadership beyond just safety performance, and explore the relationship with organisational performance, more broadly.

Finally, the study attempted to align organisational safety performance metrics with the safety performance constructs of safety compliance, safety participation and occupational injuries to reduce the risk of bias from self-reported responses to these performance measures. Further research on the suitability of this alignment should

be undertaken to determine its reliability and adequacy a measures of safety performance.

6.8 PRACTITIONER-RESEARCHER REFLECTIONS

Approaching the end of my doctoral journey marks a perfect opportunity to stop and reflect. Reflect on my practice in action and undertaking doctoral research within my practice.

I commenced the DPRS program to apply academic rigour to my professional practice and the workplace and satisfy a personal desire for my continued growth and development. Since completing my undergraduate degree, I've developed a passion for lifelong learning as I completed further postgraduate studies to establish myself as a well-rounded HSWB professional. Over this time, I became more aware of the importance of evidence-based practice and the learning opportunities of reflective practice, such as prevalent within the teaching and medical professions. My sense was that similar approach in HSWB is needed.

On reflection, I was fortunate to have both a supportive manager and Company willing to participate in a work-based research project. This is not something the Company has previously been involved in, however senior leaders showed a great deal of openness and vulnerability in wanting to better understand how safety leadership is prioritised and to be involved in project interventions.

My experiences of adding research to my practice have resulted in deepening my knowledge in the areas of facility management, safety leadership, safety climate and safety performance, and importantly the opportunity to execute a mixed-method research methodology in my practice context. By combining the quantitative survey instruments with the qualitative focus groups and interview data I was able to appreciate the importance of combining depth of understanding with breadth of application. This coupled, with implementing a work-based project required me as a practitioner to develop interventions drawing from evidence-based practice available in the literature and my research insights.

As a result of adding doctoral research to my work, I have learned to be more considered in my approach to work-based projects and interventions, and have

improved my rigour in understanding the 'why' and 'how' of an intervention rather than jumping immediately to 'what' is being implemented. By undertaking a mixed-method methodology through my doctorate research, I have learned the value and richness of qualitative data and how this can contribute to explaining superficially apparent problems.

I have had the opportunity to receive external peer review of the body of my work throughout my doctoral research, which has been a humbling and constructive experience, providing a catalyst for improvement and growth. I have learned to have greater insight to my own biases and have been challenged to improve the clarity and effectiveness of my writing, which has benefited me as a practitioner. Throughout this experience, I have been given moments to shift my own beliefs and mindset towards of learning and growth. While I have learned a great deal throughout this doctoral journey, I have also benefited from having a new perspective to view myself through, both as a practitioner and a researcher.

6.9 CONCLUSION

This chapter has discussed the current study's research findings, triple-dividend contributions, limitations of the research, and potential opportunities for future research. Taking a pragmatist worldview allowed the researcher an opportunity to explore the relationship between authentic leadership and safety performance from a real-world and applied perspective but within an academically rigorous approach to work-based research. As such, this explanatory research has investigated the relationship between safety leadership, safety climate, and safety performance in a manner that was able to contribute to the professional practice, theory, and the researcher's own development.

This work-based research emerged from professional interest to investigate the relationship between safety leadership and safety performance and a desire to see more evidence-based practice within the profession. By undertaking the literature review for the current study, the researcher gained insights from Australian and International experts to robustly explore the three constructs of safety leadership, safety climate and safety performance. During this study, the researcher engaged in

a work-based project that contributed to the operation of the Company through increasing the safety leadership capabilities of leaders, creating feedback loops opportunities through the AAR processes, and facilitating Learning Teams to understand work-as-done versus work-as-imagined and implemented tangible actions to operational and employee health and wellbeing outcomes.

This thesis has contributed to the knowledge of theory by demonstrating the applicability of two independent survey instruments, the ALI and NOSACQ-50, within an Australian Facility Management Company, with high internal validity and reliability, further expanding health and safety research beyond the high-risk context. Finally, undertaking the Doctor of Professional Studies has established the researcher as a scholarly, advanced practice professional with the curiosity and capacity to contribute to the HSWB field.

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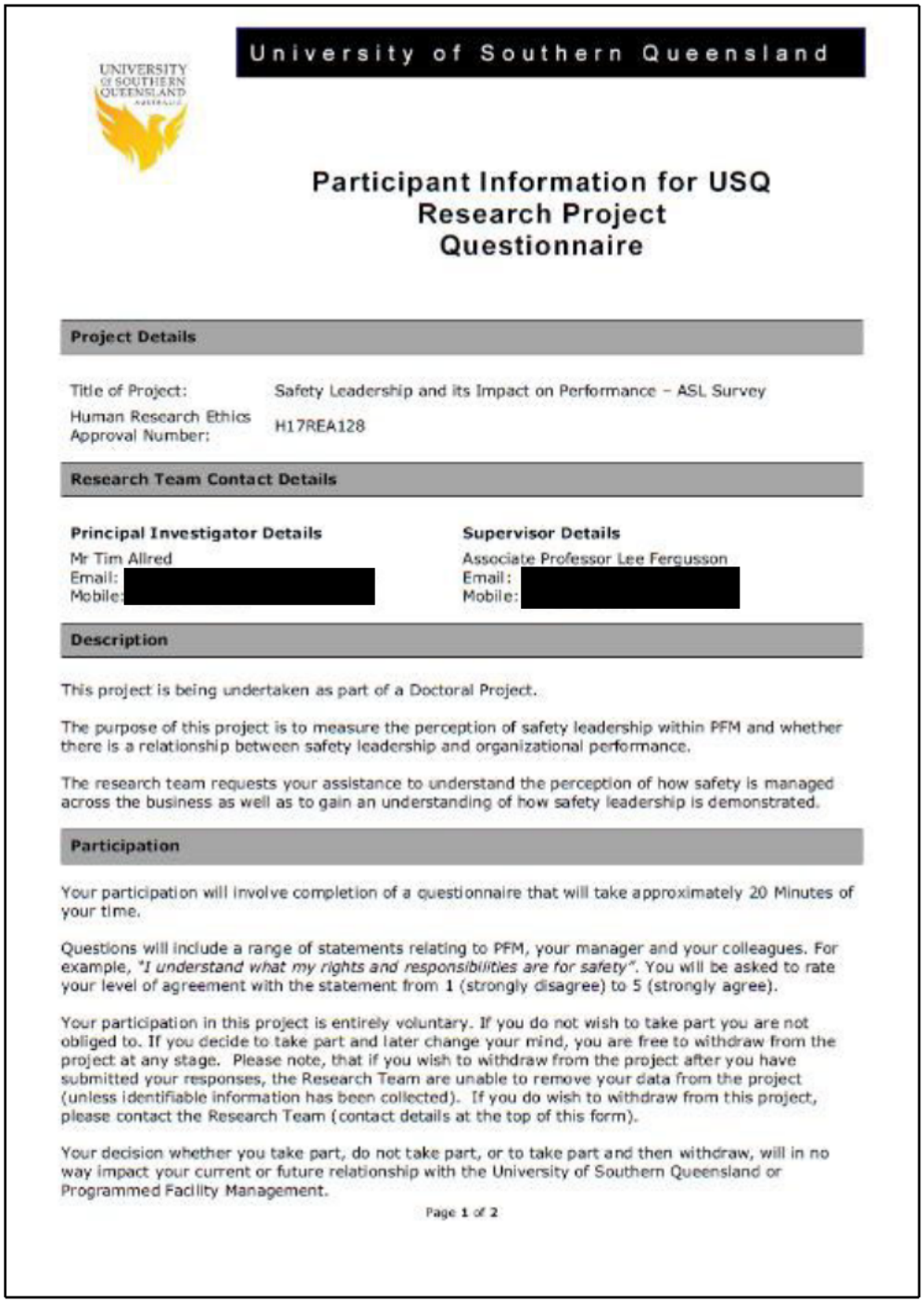
APPENDICES

Appendix A

Participant Information Sheets

Participant Information Sheet – Focus Group/Interview



University of Southern Queensland

Participant Information for USQ Research Project Questionnaire

Project Details

Title of Project: Safety Leadership and its Impact on Performance – ASL Survey

Human Research Ethics Approval Number: H17REA128

Research Team Contact Details

Principal Investigator Details
Mr Tim Allred
Email:
Mobile: [redacted]

Supervisor Details
Associate Professor Lee Fergusson
Email:
Mobile: [redacted]

Description

This project is being undertaken as part of a Doctoral Project.

The purpose of this project is to measure the perception of safety leadership within PFM and whether there is a relationship between safety leadership and organizational performance.

The research team requests your assistance to understand the perception of how safety is managed across the business as well as to gain an understanding of how safety leadership is demonstrated.

Participation

Your participation will involve completion of a questionnaire that will take approximately 20 Minutes of your time.

Questions will include a range of statements relating to PFM, your manager and your colleagues. For example, *"I understand what my rights and responsibilities are for safety"*. You will be asked to rate your level of agreement with the statement from 1 (strongly disagree) to 5 (strongly agree).

Your participation in this project is entirely voluntary. If you do not wish to take part you are not obliged to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage. Please note, that if you wish to withdraw from the project after you have submitted your responses, the Research Team are unable to remove your data from the project (unless identifiable information has been collected). If you do wish to withdraw from this project, please contact the Research Team (contact details at the top of this form).

Your decision whether you take part, do not take part, or to take part and then withdraw, will in no way impact your current or future relationship with the University of Southern Queensland or Programmed Facility Management.

Page 1 of 2

Expected Benefits

It is expected that this project will provide some direct benefit to you through improved safety leadership within your workgroup. However, it may benefit Programmed Facility Management through improved safety and organisational performance.

Risks

There are no anticipated risks beyond normal day-to-day living associated with your participation in this project.

Privacy and Confidentiality

All comments and responses will be treated confidentially unless required by law.

The names of individual persons are not required in any of the responses.

Any data collected as a part of this project will be stored securely as per University of Southern Queensland's Research Data Management policy.

Consent to Participate

Clicking on the 'Submit' button at the conclusion of the questionnaire is accepted as an indication of your consent to participate in this project.

Questions or Further Information about the Project

Please refer to the Research Team Contact Details at the top of the form to have any questions answered or to request further information about this project.

Concerns or Complaints Regarding the Conduct of the Project

If you have any concerns or complaints about the ethical conduct of the project you may contact the University of Southern Queensland Ethics Coordinator on (07) 4631 2690 or email ethics@usq.edu.au. The Ethics Coordinator is not connected with the research project and can facilitate a resolution to your concern in an unbiased manner.

Thank you for taking the time to help with this research project. Please keep this sheet for your information.

Participant Information Sheet – Focus Group/Interview

University of Southern Queensland

Participant Information for USQ Research Project Interview

Project Details

Title of Project:	Safety Leadership and its Impact on Performance
Human Research Ethics Approval Number:	H17REA128

Research Team Contact Details

Principal Investigator Details

Mr Tim Allred
Email:
Mobile: [redacted]

Supervisor Details

Associate Professor Lee Fergusson
Email:
Mobile: [redacted]

Description

This project is being undertaken as part of a Doctoral Project.

The purpose of this project is to measure the perception of safety leadership within PFM and whether there is a relationship between safety leadership and organizational performance.

The research team requests your assistance to understand the perception of how safety is managed across the business as well as to gain an understanding of how safety leadership is demonstrated.

Participation

Your participation will involve participation in an interview that will take approximately 30 Minutes of your time.

The interview will take place at a time and venue that is convenient to you.

Questions may include 'What were your learnings from being part of the [After Action Review / Appreciative Investigation]?' or 'Do you think the [After Action Review / Appreciative Investigation] process has any impact on workplace health and safety? How?'

The interview will be audio recorded. Transcriptions will be made available for your review via email. Amendments to the transcript is required within 20 business days of receipt of the transcript.

Your participation in this project is entirely voluntary. If you do not wish to take part you are not obliged to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage. You may also request that any data collected about you be destroyed. If you do wish to withdraw from this project or withdraw data collected about you, please contact the Research Team (contact details at the top of this form).

Your decision whether you take part, do not take part, or to take part and then withdraw, will in no way impact your current or future relationship with the University of Southern Queensland or Programmed Facility Management.

Expected Benefits

It is expected that this project will provide some direct benefit to you through improved safety leadership within your workgroup. However, it may benefit Programmed Facility Management through improved safety and organisational performance.

Risks

There are no anticipated risks beyond normal day-to-day living associated with your participation in this project.

Privacy and Confidentiality

All comments and responses will be treated confidentially unless required by law.

An audio recording the interview will be taken to assist with transcribing the interview responses. You will have the opportunity to verify the comments and response of the interview transcription prior to final inclusion. The audio recording will be accessed by the research team for the purposes of this doctoral project only.

If you would prefer to participate without being recorded, please inform the researcher prior to the commencement of the interview.

A summary of the research results will be made available to participants. If you would like a copy of the research results, please contact the Research Team.

Any data collected as a part of this project will be stored securely as per University of Southern Queensland's Research Data Management policy, and may be used for future research purposes.

Consent to Participate

We would like to ask you to sign a written consent form (enclosed) to confirm your agreement to participate in this project. Please return your signed consent form to a member of the Research Team prior to participating in your interview.

Questions or Further Information about the Project

Please refer to the Research Team Contact Details at the top of the form to have any questions answered or to request further information about this project.

Concerns or Complaints Regarding the Conduct of the Project

If you have any concerns or complaints about the ethical conduct of the project you may contact the University of Southern Queensland Ethics Coordinator on (07) 4631 2690 or email ethics@usq.edu.au. The Ethics Coordinator is not connected with the research project and can facilitate a resolution to your concern in an unbiased manner.

Thank you for taking the time to help with this research project. Please keep this sheet for your information.

Appendix B

Consent Form

Questionnaire

University of Southern Queensland

Consent Form for USQ Research Project Questionnaire

Project Details

Title of Project:	Safety Leadership and its Impact on Performance
Human Research Ethics Approval Number:	H17REA128

Research Team Contact Details

Principal Investigator Details
Mr Tim Allred
Email:
Mobile: [redacted]

Supervisor Details
Associate Professor Lee Fergusson
Email:
Mobile: [redacted]

Statement of Consent

By signing below, you are indicating that you:

- Have read and understood the information document regarding this project.
- Have had any questions answered to your satisfaction.
- Understand that if you have any additional questions you can contact the research team.
- Understand that you are free to withdraw at any time, without comment or penalty.
- Understand that you can contact the University of Southern Queensland Ethics Coordinator on (07) 4631 2690 or email ethics@usq.edu.au if you do have any concern or complaint about the ethical conduct of this project.
- Are over 18 years of age.
- Agree to participate in the project.

Participant Name	
Participant Signature	
Date	

Please return this sheet to a Research Team member prior to undertaking the questionnaire.

Page 1 of 1

Consent Form – Focus Group/Interview

University of Southern Queensland

Consent Form for USQ Research Project Interview

Project Details

Title of Project:	Safety Leadership and its Impact on Performance
Human Research Ethics Approval Number:	H17REA128

Research Team Contact Details

Principal Investigator Details

Mr Tim Allred
Email:
Mobile: [redacted]

Supervisor Details

Associate Professor Lee Fergusson
Email:
Mobile: [redacted]

Statement of Consent

By signing below, you are indicating that you:

- Have read and understood the information document regarding this project.
- Have had any questions answered to your satisfaction.
- Understand that if you have any additional questions you can contact the research team.
- Understand that the interview will be audio recorded. If you wish to participate without the interview being audio recorded, please initial here ___.
- Understand that you will be provided with a copy of the transcript of the interview for my perusal and endorsement prior to inclusion of this data in the project.
- Understand that you are free to withdraw at any time, without comment or penalty.
- Understand that you can contact the University of Southern Queensland Ethics Coordinator on (07) 4631 2690 or email ethics@usq.edu.au if you do have any concern or complaint about the ethical conduct of this project.
- Are over 18 years of age.
- Agree to participate in the project.

Participant Name	
Participant Signature	
Date	

Please return this sheet to a Research Team member prior to undertaking the interview.

Page **1** of **1**

Appendix C

Questionnaire Email Communications

Invitation to Complete Survey

SUBJECT: PFM Safety Survey - Inviting Your Feedback

Dear //FirstName,

Programmed FM VIC/TAS is participating in a Safety Leadership survey as part of a doctoral research being undertaken by Tim Allred, Regional HSEQ Manager (VIC/TAS). This project is being completed through the University of Southern Queensland.

The survey aims to measure the perception of safety leadership within PFM, over a 12 month period, and whether there is a relationship between safety leadership and organisational performance.

You are invited to complete this online survey using to below link, before Saturday 30 September.

Your feedback will contribute to the improvement of Programmed's safety culture and practices both within our organisation and how we work with our customers. This is an important opportunity for you to have your say, and should only take 20 minutes to complete.

Follow this link to the Survey: //SurveyLink?d=Take the Survey Now

Or copy and paste the URL below into your internet browser:
//SurveyURL

This research has received ethics approval. Your completed survey will be confidential and anonymous and you do not need to place your name on the survey. Your responses will not be individually identifiable and only aggregated information on groups of employees will be made available.

If you have any questions about this research project, please contact Tim Allred on [redacted] or [redacted]

Thank you in advance for your participation in this project.

Tim Allred
Regional HSEQ Manager (VIC/TAS)
[redacted]

Follow the link to opt out of future emails:
//OptOutLink?d=Click here to unsubscribe

First Reminder Email

SUBJECT: PFM Safety Survey - Awaiting Your Feedback

Dear //FirstName

Last week you should have received an invitation to participate in a Safety Leadership survey which is being conducted at Programmed FM, as part of a research project I am undertaking with the University of Southern Queensland.

The central purpose of the survey is to measure the perception of safety leadership within PFM and whether there is a relationship between safety leadership and organisational performance. We are aiming to understand the perception of how safety is managed across the business as well as to gain an understanding of how safety leadership is demonstrated. Your feedback will contribute to the improvement of Programmed's safety culture and practices both within our organisation and how we work with our customers. This is an important opportunity for you to have your say.

The survey is anonymous, so you do not need to place your name on this survey. We are collecting demographic information including age, role type and years of service; however we will ensure that no individual is identified and all responses are treated confidentially. All reporting will be on de-identified data at the aggregate level only. This means that groups under ten will not be separately reported.

If you have already completed the survey and responded, thank you very much for your time and assistance.

If you have yet to respond, there is still time to complete the survey and contribute your valuable feedback.

Follow this link to the Survey: //SurveyLink?d=Take the Survey Now

Or copy and paste the URL below into your internet browser:
//SurveyURL

I encourage you to complete the survey and have your say, before the survey closes on Friday 30 September.

Tim Allred
Regional HSEQ Manager (VIC/TAS)
[redacted]

Follow the link to opt out of future emails:
//OptOutLink?d=Click here to unsubscribe

Second Reminder Email

SUBJECT: //FirstName, there's 10 days left to complete the PFM Safety Survey

Dear //FirstName

There's 10 days left to complete the Safety Leadership survey which is being conducted at Programmed FM, as part of a research project I am undertaking with the University of Southern Queensland.

The survey is anonymous, so you do not need to place your name on this survey. We are collecting demographic information including age, role type and years of service; however we will ensure that no individual is identified and all responses are treated confidentially. All reporting will be on de-identified data at the aggregate level only. This means that groups under ten will not be separately reported.

If you have already completed the survey and responded, thank you very much for your time and assistance.

If you have yet to respond, there is still time to complete the survey and contribute your valuable feedback.

Follow this link to the Survey: //SurveyLink?d=Take the Survey Now

Or copy and paste the URL below into your internet browser:
//SurveyURL

I encourage you to complete the survey and have your say, before the survey closes on Friday 30 September.

Tim Allred
Regional HSEQ Manager (VIC/TAS)
[redacted]

Follow the link to opt out of future emails:
//OptOutLink?d=Click here to unsubscribe

Final Reminder Email

SUBJECT: //FirstName, this is your last chance to complete the PFM Safety Survey

Dear //FirstName

This is the last week to complete the Safety Leadership survey which is being conducted at Programmed FM, as part of a research project I am undertaking with the University of Southern Queensland.

If you have already completed the survey and responded, thank you very much for your time and assistance.

If you have yet to respond (or started but not finished yet), there is still time to complete the survey and contribute your valuable feedback.

Follow this link to the Survey: //SurveyLink?d=Take the Survey Now

Or copy and paste the URL below into your internet browser:
//SurveyURL

I encourage you to complete the survey and have your say, before the survey closes on Friday 30 September.

Tim Allred
Regional HSEQ Manager (VIC/TAS)
[redacted]

Follow the link to opt out of future emails:
//OptOutLink?d=Click here to unsubscribe

Appendix D

Survey Questionnaire

The below was transcribed into Qualtrics for electronic distribution to respondents.

University of Southern Queensland

PFM Safety Leadership Survey

Introduction

This survey is being undertaken as part of a Doctoral Project at the University of Southern Queensland (USQ).

The purpose of this project is to measure the perception of safety leadership within Programmed Facility Management (PFM), and whether there is a relationship between safety leadership and organisational performance.

The research team requests your assistance to understand the perception of how safety is managed across the business as well as to gain an understanding of how safety leadership is demonstrated.

Project Details

Title of Project:	Safety Leadership and its Impact on Performance
Human Research Ethics Approval Number:	H17REA128

Research Team Contact Details

Principal Investigator Details

Mr Tim Allred
Email:
Mobile: [redacted]

Supervisor Details

Associate Professor Lee Fergusson
Email:
Mobile: [redacted]

Structure of the Survey Tool

Section 1 - Demographic Information
Section 2 - Safety Perceptions
Section 3 - Leadership Perceptions
Section 4 - Areas for Improvement (optional)

Participant Information and Consent Form

Please read the enclosed Participant Information form, detailing the project being undertaken, expected risks and benefits, privacy and confidentiality information.

All participants are asked to read, sign and return the provided Consent Form to indicate consent to participate in this project.

Page **1** of **6**

Section 1 – Demographic Information

The following questions will be used to understand the demographics of the survey respondents.
Please select only one item for each question.

To which gender identity do you most identify?

- ☐ Male
- ☐ Female
- ☐ Prefer not to answer

How is your current role best described?

- ☐ Trades / Labour
- ☐ Salaried / Administration

What is your employment status?

- ☐ Full Time
- ☐ Part Time
- ☐ Casual / Contract

Do you have a managerial (people leadership) position?

- ☐ Yes – if so, what best describes your position?
  - ☐ Executive Manager
  - ☐ Contract / Regional Manager
  - ☐ Operational / Functional Manager
  - ☐ Coordinator / Supervisor
- ☐ No

What contract / business group do you work in?

- ☐ City of Casey
- ☐ City West Water
- ☐ Dulux Clayton
- ☐ Energy Australia
- ☐ Hopkins Correctional Centre
- ☐ Housing Morwell
- ☐ Housing Warrnambool
- ☐ Orica Deer Park
- ☐ Victorian Minor Contracts
- ☐ WorkSafe Victoria
- ☐ Yarra Valley Water
- ☐ Other _____

How long have you worked at PFM?

- ☐ Less than 1 year
- ☐ 1-2 years
- ☐ 2-5 years
- ☐ 5-10 years
- ☐ More than 10 years

What is your age?

- ☐ Under 18
- ☐ 18-20
- ☐ 21-30
- ☐ 31-40
- ☐ 41-50
- ☐ 51-60
- ☐ 60+

Section 2 – Safety Perceptions

This section of the survey is broken into two elements, focusing on 1) how managers and supervisors handle safety in the workplace and 2) how employees handle safety.

For each, please respond to the set of statements, rating it from Strongly Disagree (1) to Strongly Agree (4).

Although some questions may appear very similar, please answer each one of them.

Managers and Supervisors
In the following section please describe how you perceive that the managers and supervisors at this workplace handle safety.

	Strongly disagree (1)	Disagree	Agree	Strongly agree (4)
Management encourages employees here to work in accordance with safety rules - even when the work schedule is tight	☐	☐	☐	☐
Management ensures that everyone receives the necessary information on safety	☐	☐	☐	☐
Management looks the other way when someone is careless with safety	☐	☐	☐	☐
Management places safety before production	☐	☐	☐	☐
Management accepts employees here taking risks when the work schedule is tight	☐	☐	☐	☐
We who work here have confidence in the management's ability to handle safety	☐	☐	☐	☐
Management ensures that safety problems discovered during safety conversations / audits / inspections are corrected immediately	☐	☐	☐	☐
When a risk is detected, management ignores it without action	☐	☐	☐	☐
Management lacks the ability to handle safety properly	☐	☐	☐	☐
Management strives to design safety routines that are meaningful and actually work	☐	☐	☐	☐
Management makes sure that each and everyone can influence safety in their work	☐	☐	☐	☐
Management encourages employees here to participate in decisions which affect their safety	☐	☐	☐	☐
Management never considers employees' suggestions regarding safety	☐	☐	☐	☐
Management strives for everybody at the worksite to have high competence concerning safety and risks	☐	☐	☐	☐
Management never asks employees for their opinions before making decisions regarding safety	☐	☐	☐	☐
Management involves employees in decisions regarding safety	☐	☐	☐	☐
Management collects accurate information in accident investigations	☐	☐	☐	☐
Fear of sanctions (negative consequences) from management discourages employees here from reporting near-miss accidents	☐	☐	☐	☐
Management listens carefully to all who have been involved in an accident event	☐	☐	☐	☐
Management looks for causes, not guilty persons, when an accident occurs	☐	☐	☐	☐
Management always blames employees for accidents	☐	☐	☐	☐
Management treats employees involved in an accident fairly	☐	☐	☐	☐

Employees

In the following section please describe how you perceive that employees at this workplace handle safety.

	Strongly disagree (1)	Disagree	Agree	Strongly agree (4)
We who work here try hard together to achieve a high level of safety	☐	☐	☐	☐
We who work here take joint responsibility to ensure that the workplace is always kept tidy	☐	☐	☐	☐
We who work here do not care about each others' safety	☐	☐	☐	☐
We who work here avoid tackling risks that are discovered	☐	☐	☐	☐
We who work here help each other to work safely	☐	☐	☐	☐
We who work here take no responsibility for each others' safety	☐	☐	☐	☐
We who work here regard risks as unavoidable	☐	☐	☐	☐
We who work here consider minor accidents as a normal part of our daily work	☐	☐	☐	☐
We who work here accept dangerous behaviour as long as there are no accidents	☐	☐	☐	☐
We who work here break safety rules in order to complete work on time	☐	☐	☐	☐
We who work here never accept risk-taking even if the work schedule is tight	☐	☐	☐	☐
We who work here consider that our work is unsuitable for cowards	☐	☐	☐	☐
We who work here accept risk-taking at work	☐	☐	☐	☐
We who work here try to find a solution if someone points out a safety problem	☐	☐	☐	☐
We who work here feel safe when working together	☐	☐	☐	☐
We who work here have great trust in each others' ability to ensure safety	☐	☐	☐	☐
We who work here learn from our experiences to prevent accidents	☐	☐	☐	☐
We who work here take each others' opinions and suggestions concerning safety seriously	☐	☐	☐	☐
We who work here seldom talk about safety	☐	☐	☐	☐
We who work here always discuss safety issues when such issues come up	☐	☐	☐	☐
We who work here can talk freely and openly about safety	☐	☐	☐	☐
We who work here consider that a good safety representative plays an important role in preventing accidents	☐	☐	☐	☐
We who work here consider that safety conversations /audits / inspections have no effect on safety	☐	☐	☐	☐
We who work here consider that safety training is good for preventing accidents	☐	☐	☐	☐
We who work here consider early planning for safety as meaningless	☐	☐	☐	☐
We who work here consider that safety conversations / audits / inspections help find serious hazards	☐	☐	☐	☐
We who work here consider that safety training is meaningless	☐	☐	☐	☐
We who work here consider that it is important that there are clear-cut goals for safety	☐	☐	☐	☐

Section 3 – Leadership Perceptions

This section of the survey focuses on perceptions of leadership within the workplace.

For each of the following set of statements, please rate your response from Strongly Disagree (1) to Strongly Agree (5).

My Manager's Leadership
Please respond to the following set of statements, in relation to your line manager's leadership.

	Strongly disagree (1)	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree (5)
My leader clearly states what he/she means.	☐	☐	☐	☐	☐
My leader shows consistency between his/her beliefs and actions.	☐	☐	☐	☐	☐
My leader asks for ideas that challenge his/her core beliefs.	☐	☐	☐	☐	☐
My leader describes accurately the way that others view his/her abilities.	☐	☐	☐	☐	☐
My leader uses his/her core beliefs to make decisions.	☐	☐	☐	☐	☐
My leader carefully listens to alternative perspectives before reaching a conclusion.	☐	☐	☐	☐	☐
My leader shows that he/she understands his/her strengths and weaknesses.	☐	☐	☐	☐	☐
My leader openly shares information with others.	☐	☐	☐	☐	☐
My leader resists pressures on him/her to do things contrary to his/her beliefs.	☐	☐	☐	☐	☐
My leader objectively analyzes relevant data before making a decision.	☐	☐	☐	☐	☐
My leader is clearly aware of the impact he/she has on others.	☐	☐	☐	☐	☐
My leader expresses his/her ideas and thoughts clearly to others.	☐	☐	☐	☐	☐
My leader is guided in his/her actions by internal moral standards.	☐	☐	☐	☐	☐
My leader encourages others to voice opposing points of view.	☐	☐	☐	☐	☐

Section 4 – Areas for Improvement (optional)

The following questions are optional; however, your responses would provide valuable insights into how we can improve safety in our workplaces across PFM.

What do you think needs to be done to improve safety?

How do you think the next serious injury could occur?

What could be done to prevent this from happening?

Thank you for taking the time to help with this research project.

Appendix E

Human Ethics Research Approval

OFFICE OF RESEARCH
Human Research Ethics Committee
PHONE +61 7 4687 5703| FAX +61 7 4631 5555
EMAIL human.ethics@usq.edu.au

UNIVERSITY OF SOUTHERN QUEENSLAND

22 June 2017

Mr Timothy Allred

Dear Timothy

The USQ Human Research Ethics Committee has recently reviewed your responses to the conditions placed upon the ethical approval for the project outlined below. Your proposal is now deemed to meet the requirements of the *National Statement on Ethical Conduct in Human Research (2007)* and full ethical approval has been granted.

Approval No.	**H17REA128**
Project Title	Safety leadership and its impact on performance
Approval date	22 June 2017
Expiry date	22 June 2020
HREC Decision	**Approved**

The standard conditions of this approval are:

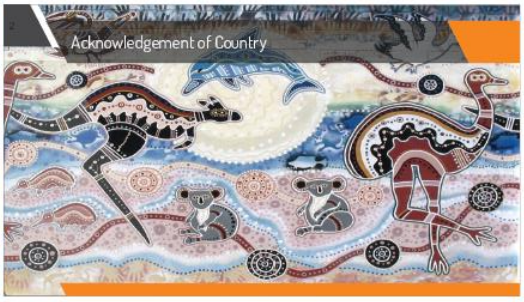
(a) Conduct the project strictly in accordance with the proposal submitted and granted ethics approval, including any amendments made to the proposal required by the HREC
(b) Advise (email: human.ethics@usq.edu.au) immediately of any complaints or other issues in relation to the project which may warrant review of the ethical approval of the project
(c) Make submission for approval of amendments to the approved project before implementing such changes
(d) Provide a 'progress report' for every year of approval
(e) Provide a 'final report' when the project is complete
(f) Advise in writing if the project has been discontinued, using a 'final report'

For (c) to (f) forms are available on the USQ ethics website:
http://www.usq.edu.au/research/support-development/research-services/research-integrity-ethics/human/forms

[redacted]
Samantha Davis
Ethics Officer

Appendix F

Authentic Safety Leadership Workshop Presentation



Drivers of Organisational Performance

gnireenignE

- Performance influenced by culture
- Culture influenced by leadership

Can we improve organisational performance through safety leadership?

Organisational performance

Project will look broadly at organisational performance, taking into consideration:

- Finance – Profit and Loss, Cashflow
- HR – Employee Attachment / Retention, Engagement
- Sales – Net Promotor Score
- Safety – LTIFR, TRIFR, Safety Conversations, Safety Climate

Culture iceberg

What we see

What we say

What we believe

Culture iceberg

Behaviours, systems, processes, policies

Ideals, goals, values, aspirations

Underlying assumptions

Safety climate survey

- Safety climate surveys are a 'pulse check' of the safety culture
- Kines *et al.* developed a safety climate survey (NOSACQ-50) which provides an in-depth perspective on 7 dimensions of an organisation's safety climate

13

Dimensions of safety climate

1. Management safety priority and ability
2. Management safety empowerment
3. Management safety justice
4. Worker safety commitment
5. Worker's safety priority and risk non-acceptance
6. Peer safety communication, learning and trust in safety ability
7. Worker's trust in the efficacy of safety systems

14

Leadership as a driver of culture

- Leaders have the greatest ability to influence on the culture of their teams
- Leaders play a critical role in using their behaviour by setting the tone for what's acceptable
- Will have a positive / negative impact on the underlying assumptions held by staff

15

2. Survey Results

A brief look at the current perceptions of staff

16

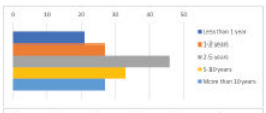
Summary and demographics

- 47.98% Response Rate – 154 (of 321)
  - Completion rate of 86.03% (25 unfinished surveys)
- 23% Female / 74% Male
- 27% Trades / Labour roles
- 94% Full Time / 6% Part Time or Casual
- 49% in People Leadership Roles
  - Manager / Contract / Operational / Coordinator / Supervisor

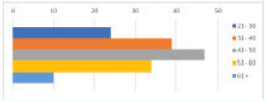
17

Summary and demographics

- Length of Service



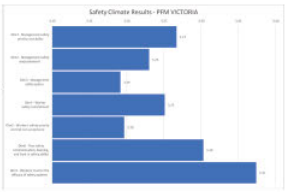
- Age



18

Safety climate

- NOSACQ-50 Survey Tool
- 4 point Likert Scale
- 7 Dimensions of Safety Climate across Management and Peer Group
- 83.07% positive safety climate rating



19

Key areas requiring focus – safety climate

- Management Safety Justice
  - Accurate information is not collected in accident investigations
  - Employees don't report near-miss accidents for fear of sanctions
  - Employees don't feel listened to when involved in an accident
  - Management looks for guilty persons, not causes, when an accident occurs
  - Employees are always blamed for accidents
  - Employees who are involved in accidents are not treated fairly

20

Key areas requiring focus – safety climate

- Management Safety Empowerment
  - Safety routines are not meaningful and don't work
  - Employees don't feel that everyone can influence safety at work
  - Management doesn't encourage employees to participate in decisions affecting their safety
  - Management never considers employees' suggestions regarding safety
  - Management doesn't ensure high levels of employee competence when it comes to safety and risk
  - Employees opinions are not sought before decisions are made
  - Employees are not involved in decisions regarding safety

21

Key areas requiring focus – safety climate

- Workers' Safety Priority and Risk Non-Acceptance
  - Employees regard risks as unavoidable
  - Employees consider minor accidents as a normal part of work
  - Employees accept dangerous behaviour as long as there are no accidents
  - Employees break safety rules in order to complete work on time
  - Employees accept risk-taking behaviour especially when the work schedule is tight
  - Employees consider that the work is unsuitable for cowards
  - Employees accept risk-taking at work

22

Authentic leadership

- Authentic Leadership Inventory
- 5 point Likert Scale
- 4 Dimensions of Authenticity
- 79% positive rating of leader's authenticity

23

3.
Leading to Change Culture

Improving performance through culture

24

Culture » to Care

from the Latin, *cultus*

25

How do we hacking the culture code

26

ACTIVITY 2

Fear in a Hat

27

GOOD LEADERS MAKE YOU FEEL SAFE

"When a leader makes the choice to put the safety and lives of the people inside the organization first... remarkable things happen."

Simon Sinek

28

Start with Safety

- Safety is the foundation on which a strong culture is built
- It's about sending super-clear, continuous signals
  - We share a future / We have a voice
- Everyone feels connected and engaged to something bigger

29

Get Vulnerable

- Strong cultures make a habit of sharing their weakness / failure, so they can improve together
- Vulnerability turns connection into trusting cooperation

30

Share Stories

- Stories guide group behaviour
- Stories create links between the present moment and a future ideal

31

GAS Principle

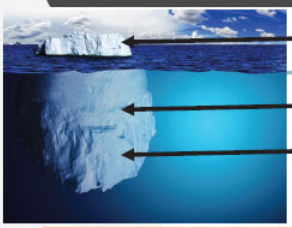
32

4.
Safety Leadership

It's not *really* about safety

33

Leadership iceberg



Leading Others

Self Leadership

Self Awareness

34

Authentic leadership – what is it?

- An ongoing process
- Underpinned by four factors
  - Self-awareness
  - Internalised moral perspective
  - Balanced processing of information
  - Relational transparency

35

Self awareness

- Refers to the leaders' cognisance of, and trust in, their values, motivations, feelings, and thoughts
- Leaders who have a higher awareness of self will be
  - More self-accepting
  - Have a higher level of autonomy
  - Have more positive relationships with others

36

Internalised moral perspective

- Refers to whether the leader act in accordance with their true self, in line with their values, motivations and needs, as opposed to merely trying to please others through acting falsely
- Appear to have more internal motivation for what they do

37

Balanced processing

- Refers to the leaders' ability to process, without denying, distorting, exaggerating or ignoring, their thoughts and knowledge, experiences, and other external information

38

Relational transparency

- Refers to the leader valuing and striving for achieving a sense of transparency in relationships
  - Comes across as truthfulness and openness between the leader and the follower
- Fosters trust between the leader and the follower, supporting more positive relationships

39

Authentic leadership – who is an authentic leader?

- Determined by follower's perceptions
- Confident, hopeful, resilient, high moral character
- Understanding
- Self-aware
- Deep sense of purpose

40

Authentic leadership – organisational leadership

- People are the most important asset
- Employee trust and engagement
- Investing in people
- Building trusting relationships

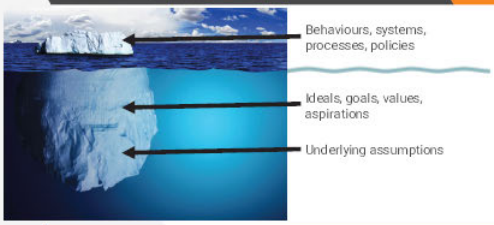
41

Authentic leadership – assisting in change

- Help followers gain awareness of others
- Influences
  - Thinking
  - Motivation
  - Choice of behaviours

42

Culture iceberg



43

5.
Reflecting on Your Safety Leadership

44

How can we lead (safety) authentically?

- As an action out of this workshop, participants are asked to consider what they can do to improve the safety climate results by focusing on authentic safety leadership
  - Start with safety
  - Get vulnerable
  - Share stories

45

- 1-on-1 Follow Up Session within 6mths
  - What did you commit to doing?
  - How are you going in demonstrating your safety leadership?

46

6.
Improving our Team's Performance (and Safety)

After Action Reviews / Appreciative Investigations

47

After Action Reviews – Team Feedback Loops

- An AAR is a simple continuous improvement tool that facilitates learning and knowledge flows within and between organisational members
- Can assist in preventing quality non-conformance, rework and safety issues

48

After Action Reviews – Team Feedback Loops

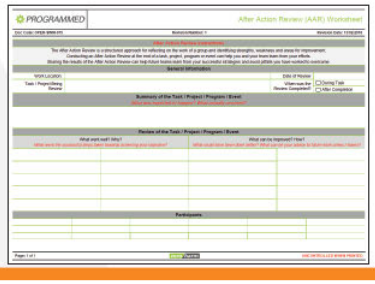
- Regularly used within Military and para-military groups
- AAR are a standing operating procedure following any mission or training exercise.
- AAR provides an opportunity for reflection, learning and improvement

AFTER ACTION REVIEW

The Australian Army conducts an After Action Review at the completion of the tactical phase of Exercise Hamel. A process that allows teams to learn from the activity, ensures adaptability and reinforces success.

After Action Reviews – Team Feedback Loops

- The After Action Review process involves three reflective steps:
  - What was expected to happen? What actually occurred?
  - What were the successful steps taken towards achieving your objective?
  - What could have been done better? What can be your advice to future work crews/teams?



Appreciative Investigations

- Normal incident investigations seek to understand exceptions to normal work
- They assume that something special or unusual must have happened for this unplanned event to occur
- They create recommendations to reduce the likelihood that this will occur again

Appreciative Investigations

- Appreciative investigation searches for the best in people, their organisations, and how they interact with the world
- Involves a systematic discovery of what gives 'life' to a living system when it is most alive

APPRECIATIVE INQUIRY

"Just as plants grow towards the light, organizations grow and develop towards whatever it is which is the life-giving force in the organization."

Professor John Hayes

55

Appreciative Investigations

- Is a deliberate, focused and methodical activity
  - Examines normal work and work as actually and currently done
  - From the point of view of the worker
  - Views variation as something that provides insight
  - Is a collaboration with workers to improve the work environment and practices

56

Appreciative Investigations

- Doesn't seek to uncover 'causes'
- Seeks to identify features that help or hinder work performance
- Explores how aspects such as tools, resources, work methods, work conditions and constrains impact work in various ways

57

Appreciative Investigations

- Appreciating Investigations will be facilitated as part of the project
- Invite suggestions for areas where an Appreciative Investigation may be of value to improve the conditions of work, such as
  - An area that you would like to know more about
  - Where changes have recently occurred
  - An area previously neglected

58

What Next?

A brief look forward...

59

Key activities and timings

Leadership Commitments

Following this workshop, participants are asked to consider what they will commit to focusing on to improve their authentic safety leadership within the business.

How will the key takeaways from this workshop gain penetration throughout your Contracts / Business Units?

1-on-1 Follow Session

By the end of October, Tim will schedule a 1-on-1 follow up session with all participants to review these commitments and discuss how these are being demonstrated within the business.

Safety Climate Survey Results

A summary of the Round 1 Safety Climate Survey Results will be prepared and distributed to the business to provide transparency to those who participated, and communicate that the Implementation Phase of the project is underway to respond to the survey results.

60

Key activities and timings

After Action Reviews

A minimum of 12 AARs will be lead / facilitated by Tim Allred as part of the doctoral project. Conversations with work crews will be undertaken in concert with these facilitated AARs.

Contracts would benefit from implementing AARs within their teams, and are welcome and encouraged to utilise this tool for organisational learning and continuous improvement.

Appreciative Investigations

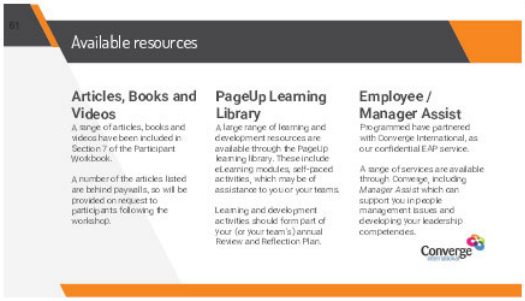
A minimum of 4 Appreciative Investigations will be lead by Tim Allred as part of the doctoral project, with input from key stakeholders throughout this process.

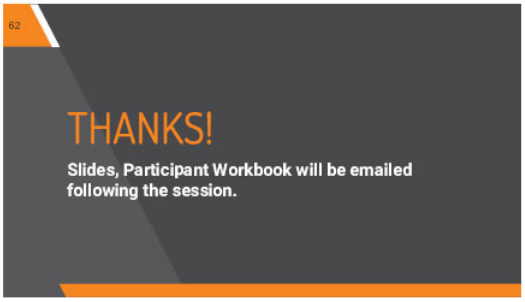
Contract Managers are encouraged to provide suggestions for areas which may benefit from an Appreciative Investigation.

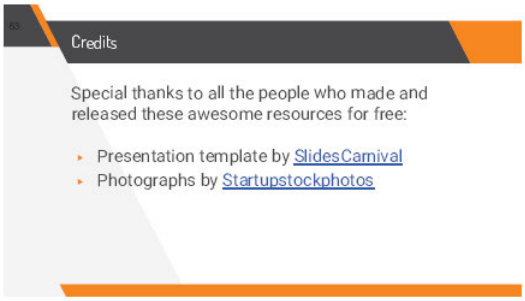
Safety Climate Survey – Round 2

All employees across PFM Victoria will be invited to participate in the second round of the Safety Climate Survey in November 2018.

This data will be compared to the initial survey to determine if any variance is present.


61
Available resources
Articles, Books and Videos
A range of articles, books and videos have been included in Section 7 of the Participant Workbook.
A number of the articles listed are behind paywalls, so will be provided on request to participants following the workshop.
PageUp Learning Library
A large range of learning and development resources are available through the PageUp learning library. These include eLearning modules, self-paced activities, which may be of assistance to you or your teams.
Learning and development activities should form part of your (or your team's) annual Review and Reflection Plan.
Employee / Manager Assist
Programmed have partnered with Converge International, as our confidential EAP service.
A range of services are available through Converge, including Manager Assist which can support you in people management issues and developing your leadership competencies.
Converge

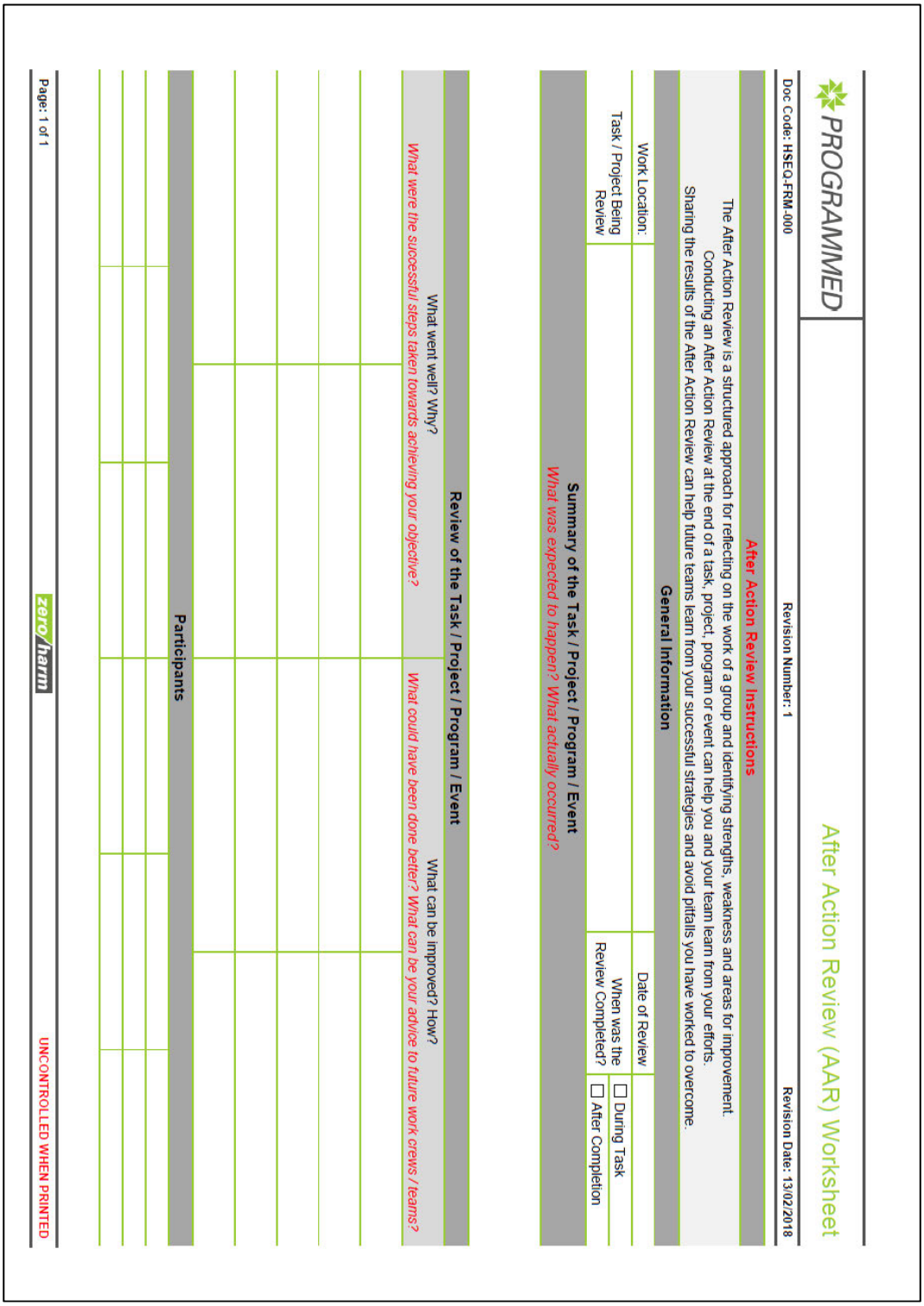

62
THANKS!
Slides, Participant Workbook will be emailed following the session.


63
Credits
Special thanks to all the people who made and released these awesome resources for free:
Presentation template by SlidesCarnival
Photographs by Startupstockphotos

Appendix G

After-Action Review Artefacts

AAR Worksheet



PROGRAMMED

After Action Review (AAR) Worksheet

Doc Code: HSEQ-FRM-000 | Revision Number: 1 | Revision Date: 13/02/2018

After Action Review Instructions

The After Action Review is a structured approach for reflecting on the work of a group and identifying strengths, weakness and areas for improvement.
Conducting an After Action Review at the end of a task, project, program or event can help you and your team learn from your efforts.
Sharing the results of the After Action Review can help future teams learn from your successful strategies and avoid pitfalls you have worked to overcome.

General Information

Work Location:		Date of Review	
Task / Project Being Reviewed		When was the Review Completed?	☐ During Task ☐ After Completion

Summary of the Task / Project / Program / Event

What was expected to happen? What actually occurred?

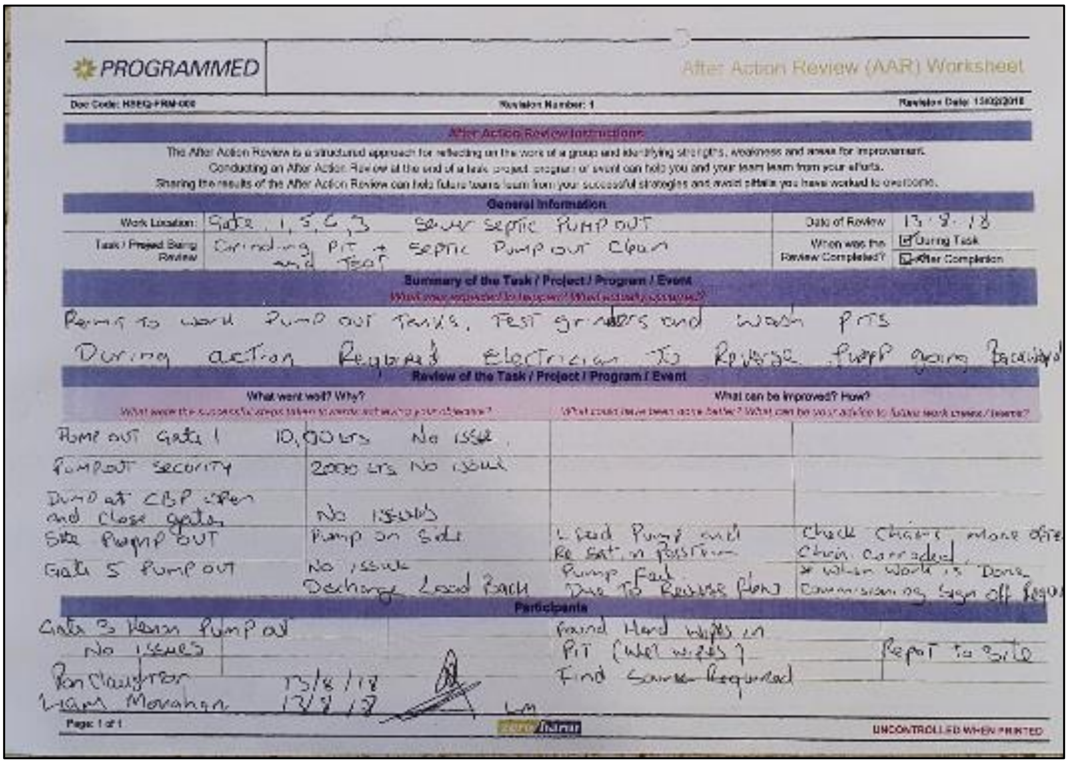
Review of the Task / Project / Program / Event

What went well? Why?	What can be improved? How?
What were the successful steps taken towards achieving your objective?	*What could have been done better? What can be your advice to future work crews / teams?*

Participants

Page: 1 of 1 | zero harm | UNCONTROLLED WHEN PRINTED

Selected Examples of Completed AAR Worksheets



PROGRAMMED | After Action Review (AAR) Worksheet

Doc Code: HSEQ-FRM-000 | Revision Number: 1 | Revision Date: 13/02/2018

After Action Review Instructions

The After Action Review is a structured approach for reflecting on the work of a group and identifying strengths, weakness and areas for improvement.
Conducting an After Action Review at the end of a task, project, program or event can help you and your team learn from your efforts.
Sharing the results of the After Action Review can help future teams learn from your successful strategies and avoid pitfalls you have worked to overcome.

General Information

Work Location: Gate 1, 5, 6, 3 Sewer Septic Pump out | Date of Review: 13.8.18

Task / Project Being Review: Grinding pit + septic pump out clean and test | When was the Review Completed? ☑ During Task ☑ After Completion

Summary of the Task / Project / Program / Event
What was expected to happen? What actually occurred?

Return to work pump out tanks, test grinders and wash pits
During action required electrician to reverse pump going backwards

Review of the Task / Project / Program / Event

What went well? Why?		What can be improved? How?	
Pump out Gate 1	10,000 Lts No issue		
Pump out security	2000 Lts No issue		
Pump at CBP open and close gates	No issues		
Site Pump out	Pump on side	Used pump and re-set in position	Check chains more often. Chain corroded
Gate 5 Pump out	No issue. Discharge load back	Pump fault due to reverse flow	* When work is done commissioning sign off required
Gate 3 Rearm Pump out. No issues		Found hard wipes in pit (wet wipes?) Find source required	Report to site

Participants

Ron Claughton 13/8/18
Liam Monahan 13/8/18

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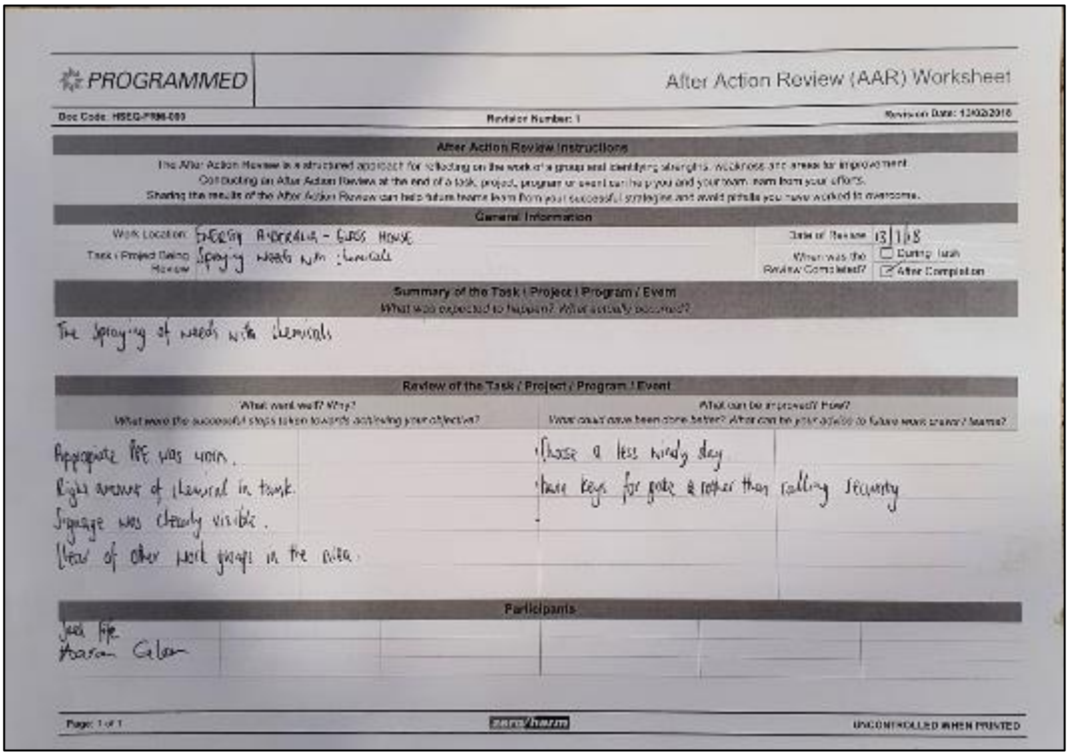

PROGRAMMED | After Action Review (AAR) Worksheet

Doc Code: HSEQ-FRM-000 | Revision Number: 1 | Revision Date: 13/02/2018

After Action Review Instructions

The After Action Review is a structured approach for reflecting on the work of a group and identifying strengths, weakness and areas for improvement.
Conducting an After Action Review at the end of a task, project, program or event can help you and your team learn from your efforts.
Sharing the results of the After Action Review can help future teams learn from your successful strategies and avoid pitfalls you have worked to overcome.

General Information

Work Location: Energy Australia – Glass House | Date of Review: 13/8/18

Task / Project Being Review: Spraying weeds with chemicals | When was the Review Completed? ☐ During Task ☑ After Completion

Summary of the Task / Project / Program / Event
What was expected to happen? What actually occurred?

The spraying of weeds with chemicals

Review of the Task / Project / Program / Event

What went well? Why?	What can be improved? How?
Appropriate PPE was worn.	Choose a less windy day
Right amount of chemical in tank.	Have keys for gate & rather than calling security
Signage was clearly visible.	
Clear of other work groups in the area.	

Participants

Jack Fife
Aaron Glen

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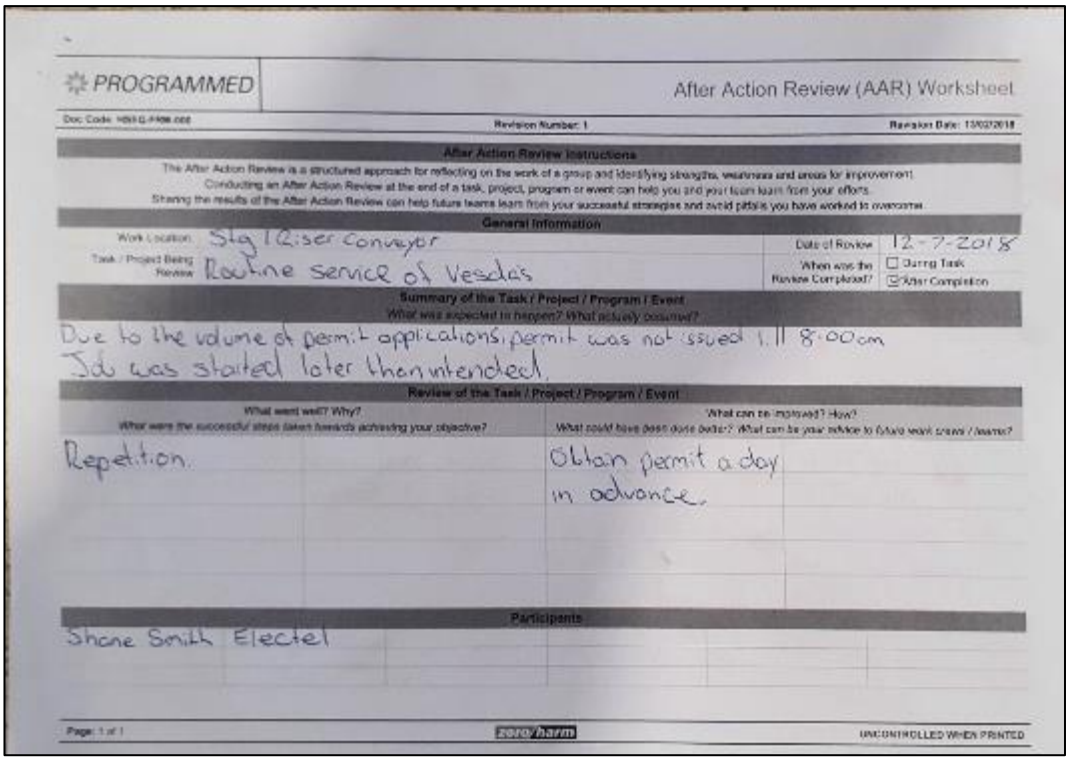


PROGRAMMED

After Action Review (AAR) Worksheet

Doc Code: HSEQ-FRM-008 | Revision Number: 1 | Revision Date: 13/02/2018

After Action Review Instructions

The After Action Review is a structured approach for reflecting on the work of a group and identifying strengths, weaknesses and areas for improvement.
Conducting an After Action Review at the end of a task, project, program or event can help you and your team learn from your efforts.
Sharing the results of the After Action Review can help future teams learn from your successful strategies and avoid pitfalls you have worked to overcome.

General Information

Work Location: Stg 1 Riser conveyor
Task / Project Being Review: Routine service of Vessels
Date of Review: 12-7-2018
When was the Review Completed? ☐ During Task ☑ After Completion

Summary of the Task / Project / Program / Event
What was expected to happen? What actually occurred?

Due to the volume of permit applications, permit was not issued 1.11 8:00am
Job was started later than intended.

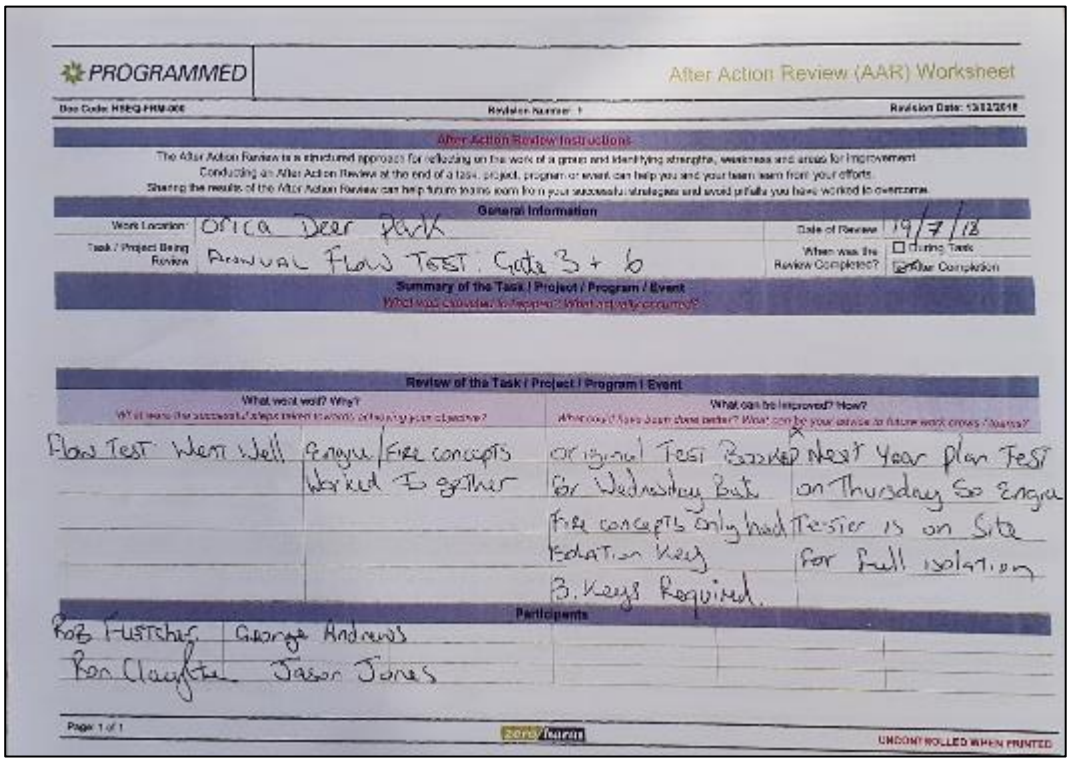
Review of the Task / Project / Program / Event

What went well? Why? What were the successful steps taken towards achieving your objective?	What can be improved? How? What could have been done better? What can be your advice to future work crews / teams?
Repetition.	Obtain permit a day in advance.

Participants

Shane Smith Electel

Page: 1 of 1 | zero harm | UNCONTROLLED WHEN PRINTED



PROGRAMMED

After Action Review (AAR) Worksheet

Doc Code: HSEQ-FRM-008 | Revision Number: 1 | Revision Date: 13/02/2018

After Action Review Instructions

The After Action Review is a structured approach for reflecting on the work of a group and identifying strengths, weaknesses and areas for improvement.
Conducting an After Action Review at the end of a task, project, program or event can help you and your team learn from your efforts.
Sharing the results of the After Action Review can help future teams learn from your successful strategies and avoid pitfalls you have worked to overcome.

General Information

Work Location: Orica Deer Park
Task / Project Being Review: Annual Flow Test. Units 3 + 6
Date of Review: 19/7/18
When was the Review Completed? ☐ During Task ☑ After Completion

Summary of the Task / Project / Program / Event
What was expected to happen? What actually occurred?

Review of the Task / Project / Program / Event

What went well? Why? What were the successful steps taken towards achieving your objective?	What can be improved? How? What could have been done better? What can be your advice to future work crews / teams?
Flow Test went well Engrs/Fire concepts worked together	original Test booked Next Year plan Test for Wednesday but on Thursday so Engrs Fire concepts only had Tester is on Site Isolation Keys for full isolation 3. Keys Required.

Participants

Rob Fletcher | George Andrews
Ron Clayton | Jason Jones

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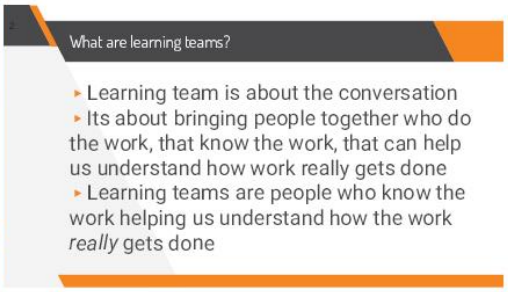
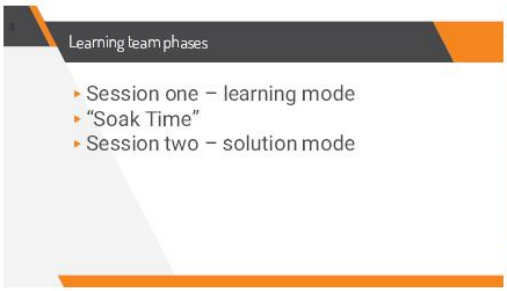
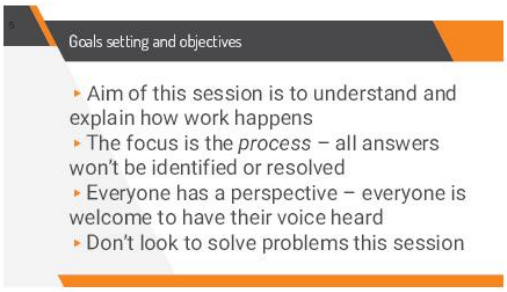
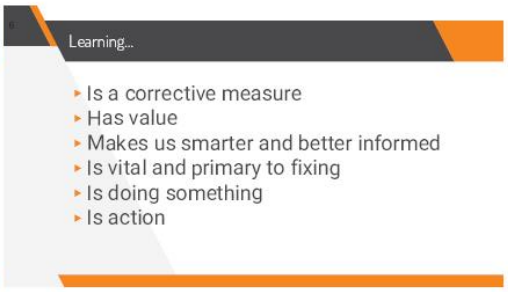
Appendix H

Learning Team Presentation









7

Let's discover:

How we support employee health and wellbeing across the business

8

Let's discover:

How new contracts are mobilised and setup

9

Time to think

- The learning process is complicated and messy
- Allowing time to reflect allows better analysis and problem identification
- "Soak time" allows for deeper understanding

10

Session two: solution mode

- Shift from discovery to problem solution
- Review, recap, and capture additional learning information
- Identify what's important (or not) and why
- Give meaning and importance to the data
- Space for idea generation, where thoughts become actions

11

Let's "soak" on what we've discovered!

12

Session Two

Learning Team: Solution Mode

13

Objectives

- Review and recap learnings from previous session, and capture additional information following "soak time"
- Make sense of the information gathered
- Create space for idea generation and identify actions for improvement for making the workplace better

14

Start in Learning Mode

Review, Recap and Capture Additional Information

15

Moving to Solutions

Review, Recap and Capture Additional Information

16

Solutions

- Knowing what works (and why) is important to knowing what to fix / change
- What small changes can we start now?
- How can we share this across the business?

17

Summary

Better learning = safer and more reliable

18

Better learning

- Great organisations are constantly monitoring what is happening – not waiting for something to happen
- Gives capacity to solve problems early
- Our people have the knowledge and skills to identify these issues and the solutions
- We don't have to change *everything*

19

THANKS!

Slides, Participant Workbook will be emailed following the session.

20

Credits

Special thanks to all the people who made and released these awesome resources for free:

- Presentation template by SlidesCarnival
- Photographs by Startupstockphotos

Appendix I

SPSS Outputs – Exploratory Factor Analysis

Pre-Intervention Exploratory Factor Analysis

NOSACQ-50 EFA - Initial Extraction

```
FACTOR
 /VARIABLES SC1.1 SC1.2 SC1.3_r SC1.4 SC1.5_r SC1.6 SC1.7 SC1.8_r SC1.9_r SC2.1 SC2.2 SC2.3
   SC2.4_r SC2.5 SC2.6_r SC2.7 SC3.1 SC3.2_r SC3.3 SC3.4 SC3.5_r SC3.6 SC4.1 SC4.2 SC4.3_r SC4.4_r
   SC4.5 SC4.6_r SC5.1_r SC5.2_r SC5 3_r SC5.4_r SC5.5 SC5.6_r SC5.7_r SC6.1 SC6.2 SC6.3 SC6.4 SC6.5
   SC6.6_r SC6.7 SC6.8 SC7.1 SC7.2_r SC7.3 SC7.4_r SC7.5 SC7.6_r SC7.7
 /MISSING LISTWISE
 /ANALYSIS SC1.1 SC1.2 SC1.3_r SC1.4 SC1.5_r SC1.6 SC1.7 SC1.8_r SC1.9_r SC2.1 SC2.2 SC2.3 SC2.4_r
   SC2.5 SC2.6_r SC2.7 SC3.1 SC3.2_r SC3.3 SC3.4 SC3.5_r SC3.6 SC4.1 SC4.2 SC4.3_r SC4.4_r SC4.5
   SC4.6_r SC5.1_r SC5.2_r SC5.3_r SC5.4_r SC5.5 SC5.6_r SC5.7_r SC6.1 SC6.2 SC6.3 SC6.4 SC6.5 SC6.6_r
   SC6.7 SC6.8 SC7.1 SC7.2_r SC7.3 SC7.4_r SC7.5 SC7.6_r SC7.7
 /PRINT INITIAL KMO EXTRACTION ROTATION
 /CRITERIA MINEIGEN(1) ITERATE(200)
 /EXTRACTION ML
 /CRITERIA ITERATE(200)
 /ROTATION VARIMAX.
```

Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.926
Bartlett's Test of Sphericity	Approx. Chi-Square	5973.888
	df	1225
	Sig.	.000

Communalities[a]

	Initial
Management encourages employees here to work in accordance with safety rules - even when the work schedule is tight	.761
Management ensures that everyone receives the necessary information on safety	.712
Management looks the other way when someone is careless with safety	.623
Management places safety before production	.519
Management accepts employees here taking risks when the work schedule is tight	.598

We who work here have confidence in the management's ability to handle safety	.806
Management ensures that safety problems discovered during safety conversations / audits / inspections are corrected immediately	.677
When a risk is detected, management ignores it without action	.837
Management lacks the ability to handle safety properly	.834
Management strives to design safety routines that are meaningful and actually work	.736
Management makes sure that each and everyone can influence safety in their work	.819
Management encourages employees here to participate in decisions which affect their safety	.642
Management never considers employees' suggestions regarding safety suggestions regarding safety	.695
Management strives for everybody at the worksite to have high competence concerning safety and risks	.734
Management never asks employees for their opinions before making decisions regarding safety	.752
Management involves employees in decisions regarding safety regarding safety	.691
Management collects accurate information in accident investigations	.811
Fear of sanctions (negative consequences) from management discourages employees here from reporting near-miss accidents	.651

Management listens carefully to all who have been involved in an accident event	.853
Management looks for causes, not guilty persons, when an accident occurs	.687
Management always blames employees for accidents	.688
Management treats employees involved in an accident fairly	.730
We who work here try hard together to achieve a high level of safety	.764
We who work here take joint responsibility to ensure that the workplace is always kept tidy	.658
We who work here do not care about each others' safety	.690
We who work here avoid tackling risks that are discovered	.481
We who work here help each other to work safely	.813
We who work here take no responsibility for each others' safety	.711
We who work here regard risks as unavoidable	.565
We who work here consider minor accidents as a normal part of our daily work	.616
We who work here accept dangerous behaviour as long as there are no accidents	.726
We who work here break safety rules in order to complete work on time	.686
We who work here never accept risk-taking even if the work schedule is tight	.445
We who work here consider that our work is unsuitable for cowards	.543
We who work here accept risk-taking at work	.591

We who work here try to find a solution if someone points out a safety problem	.718
We who work here feel safe when working together	.806
We who work here have great trust in each others' ability to ensure safety	.849
We who work here learn from our experiences to prevent accidents	.834
We who work here take each others' opinions and suggestions concerning safety seriously	.847
We who work here seldom talk about safety	.475
We who work here always discuss safety issues when such issues come up	.702
We who work here can talk freely and openly about safety	.820
We who work here consider that a good safety representative plays an important role in preventing accidents	.657
We who work here consider that safety conversations /audits / inspections have no effect on safety	.661
We who work here consider that safety training is good for preventing accidents	.666
We who work here consider early planning for safety as meaningless	.743
We who work here consider that safety conversations / audits / inspections help find serious hazards	.711
We who work here consider that safety training is meaningless	.781
We who work here consider that it is important that there are clear-cut goals for safety	.738

Extraction Method: Maximum Likelihood.[a]

a. One or more communalitiy estimates greater than 1 were encountered during iterations. The resulting solution should be interpreted with caution.

Total Variance Explained

	Initial Eigenvalues		
Factor	Total	% of Variance	Cumulative %
1	20.713	41.426	41.426
2	3.366	6.732	48.158
3	2.914	5.829	53.987
4	1.625	3.250	57.237
5	1.407	2.813	60.050
6	1.356	2.712	62.762
7	1.159	2.318	65.080
8	1.093	2.186	67.267
9	1.001	2.001	69.268
10	.936	1.872	71.140
11	.876	1.752	72.892
12	.814	1.629	74.520
13	.791	1.583	76.103
14	.721	1.442	77.545
15	.704	1.409	78.954
16	.659	1.318	80.273
17	.656	1.313	81.586
18	.590	1.180	82.766
19	.572	1.143	83.909
20	.538	1.077	84.986
21	.522	1.044	86.030
22	.497	.995	87.024
23	.466	.932	87.957
24	.430	.861	88.818
25	.413	.826	89.644
26	.395	.789	90.433
27	.358	.715	91.148
28	.338	.676	91.824
29	.320	.640	92.464
30	.304	.607	93.071
31	.299	.598	93.670
32	.278	.556	94.225

33	.271	.542	94.767
34	.264	.527	95.294
35	.242	.485	95.779
36	.232	.464	96.243
37	.226	.452	96.695
38	.211	.423	97.118
39	.184	.368	97.485
40	.159	.319	97.804
41	.158	.316	98.120
42	.145	.290	98.410
43	.136	.273	98.683
44	.118	.237	98.919
45	.117	.233	99.153
46	.106	.212	99.365
47	.095	.191	99.556
48	.088	.175	99.731
49	.069	.138	99.870
50	.065	.130	100.000

Extraction Method: Maximum Likelihood.

Factor Matrix[a]

a. Attempted to extract 9 factors. In iteration 200, no local minimum was found. Extraction was terminated.

Maximum Likelihood failed to extract factors. Initial extraction reattempted Principal Components

```
FACTOR
 /VARIABLES SC1.1 SC1.2 SC1.3_r SC1.4 SC1.5_r SC1.6 SC1.7 SC1.8_r SC1.9_r SC2.1 SC2.2 SC2.3
   SC2.4_r SC2.5 SC2.6_r SC2.7 SC3.1 SC3.2_r SC3.3 SC3.4 SC3.5_r SC3.6 SC4.1 SC4.2 SC4.3_r SC4.4_r
   SC4.5 SC4.6_r SC5.1_r SC5.2_r SC5 3_r SC5.4_r SC5.5 SC5.6_r SC5.7_r SC6.1 SC6.2 SC6.3 SC6.4 SC6.5
   SC6.6_r SC6.7 SC6.8 SC7.1 SC7.2_r SC7.3 SC7.4_r SC7.5 SC7.6_r SC7.7
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   SC6.7 SC6.8 SC7.1 SC7.2_r SC7.3 SC7.4_r SC7.5 SC7.6_r SC7.7
 /PRINT INITIAL KMO EXTRACTION ROTATION
 /CRITERIA MINEIGEN(1) ITERATE(200)
 /EXTRACTION PC
 /CRITERIA ITERATE(200)
 /ROTATION VARIMAX
 /METHOD=CORRELATION.
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Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.926
Bartlett's Test of Sphericity	Approx. Chi-Square	5973.888
	df	1225
	Sig.	.000

Communalities

	Initial	Extraction
Management encourages employees here to work in accordance with safety rules - even when the work schedule is tight	1.000	.695
Management ensures that everyone receives the necessary information on safety	1.000	.618
Management looks the other way when someone is careless with safety	1.000	.629
Management places safety before production	1.000	.678
Management accepts employees here taking risks when the work schedule is tight	1.000	.619

We who work here have confidence in the management's ability to handle safety	1.000	.766
Management ensures that safety problems discovered during safety conversations / audits / inspections are corrected immediately	1.000	.639
When a risk is detected, management ignores it without action	1.000	.765
Management lacks the ability to handle safety properly	1.000	.785
Management strives to design safety routines that are meaningful and actually work	1.000	.656
Management makes sure that each and everyone can influence safety in their work	1.000	.759
Management encourages employees here to participate in decisions which affect their safety	1.000	.686
Management never considers employees' suggestions regarding safety suggestions regarding safety	1.000	.679
Management strives for everybody at the worksite to have high competence concerning safety and risks	1.000	.685
Management never asks employees for their opinions before making decisions regarding safety	1.000	.778
Management involves employees in decisions regarding safety regarding safety	1.000	.656
Management collects accurate information in accident investigations	1.000	.737
Fear of sanctions (negative consequences) from management discourages employees here from reporting near-miss accidents	1.000	.670

Management listens carefully to all who have been involved in an accident event	1.000	.747
Management looks for causes, not guilty persons, when an accident occurs	1.000	.626
Management always blames employees for accidents	1.000	.665
Management treats employees involved in an accident fairly	1.000	.618
We who work here try hard together to achieve a high level of safety	1.000	.756
We who work here take joint responsibility to ensure that the workplace is always kept tidy	1.000	.694
We who work here do not care about each others' safety	1.000	.656
We who work here avoid tackling risks that are discovered	1.000	.663
We who work here help each other to work safely	1.000	.742
We who work here take no responsibility for each others' safety	1.000	.563
We who work here regard risks as unavoidable	1.000	.551
We who work here consider minor accidents as a normal part of our daily work	1.000	.667
We who work here accept dangerous behaviour as long as there are no accidents	1.000	.728
We who work here break safety rules in order to complete work on time	1.000	.677
We who work here never accept risk-taking even if the work schedule is tight	1.000	.771
We who work here consider that our work is unsuitable for cowards	1.000	.547

We who work here accept risk-taking at work	1.000	.599
We who work here try to find a solution if someone points out a safety problem	1.000	.660
We who work here feel safe when working together	1.000	.812
We who work here have great trust in each others' ability to ensure safety	1.000	.808
We who work here learn from our experiences to prevent accidents	1.000	.818
We who work here take each others' opinions and suggestions concerning safety seriously	1.000	.843
We who work here seldom talk about safety	1.000	.624
We who work here always discuss safety issues when such issues come up	1.000	.632
We who work here can talk freely and openly about safety	1.000	.751
We who work here consider that a good safety representative plays an important role in preventing accidents	1.000	.662
We who work here consider that safety conversations /audits / inspections have no effect on safety	1.000	.666
We who work here consider that safety training is good for preventing accidents	1.000	.700
We who work here consider early planning for safety as meaningless	1.000	.698
We who work here consider that safety conversations / audits / inspections help find serious hazards	1.000	.757
We who work here consider that safety training is meaningless	1.000	.707

We who work here consider that it is important that there are clear-cut goals for safety	1.000	.729

Extraction Method: Principal Component Analysis.

Total Variance Explained

Componen t	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	20.713	41.426	41.426	20.713	41.426	41.426	9.702	19.404	19.404
2	3.366	6.732	48.158	3.366	6.732	48.158	6.599	13.198	32.603
3	2.914	5.829	53.987	2.914	5.829	53.987	5.408	10.816	43.419
4	1.625	3.250	57.237	1.625	3.250	57.237	3.144	6.287	49.706
5	1.407	2.813	60.050	1.407	2.813	60.050	2.575	5.150	54.856
6	1.356	2.712	62.762	1.356	2.712	62.762	2.302	4.605	59.460
7	1.159	2.318	65.080	1.159	2.318	65.080	2.047	4.095	63.555
8	1.093	2.186	67.267	1.093	2.186	67.267	1.463	2.925	66.480
9	1.001	2.001	69.268	1.001	2.001	69.268	1.394	2.787	69.268
10	.936	1.872	71.140						
11	.876	1.752	72.892						
12	.814	1.629	74.520						
13	.791	1.583	76.103						
14	.721	1.442	77.545						
15	.704	1.409	78.954						
16	.659	1.318	80.273						
17	.656	1.313	81.586						
18	.590	1.180	82.766						
19	.572	1.143	83.909						
20	.538	1.077	84.986						
21	.522	1.044	86.030						
22	.497	.995	87.024						
23	.466	.932	87.957						
24	.430	.861	88.818						
25	.413	.826	89.644						
26	.395	.789	90.433						
27	.358	.715	91.148						
28	.338	.676	91.824						
29	.320	.640	92.464						
30	.304	.607	93.071						

31	.299	.598	93.670						
32	.278	.556	94.225						
33	.271	.542	94.767						
34	.264	.527	95.294						
35	.242	.485	95.779						
36	.232	.464	96.243						
37	.226	.452	96.695						
38	.211	.423	97.118						
39	.184	.368	97.485						
40	.159	.319	97.804						
41	.158	.316	98.120						
42	.145	.290	98.410						
43	.136	.273	98.683						
44	.118	.237	98.919						
45	.117	.233	99.153						
46	.106	.212	99.365						
47	.095	.191	99.556						
48	.088	.175	99.731						
49	.069	.138	99.870						
50	.065	.130	100.000						

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component								
	1	2	3	4	5	6	7	8	9
Management encourages employees here to work in accordance with safety rules - even when the work schedule is tight	.731	-.167	.256	-.128	-.005	.177	.021	-.136	.014
Management ensures that everyone receives the necessary information on safety	.693	-.147	.264	-.044	.047	-.021	.015	-.168	-.118
Management looks the other way when someone is careless with safety	.544	.172	.116	-.294	-.058	.135	.376	-.200	-.009
Management places safety before production	.425	-.209	.336	-.056	-.210	.212	.014	.066	.494

Management accepts employees here taking risks when the work schedule is tight	.570	.305	.139	-.141	.044	-.005	.313	-.031	.248
We who work here have confidence in the management's ability to handle safety	.802	-.207	.224	-.046	.051	-.009	-.019	-.138	.072
Management ensures that safety problems discovered during safety conversations / audits / inspections are corrected immediately	.696	-.249	.236	-.038	.145	.021	.009	.110	-.035
When a risk is detected, management ignores it without action	.751	.167	.190	-.069	-.270	-.071	.034	.192	.130
Management lacks the ability to handle safety properly	.732	.065	.166	.020	-.372	-.209	.002	.001	.188
Management strives to design safety routines that are meaningful and actually work	.719	-.243	.203	-.032	.132	.013	-.045	-.054	-.122
Management makes sure that each and everyone can influence safety in their work	.764	-.254	.230	.051	.151	.054	-.031	-.157	.065
Management encourages employees here to participate in decisions which affect their safety	.533	-.135	.330	.391	.308	-.005	-.102	-.115	.049
Management never considers employees' suggestions regarding safety suggestions regarding safety	.676	.065	.138	.114	-.256	.168	-.122	.163	-.227
Management strives for everybody at the worksite to have high competence concerning safety and risks	.708	-.010	.178	.151	.241	-.095	-.105	-.190	.123

Management never asks employees for their opinions before making decisions regarding safety	.654	.144	.200	.113	-.284	.049	-.151	.039	-.412
Management involves employees in decisions regarding safety regarding safety	.682	-.247	.051	.187	-.055	-.076	-.126	.047	-.257
Management collects accurate information in accident investigations	.756	-.291	.113	.004	-.113	.026	.135	.162	-.101
Fear of sanctions (negative consequences) from management discourages employees here from reporting near-miss accidents	.602	.100	.362	-.165	.017	-.240	-.276	-.043	.058
Management listens carefully to all who have been involved in an accident event	.762	-.295	.159	.066	-.161	.026	.095	.048	-.107
Management looks for causes, not guilty persons, when an accident occurs	.696	-.251	.243	.015	-.075	-.040	.091	-.034	-.055
Management always blames employees for accidents	.589	.215	.422	.090	.062	-.241	-.114	-.031	.093
Management treats employees involved in an accident fairly	.655	-.294	.234	.023	-.123	-.072	.139	.045	.070
We who work here try hard together to achieve a high level of safety	.749	-.223	-.176	-.098	.235	-.098	-.034	.196	.020
We who work here take joint responsibility to ensure that the workplace is always kept tidy	.650	-.190	-.172	-.211	.134	-.169	-.170	.292	.007
We who work here do not care about each others' safety	.512	.531	-.105	.056	-.114	-.153	-.178	.171	-.003

We who work here avoid tackling risks that are discovered	.298	.397	.134	.103	.241	-.348	.362	-.065	-.271
We who work here help each other to work safely	.765	-.164	-.174	-.087	.273	.059	-.015	.099	-.064
We who work here take no responsibility for each others' safety	.685	.197	.153	-.030	-.121	-.018	.004	.112	-.056
We who work here regard risks as unavoidable	.516	.299	-.004	-.348	-.132	.090	.107	.157	-.113
We who work here consider minor accidents as a normal part of our daily work	.510	.334	.118	-.349	.112	.058	.291	-.101	-.221
We who work here accept dangerous behaviour as long as there are no accidents	.526	.591	-.103	-.172	.164	.013	.101	.019	.155
We who work here break safety rules in order to complete work on time	.701	.198	.081	-.125	.171	-.217	-.182	.078	.096
We who work here never accept risk-taking even if the work schedule is tight	.288	-.070	.005	.469	.195	.049	.405	.508	.032
We who work here consider that our work is unsuitable for cowards	.508	.407	-.093	.202	.138	-.036	-.190	-.124	-.042
We who work here accept risk-taking at work	.539	.292	-.176	-.227	.123	-.084	-.256	.232	.002
We who work here try to find a solution if someone points out a safety problem	.648	.067	-.362	.160	.270	-.017	.069	.024	.030
We who work here feel safe when working together	.613	-.068	-.452	.356	-.142	-.167	.109	-.198	.026
We who work here have great trust in each others' ability to ensure safety	.715	-.235	-.431	.001	-.056	-.165	-.009	-.154	.031
We who work here learn from our experiences to prevent accidents	.685	-.118	-.479	-.047	-.256	-.190	.032	.017	.014

We who work here take each others' opinions and suggestions concerning safety seriously	.684	-.242	-.464	-.044	-.171	-.217	.140	-.045	.025
We who work here seldom talk about safety	.340	.327	.052	.505	-.060	.293	.050	.177	.144
We who work here always discuss safety issues when such issues come up	.620	-.138	-.403	.020	-.088	-.179	.056	-.115	.098
We who work here can talk freely and openly about safety	.771	-.054	-.294	.100	-.152	-.007	.004	-.182	.015
We who work here consider that a good safety representative plays an important role in preventing accidents	.646	-.112	-.292	-.212	.135	.222	-.039	.179	-.013
We who work here consider that safety conversations /audits / inspections have no effect on safety	.607	.407	-.080	.143	-.158	.244	-.050	-.106	-.080
We who work here consider that safety training is good for preventing accidents	.711	-.080	-.239	-.073	.027	.300	-.126	.056	.128
We who work here consider early planning for safety as meaningless	.648	.473	-.081	.157	.001	.095	.013	-.116	-.003
We who work here consider that safety conversations / audits / inspections help find serious hazards	.648	-.095	-.196	-.070	.018	.486	-.146	-.133	-.099
We who work here consider that safety training is meaningless	.603	.496	-.162	.090	.007	.163	-.092	-.129	.108
We who work here consider that it is important that there are clear-cut goals for safety	.715	-.203	-.234	-.036	.230	.237	.069	-.078	-.023

Extraction Method: Principal Component Analysis.[a]

a. 9 components extracted.

Rotated Component Matrix[a]

	Component								
	1	2	3	4	5	6	7	8	9
Management encourages employees here to work in accordance with safety rules - even when the work schedule is tight	.663	.181	.127	.285	.049	.263	.142	-.045	.179
Management ensures that everyone receives the necessary information on safety	.684	.202	.126	.234	.052	.101	.152	-.047	-.020
Management looks the other way when someone is careless with safety	.286	.172	.163	.673	-.049	.133	.070	-.041	.103
Management places safety before production	.448	.036	.034	.091	.012	.089	.005	.068	.674
Management accepts employees here taking risks when the work schedule is tight	.285	.141	.346	.559	.115	-.040	-.089	.128	.216
We who work here have confidence in the management's ability to handle safety	.746	.296	.158	.199	.121	.139	.063	-.022	.141
Management ensures that safety problems discovered during safety conversations / audits / inspections are corrected immediately	.673	.173	.033	.153	.236	.174	.123	.162	.060
When a risk is detected, management ignores it without action	.411	.240	.340	.319	.273	-.089	.330	.101	.348
Management lacks the ability to handle safety properly	.464	.381	.318	.211	.131	-.219	.283	-.021	.364

Management strives to design safety routines that are meaningful and actually work	.703	.224	.076	.142	.158	.200	.139	.030	-.035
Management makes sure that each and everyone can influence safety in their work	.776	.252	.159	.116	.063	.203	-.001	.039	.088
Management encourages employees here to participate in decisions which affect their safety	.722	.029	.293	-.133	-.037	.048	-.096	.205	-.069
Management never considers employees' suggestions regarding safety suggestions regarding safety	.402	.162	.328	.095	.116	.174	.556	.110	.101
Management strives for everybody at the worksite to have high competence concerning safety and risks	.673	.223	.385	.069	.116	.044	-.119	.022	-.007
Management never asks employees for their opinions before making decisions regarding safety	.429	.133	.361	.128	.063	.058	.645	-.019	-.077
Management involves employees in decisions regarding safety regarding safety	.574	.362	.123	-.070	.123	.107	.357	.104	-.103
Management collects accurate information in accident investigations	.581	.368	-.011	.199	.147	.151	.331	.229	.131
Fear of sanctions (negative consequences) from management discourages employees here from reporting near-miss accidents	.588	.030	.283	.142	.355	-.147	.116	-.227	.103
Management listens carefully to all who have been involved in an accident event	.636	.369	.034	.156	.046	.126	.345	.159	.132

Management looks for causes, not guilty persons, when an accident occurs	.662	.280	.034	.191	.046	.050	.220	.084	.106
Management always blames employees for accidents	.592	-.014	.421	.152	.200	-.253	.067	.001	.070
Management treats employees involved in an accident fairly	.619	.305	-.023	.171	.063	-.012	.181	.152	.227
We who work here try hard together to achieve a high level of safety	.464	.467	.074	.109	.464	.236	.003	.181	-.018
We who work here take joint responsibility to ensure that the workplace is always kept tidy	.357	.405	.025	.051	.597	.163	.095	.069	.029
We who work here do not care about each others' safety	.030	.185	.628	.145	.358	-.120	.248	.027	.024
We who work here avoid tackling risks that are discovered	.191	.044	.292	.439	.032	-.329	-.005	.206	-.441
We who work here help each other to work safely	.466	.415	.145	.168	.361	.376	.020	.157	-.084
We who work here take no responsibility for each others' safety	.391	.172	.359	.292	.223	.009	.313	.079	.110
We who work here regard risks as unavoidable	.087	.121	.229	.513	.304	.137	.305	-.017	.094
We who work here consider minor accidents as a normal part of our daily work	.234	.042	.226	.698	.137	.119	.117	-.043	-.155
We who work here accept dangerous behaviour as long as there are no accidents	.037	.122	.591	.499	.311	.061	-.100	.045	.036
We who work here break safety rules in order to complete work on time	.451	.199	.399	.196	.484	-.032	.007	-.034	.027

We who work here never accept risk-taking even if the work schedule is tight	.165	.110	.068	.015	.049	.001	.039	.850	-.006
We who work here consider that our work is unsuitable for cowards	.203	.173	.652	.055	.134	.051	.029	-.012	-.163
We who work here accept risk-taking at work	.106	.191	.381	.158	.593	.132	.102	-.046	-.011
We who work here try to find a solution if someone points out a safety problem	.232	.502	.376	.112	.215	.234	-.109	.258	-.145
We who work here feel safe when working together	.195	.790	.334	-.025	-.111	.018	.057	.136	-.053
We who work here have great trust in each others' ability to ensure safety	.316	.794	.138	.057	.155	.166	.030	-.045	-.005
We who work here learn from our experiences to prevent accidents	.140	.807	.150	.120	.226	.079	.209	.001	.091
We who work here take each others' opinions and suggestions concerning safety seriously	.220	.849	.039	.152	.164	.082	.107	.041	.049
We who work here seldom talk about safety	.092	-.012	.577	-.036	-.126	.095	.143	.445	.192
We who work here always discuss safety issues when such issues come up	.218	.724	.164	.092	.127	.077	.003	.003	.048
We who work here can talk freely and openly about safety	.342	.664	.338	.124	.026	.188	.152	-.013	.066
We who work here consider that a good safety representative plays an important role in preventing accidents	.229	.385	.113	.188	.381	.496	.085	.108	.063

We who work here consider that safety conversations /audits / inspections have no effect on safety	.158	.208	.641	.228	-.031	.217	.288	.013	.050
We who work here consider that safety training is good for preventing accidents	.302	.400	.278	.096	.242	.497	.079	.056	.218
We who work here consider early planning for safety as meaningless	.203	.236	.698	.284	.045	.107	.118	.070	-.019
We who work here consider that safety conversations / audits / inspections help find serious hazards	.318	.303	.263	.113	.036	.663	.180	-.068	.067
We who work here consider that safety training is meaningless	.116	.230	.731	.232	.097	.190	.043	-.016	.070
We who work here consider that it is important that there are clear-cut goals for safety	.420	.451	.149	.187	.124	.507	-.040	.128	-.038

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.[a]

a. Rotation converged in 13 iterations.

Component Transformation Matrix

Component	1	2	3	4	5	6	7		
1	.623	.474	.386	.279	.253	.193	.203		
2	-.388	-.281	.757	.365	.102	-.202	.038		
3	.587	-.692	-.067	.127	-.123	-.304	.134		
4	.114	.082	.382	-.550	-.458	-.174	.037		
5	.220	-.239	.035	.003	.287	.256	-.663		
6	-.092	-.305	.109	.060	-.305	.834	.116		
7	-.091	.162	-.264	.670	-.382	-.150	-.129		
8	-.194	-.172	-.155	-.108	.612	-.023	.315		
9	-.018	.072	.143	-.079	.063	-.127	-.607		

NOSACQ-50 EFA - 7-Factor Extraction

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FACTOR
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 /CRITERIA FACTORS(7) ITERATE(200)
 /EXTRACTION ML
 /CRITERIA ITERATE(200)
 /ROTATION VARIMAX.
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Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.926
Bartlett's Test of Sphericity	Approx. Chi-Square	5973.888
	df	1225
	Sig.	.000

Communalities

	Initial	Extraction
Management encourages employees here to work in accordance with safety rules - even when the work schedule is tight	.761	.661
Management ensures that everyone receives the necessary information on safety	.712	.586
Management looks the other way when someone is careless with safety	.623	.333
Management places safety before production	.519	.320
Management accepts employees here taking risks when the work schedule is tight	.598	.412
We who work here have confidence in the management's ability to handle safety	.806	.764

Management ensures that safety problems discovered during safety conversations / audits / inspections are corrected immediately	.677	.602
When a risk is detected, management ignores it without action	.837	.750
Management lacks the ability to handle safety properly	.834	.787
Management strives to design safety routines that are meaningful and actually work	.736	.611
Management makes sure that each and everyone can influence safety in their work	.819	.729
Management encourages employees here to participate in decisions which affect their safety	.642	.519
Management never considers employees' suggestions regarding safety suggestions regarding safety	.695	.486
Management strives for everybody at the worksite to have high competence concerning safety and risks	.734	.614
Management never asks employees for their opinions before making decisions regarding safety	.752	.505
Management involves employees in decisions regarding safety regarding safety	.691	.508
Management collects accurate information in accident investigations	.811	.795
Fear of sanctions (negative consequences) from management discourages employees here from reporting near-miss accidents	.651	.515
Management listens carefully to all who have been involved in an accident event	.853	.835

Management looks for causes, not guilty persons, when an accident occurs	.687	.624
Management always blames employees for accidents	.688	.598
Management treats employees involved in an accident fairly	.730	.587
We who work here try hard together to achieve a high level of safety	.764	.758
We who work here take joint responsibility to ensure that the workplace is always kept tidy	.658	.553
We who work here do not care about each others' safety	.690	.551
We who work here avoid tackling risks that are discovered	.481	.243
We who work here help each other to work safely	.813	.726
We who work here take no responsibility for each others' safety	.711	.523
We who work here regard risks as unavoidable	.565	.383
We who work here consider minor accidents as a normal part of our daily work	.616	.365
We who work here accept dangerous behaviour as long as there are no accidents	.726	.618
We who work here break safety rules in order to complete work on time	.686	.631
We who work here never accept risk-taking even if the work schedule is tight	.445	.152
We who work here consider that our work is unsuitable for cowards	.543	.408
We who work here accept risk-taking at work	.591	.475

We who work here try to find a solution if someone points out a safety problem	.718	.643
We who work here feel safe when working together	.806	.877
We who work here have great trust in each others' ability to ensure safety	.849	.852
We who work here learn from our experiences to prevent accidents	.834	.807
We who work here take each others' opinions and suggestions concerning safety seriously	.847	.826
We who work here seldom talk about safety	.475	.260
We who work here always discuss safety issues when such issues come up	.702	.556
We who work here can talk freely and openly about safety	.820	.687
We who work here consider that a good safety representative plays an important role in preventing accidents	.657	.588
We who work here consider that safety conversations /audits / inspections have no effect on safety	.661	.613
We who work here consider that safety training is good for preventing accidents	.666	.612
We who work here consider early planning for safety as meaningless	.743	.653
We who work here consider that safety conversations / audits / inspections help find serious hazards	.711	.697
We who work here consider that safety training is meaningless	.781	.664
We who work here consider that it is important that there are clear-cut goals for safety	.738	.667

Extraction Method: Maximum Likelihood.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	20.713	41.426	41.426	20.078	40.157	40.157	10.108	20.217	20.217
2	3.366	6.732	48.158	2.682	5.363	45.520	7.412	14.824	35.041
3	2.914	5.829	53.987	2.950	5.900	51.420	6.768	13.535	48.576
4	1.625	3.250	57.237	1.197	2.394	53.814	1.720	3.439	52.015
5	1.407	2.813	60.050	1.015	2.031	55.844	1.351	2.701	54.717
6	1.356	2.712	62.762	.859	1.718	57.562	1.345	2.689	57.406
7	1.159	2.318	65.080	.750	1.500	59.062	.828	1.657	59.062
8	1.093	2.186	67.267						
9	1.001	2.001	69.268						
10	.936	1.872	71.140						
11	.876	1.752	72.892						
12	.814	1.629	74.520						
13	.791	1.583	76.103						
14	.721	1.442	77.545						
15	.704	1.409	78.954						
16	.659	1.318	80.273						
17	.656	1.313	81.586						
18	.590	1.180	82.766						
19	.572	1.143	83.909						
20	.538	1.077	84.986						
21	.522	1.044	86.030						
22	.497	.995	87.024						
23	.466	.932	87.957						
24	.430	.861	88.818						
25	.413	.826	89.644						
26	.395	.789	90.433						
27	.358	.715	91.148						
28	.338	.676	91.824						
29	.320	.640	92.464						
30	.304	.607	93.071						
31	.299	.598	93.670						
32	.278	.556	94.225						
33	.271	.542	94.767						
34	.264	.527	95.294						
35	.242	.485	95.779						

36	.232	.464	96.243						
37	.226	.452	96.695						
38	.211	.423	97.118						
39	.184	.368	97.485						
40	.159	.319	97.804						
41	.158	.316	98.120						
42	.145	.290	98.410						
43	.136	.273	98.683						
44	.118	.237	98.919						
45	.117	.233	99.153						
46	.106	.212	99.365						
47	.095	.191	99.556						
48	.088	.175	99.731						
49	.069	.138	99.870						
50	.065	.130	100.000						

Extraction Method: Maximum Likelihood.

Factor Matrix[a]

	Factor						
	1	2	3	4	5	6	7
Management encourages employees here to work in accordance with safety rules - even when the work schedule is tight	.704	.303	-.155	.101	-.007	.033	-.195
Management ensures that everyone receives the necessary information on safety	.670	.264	-.140	-.007	.000	.151	-.158
Management looks the other way when someone is careless with safety	.508	.177	.141	.062	-.074	-.014	-.116
Management places safety before production	.401	.292	-.185	-.060	-.069	-.028	-.172
Management accepts employees here taking risks when the work schedule is tight	.525	.216	.278	-.001	-.086	.044	.049
We who work here have confidence in the management's ability to handle safety	.791	.252	-.179	.016	.081	.143	-.126

Management ensures that safety problems discovered during safety conversations / audits / inspections are corrected immediately	.681	.274	-.228	.081	.019	.024	.062
When a risk is detected, management ignores it without action	.722	.287	.188	-.190	-.269	-.034	-.037
Management lacks the ability to handle safety properly	.728	.164	.115	-.383	-.217	.111	-.103
Management strives to design safety routines that are meaningful and actually work	.706	.195	-.214	.046	.086	.123	-.060
Management makes sure that each and everyone can influence safety in their work	.752	.243	-.223	.071	.148	.150	-.074
Management encourages employees here to participate in decisions which affect their safety	.506	.274	-.122	-.033	.352	.205	.073
Management never considers employees' suggestions regarding safety suggestions regarding safety	.644	.203	.080	-.066	.006	-.115	-.075
Management strives for everybody at the worksite to have high competence concerning safety and risks	.684	.198	.035	-.011	.232	.229	-.001
Management never asks employees for their opinions before making decisions regarding safety	.616	.243	.145	-.147	.008	-.074	-.137
Management involves employees in decisions regarding safety regarding safety	.681	.047	-.181	-.067	.057	-.023	.016
Management collects accurate information in accident investigations	.767	.140	-.294	-.078	-.025	-.247	.180

Fear of sanctions (negative consequences) from management discourages employees here from reporting near-miss accidents	.558	.380	.064	-.045	-.108	.202	.033
Management listens carefully to all who have been involved in an accident event	.775	.185	-.298	-.173	.025	-.269	.089
Management looks for causes, not guilty persons, when an accident occurs	.690	.230	-.247	-.111	.045	-.093	.108
Management always blames employees for accidents	.538	.420	.180	-.168	.113	.214	.117
Management treats employees involved in an accident fairly	.652	.205	-.285	-.133	-.014	-.096	.109
We who work here try hard together to achieve a high level of safety	.760	-.078	-.151	.272	-.063	.101	.250
We who work here take joint responsibility to ensure that the workplace is always kept tidy	.656	-.073	-.104	.202	-.178	.123	.135
We who work here do not care about each others' safety	.473	.061	.531	-.033	-.076	-.039	.182
We who work here avoid tackling risks that are discovered	.255	.162	.297	-.047	.047	.095	.224
We who work here help each other to work safely	.763	-.051	-.089	.334	.038	.041	.134
We who work here take no responsibility for each others' safety	.645	.249	.173	-.026	-.098	-.045	.052
We who work here regard risks as unavoidable	.481	.120	.270	.059	-.204	-.140	-.018
We who work here consider minor accidents as a normal part of our daily work	.456	.222	.258	.160	-.121	-.014	-.023
We who work here accept dangerous behaviour as long as there are no accidents	.475	.101	.575	.174	-.076	-.024	.122
We who work here break safety rules in order to complete work on time	.663	.201	.220	.122	-.106	.268	.074

We who work here never accept risk-taking even if the work schedule is tight	.279	.010	-.041	-.041	.186	-.016	.190
We who work here consider that our work is unsuitable for cowards	.469	.047	.394	.051	.142	-.023	.087
We who work here accept risk-taking at work	.504	.011	.311	.250	-.228	.068	.075
We who work here try to find a solution if someone points out a safety problem	.656	-.234	.170	.175	.203	-.006	.242
We who work here feel safe when working together	.676	-.502	.088	-.280	.281	.020	.047
We who work here have great trust in each others' ability to ensure safety	.772	-.439	-.083	.010	-.027	.195	-.135
We who work here learn from our experiences to prevent accidents	.735	-.428	.011	-.080	-.270	-.071	-.003
We who work here take each others' opinions and suggestions concerning safety seriously	.746	-.458	-.109	-.057	-.210	.024	.027
We who work here seldom talk about safety	.304	.113	.303	-.094	.186	-.141	-.010
We who work here always discuss safety issues when such issues come up	.649	-.332	-.008	.040	-.076	.096	-.086
We who work here can talk freely and openly about safety	.791	-.211	.051	-.031	.028	-.055	-.095
We who work here consider that a good safety representative plays an important role in preventing accidents	.649	-.110	-.032	.337	-.134	-.147	-.029
We who work here consider that safety conversations /audits / inspections have no effect on safety	.575	.054	.444	-.037	.153	-.191	-.142
We who work here consider that safety training is good for preventing accidents	.708	-.076	.018	.238	.005	-.179	-.125

We who work here consider early planning for safety as meaningless	.613	.086	.496	-.004	.113	-.101	-.022
We who work here consider that safety conversations / audits / inspections help find serious hazards	.642	-.044	-.007	.302	.145	-.283	-.301
We who work here consider that safety training is meaningless	.571	.017	.544	.064	.163	-.091	-.061
We who work here consider that it is important that there are clear-cut goals for safety	.723	-.115	-.110	.295	.132	-.073	-.093

Extraction Method: Maximum Likelihood.[a]

a. 7 factors extracted. 6 iterations required.

Goodness-of-fit Test

Chi-Square	df	Sig.
1183.335	896	.000

Rotated Factor Matrix[a]

	Factor						
	1	2	3	4	5	6	7
Management encourages employees here to work in accordance with safety rules - even when the work schedule is tight	.706	.226	.202	.241	-.028	.105	-.041
Management ensures that everyone receives the necessary information on safety	.683	.209	.229	.091	-.002	.067	-.103
Management looks the other way when someone is careless with safety	.364	.379	.161	.139	-.076	.070	-.006
Management places safety before production	.537	.074	.054	.092	-.106	-.017	.059
Management accepts employees here taking risks when the work schedule is tight	.329	.522	.133	-.015	.007	.116	.014

We who work here have confidence in the management's ability to handle safety	.760	.226	.295	.146	.103	.076	-.104
Management ensures that safety problems discovered during safety conversations / audits / inspections are corrected immediately	.668	.166	.197	.134	.158	.200	.077
When a risk is detected, management ignores it without action	.565	.553	.250	-.080	-.152	.032	.179
Management lacks the ability to handle safety properly	.592	.448	.385	-.222	-.136	-.121	.069
Management strives to design safety routines that are meaningful and actually work	.672	.152	.282	.140	.142	.111	-.071
Management makes sure that each and everyone can influence safety in their work	.734	.170	.263	.174	.184	.113	-.119
Management encourages employees here to participate in decisions which affect their safety	.558	.157	.057	.030	.380	.005	-.185
Management never considers employees' suggestions regarding safety suggestions regarding safety	.493	.402	.213	.144	.033	-.041	.109
Management strives for everybody at the worksite to have high competence concerning safety and risks	.565	.350	.231	.048	.265	.040	-.214
Management never asks employees for their opinions before making decisions regarding safety	.499	.447	.175	.085	-.018	-.122	.057
Management involves employees in decisions regarding safety regarding safety	.541	.157	.374	.105	.172	.020	.097
Management collects accurate information in accident investigations	.644	.150	.345	.137	.227	.089	.401

Fear of sanctions (negative consequences) from management discourages employees here from reporting near-miss accidents	.571	.374	.072	-.113	-.007	.168	-.054
Management listens carefully to all who have been involved in an accident event	.704	.156	.320	.141	.204	-.043	.387
Management looks for causes, not guilty persons, when an accident occurs	.665	.158	.238	.066	.211	.040	.223
Management always blames employees for accidents	.541	.474	-.012	-.179	.194	.021	-.101
Management treats employees involved in an accident fairly	.646	.104	.250	.032	.167	.047	.255
We who work here try hard together to achieve a high level of safety	.428	.197	.499	.138	.253	.447	.060
We who work here take joint responsibility to ensure that the workplace is always kept tidy	.375	.187	.466	.073	.073	.384	.037
We who work here do not care about each others' safety	.066	.699	.182	-.062	.081	.085	.085
We who work here avoid tackling risks that are discovered	.108	.413	-.010	-.146	.178	.089	-.016
We who work here help each other to work safely	.419	.251	.452	.285	.247	.375	.000
We who work here take no responsibility for each others' safety	.461	.499	.183	.037	.024	.105	.122
We who work here regard risks as unavoidable	.223	.486	.181	.110	-.123	.114	.155
We who work here consider minor accidents as a normal part of our daily work	.275	.474	.077	.128	-.074	.191	.006
We who work here accept dangerous behaviour as long as there are no accidents	.050	.739	.133	.084	.036	.207	-.003
We who work here break safety rules in order to complete work on time	.438	.511	.244	-.041	.040	.303	-.153

We who work here never accept risk-taking even if the work schedule is tight	.176	.100	.118	.009	.306	.009	.059
We who work here consider that our work is unsuitable for cowards	.123	.561	.166	.102	.197	.024	-.042
We who work here accept risk-taking at work	.138	.497	.275	.084	-.070	.348	-.013
We who work here try to find a solution if someone points out a safety problem	.135	.395	.481	.187	.414	.178	-.002
We who work here feel safe when working together	.138	.259	.754	.012	.382	-.276	-.027
We who work here have great trust in each others' ability to ensure safety	.312	.146	.831	.112	.065	.055	-.153
We who work here learn from our experiences to prevent accidents	.207	.252	.807	.048	-.053	.070	.200
We who work here take each others' opinions and suggestions concerning safety seriously	.255	.139	.843	.030	.027	.111	.131
We who work here seldom talk about safety	.122	.427	.027	.100	.143	-.176	.033
We who work here always discuss safety issues when such issues come up	.236	.193	.662	.115	.022	.083	-.061
We who work here can talk freely and openly about safety	.364	.343	.620	.199	.100	-.038	.036
We who work here consider that a good safety representative plays an important role in preventing accidents	.285	.245	.445	.380	-.005	.300	.122
We who work here consider that safety conversations /audits / inspections have no effect on safety	.199	.650	.221	.248	.070	-.190	.009
We who work here consider that safety training is good for preventing accidents	.348	.315	.437	.423	.041	.122	.075

We who work here consider early planning for safety as meaningless	.206	.720	.219	.159	.116	-.067	-.010
We who work here consider that safety conversations / audits / inspections help find serious hazards	.342	.262	.346	.626	.022	-.003	.021
We who work here consider that safety training is meaningless	.116	.722	.231	.222	.124	-.070	-.081
We who work here consider that it is important that there are clear-cut goals for safety	.394	.192	.469	.444	.174	.162	-.032

Extraction Method: Maximum Likelihood.

Rotation Method: Varimax with Kaiser Normalization.[a]

a. Rotation converged in 7 iterations.

Factor Transformation Matrix

Factor	1	2	3	4	5	6	7
1	.627	.441	.587	.168	.159	.100	.067
2	.582	.222	-.769	-.054	-.086	.090	.041
3	-.444	.862	-.093	-.069	-.087	-.096	-.170
4	-.163	-.008	-.100	.641	.003	.710	-.221
5	.013	-.029	-.172	.314	.749	-.421	-.363
6	.137	-.083	.105	-.523	.013	.274	-.784
7	-.158	.075	-.063	-.425	.631	.466	.413

Extraction Method: Maximum Likelihood.

Rotation Method: Varimax with Kaiser Normalization.

ALI EFA - Initial Extraction

```
FACTOR
 /VARIABLES AL1_R AL2_M AL3_B AL4_S AL5_M AL6_B AL7_S AL8_R AL9_M AL10_B AL11_S AL12_R AL13_M
   AL14_B
 /MISSING LISTWISE
 /ANALYSIS AL1_R AL2_M AL3_B AL4_S AL5_M AL6_B AL7_S AL8_R AL9_M AL10_B AL11_S AL12_R AL13_M AL14_B
 /PRINT INITIAL KMO EXTRACTION ROTATION
 /CRITERIA MINEIGEN(1) ITERATE(200)
 /EXTRACTION ML
 /CRITERIA ITERATE(200)
 /ROTATION VARIMAX.
```

Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.956
Bartlett's Test of Sphericity	Approx. Chi-Square	1962.066
	df	91
	Sig.	.000

Communalities

	Initial	Extraction
My leader clearly states what he/she means.	.783	.709
My leader shows consistency between his/her beliefs and actions.	.819	.782
My leader asks for ideas that challenge his/her core beliefs.	.688	.660
My leader describes accurately the way that others view his/her abilities.	.661	.584
My leader uses his/her core beliefs to make decisions.	.633	.574
My leader carefully listens to alternative perspectives before reaching a conclusion.	.780	.756
My leader shows that he/she understands his/her strengths and weaknesses.	.822	.816
My leader openly shares information with others.	.680	.680

My leader resists pressures on him/her to do things contrary to his/her beliefs.	.230	.192
My leader objectively analyzes relevant data before making a decision.	.708	.690
My leader is clearly aware of the impact he/she has on others.	.666	.629
My leader expresses his/her ideas and thoughts clearly to others.	.761	.712
My leader is guided in his/her actions by internal moral standards.	.637	.584
My leader encourages others to voice opposing points of view.	.705	.707

Extraction Method: Maximum Likelihood.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.406	67.188	67.188	9.075	64.824	64.824
2	.843	6.025	73.213			
3	.604	4.312	77.526			
4	.508	3.627	81.153			
5	.463	3.308	84.461			
6	.397	2.833	87.295			
7	.306	2.184	89.479			
8	.299	2.138	91.617			
9	.289	2.066	93.683			
10	.257	1.835	95.518			
11	.206	1.469	96.987			
12	.167	1.196	98.183			
13	.142	1.013	99.196			
14	.113	.804	100.000			

Extraction Method: Maximum Likelihood.

Factor Matrix[a]

	Factor
	1

My leader clearly states what he/she means.	.842
My leader shows consistency between his/her beliefs and actions.	.884
My leader asks for ideas that challenge his/her core beliefs.	.812
My leader describes accurately the way that others view his/her abilities.	.764
My leader uses his/her core beliefs to make decisions.	.758
My leader carefully listens to alternative perspectives before reaching a conclusion.	.869
My leader shows that he/she understands his/her strengths and weaknesses.	.904
My leader openly shares information with others.	.825
My leader resists pressures on him/her to do things contrary to his/her beliefs.	.438
My leader objectively analyzes relevant data before making a decision.	.831
My leader is clearly aware of the impact he/she has on others.	.793
My leader expresses his/her ideas and thoughts clearly to others.	.844
My leader is guided in his/her actions by internal moral standards.	.764
My leader encourages others to voice opposing points of view.	.841

Extraction Method: Maximum Likelihood.[a]

a. 1 factors extracted. 4 iterations required.

Goodness-of-fit Test

Chi-Square	df	Sig.
180.008	77	.000

Rotated Factor Matrix[a]

a. Only one factor was extracted. The solution cannot be rotated.

ALI EFA - 4-Factor Extraction

```
FACTOR
 /VARIABLES AL1_R AL2_M AL3_B AL4_S AL5_M AL6_B AL7_S AL8_R AL9_M AL10_B AL11_S AL12_R AL13_M
  AL14_B
 /MISSING LISTWISE
 /ANALYSIS AL1_R AL2_M AL3_B AL4_S AL5_M AL6_B AL7_S AL8_R AL9_M AL10_B AL11_S AL12_R AL13_M AL14_B
 /PRINT INITIAL KMO EXTRACTION ROTATION
 /CRITERIA FACTORS(4) ITERATE(200)
 /EXTRACTION ML
 /CRITERIA ITERATE(200)
 /ROTATION VARIMAX.
```

Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.956
Bartlett's Test of Sphericity	Approx. Chi-Square	1962.066
	df	91
	Sig.	.000

Communalities[a]

	Initial	Extraction
My leader clearly states what he/she means.	.783	.999
My leader shows consistency between his/her beliefs and actions.	.819	.821
My leader asks for ideas that challenge his/her core beliefs.	.688	.691
My leader describes accurately the way that others view his/her abilities.	.661	.931
My leader uses his/her core beliefs to make decisions.	.633	.605

My leader carefully listens to alternative perspectives before reaching a conclusion.	.780	.827
My leader shows that he/she understands his/her strengths and weaknesses.	.822	.885
My leader openly shares information with others.	.680	.693
My leader resists pressures on him/her to do things contrary to his/her beliefs.	.230	.224
My leader objectively analyzes relevant data before making a decision.	.708	.714
My leader is clearly aware of the impact he/she has on others.	.666	.672
My leader expresses his/her ideas and thoughts clearly to others.	.761	.850
My leader is guided in his/her actions by internal moral standards.	.637	.630
My leader encourages others to voice opposing points of view.	.705	.723

Extraction Method: Maximum Likelihood.[a]

a. One or more communalitiy estimates greater than 1 were encountered during iterations. The resulting solution should be interpreted with caution.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.406	67.188	67.188	7.041	50.292	50.292
2	.843	6.025	73.213	2.388	17.059	67.351
3	.604	4.312	77.526	.551	3.933	71.284
4	.508	3.627	81.153	.285	2.034	73.318
5	.463	3.308	84.461			
6	.397	2.833	87.295			
7	.306	2.184	89.479			
8	.299	2.138	91.617			
9	.289	2.066	93.683			

10	.257	1.835	95.518						
11	.206	1.469	96.987						
12	.167	1.196	98.183						
13	.142	1.013	99.196						
14	.113	.804	100.000						

Factor Matrix[a]

	Factor			
	1	2	3	4
My leader clearly states what he/she means.	.999	-.020	-.001	.000
My leader shows consistency between his/her beliefs and actions.	.862	.272	.025	-.060
My leader asks for ideas that challenge his/her core beliefs.	.676	.483	-.031	-.006
My leader describes accurately the way that others view his/her abilities.	.665	.549	-.431	.029
My leader uses his/her core beliefs to make decisions.	.683	.358	-.047	.090
My leader carefully listens to alternative perspectives before reaching a conclusion.	.739	.442	.159	-.243
My leader shows that he/she understands his/her strengths and weaknesses.	.746	.487	.221	-.205
My leader openly shares information with others.	.695	.401	.214	.063
My leader resists pressures on him/her to do things contrary to his/her beliefs.	.350	.249	.114	.161
My leader objectively analyzes relevant data before making a decision.	.692	.426	.198	.117
My leader is clearly aware of the impact he/she has on others.	.648	.429	.211	.151
My leader expresses his/her ideas and thoughts clearly to others.	.741	.358	.293	.295
My leader is guided in his/her actions by internal moral standards.	.574	.521	.127	.118

My leader encourages others to voice opposing points of view.	.669	.479	.204	-.062

Extraction Method: Maximum Likelihood.[a]

a. 4 factors extracted. 22 iterations required.

Goodness-of-fit Test

Chi-Square	df	Sig.
39.325	41	.545

Rotated Factor Matrix[a]

	Factor			
	1	2	3	4
My leader clearly states what he/she means.	.361	.309	.295	.828
My leader shows consistency between his/her beliefs and actions.	.410	.450	.387	.549
My leader asks for ideas that challenge his/her core beliefs.	.440	.422	.491	.279
My leader describes accurately the way that others view his/her abilities.	.291	.271	.839	.263
My leader uses his/her core beliefs to make decisions.	.444	.292	.444	.355
My leader carefully listens to alternative perspectives before reaching a conclusion.	.382	.674	.327	.346
My leader shows that he/she understands his/her strengths and weaknesses.	.460	.690	.306	.320
My leader openly shares information with others.	.577	.433	.264	.321
My leader resists pressures on him/her to do things contrary to his/her beliefs.	.400	.145	.161	.131
My leader objectively analyzes relevant data before making a decision.	.615	.396	.293	.304

My leader is clearly aware of the impact he/she has on others.	.629	.363	.273	.264
My leader expresses his/her ideas and thoughts clearly to others.	.767	.285	.207	.370
My leader is guided in his/her actions by internal moral standards.	.577	.373	.364	.159
My leader encourages others to voice opposing points of view.	.514	.549	.300	.260

Extraction Method: Maximum Likelihood.

Rotation Method: Varimax with Kaiser Normalization.[a]

a. Rotation converged in 6 iterations.

Factor Transformation Matrix

Factor	1	2	3	4
1	.371	.319	.305	.817
2	.431	.443	.541	-.570
3	.491	.376	-.782	-.078
4	.660	-.749	.057	-.028

Extraction Method: Maximum Likelihood.

Rotation Method: Varimax with Kaiser Normalization.

Post-Intervention Exploratory Factor Analysis

NOSACQ-50 EFA - Initial Extraction

```
FACTOR
 /VARIABLES SC1.1 SC1.2 SC1.3_r SC1.4 SC1.5_r SC1.6 SC1.7 SC1.8_r SC1.9_r SC2.1 SC2.2 SC2.3
   SC2.4_r SC2.5 SC2.6_r SC2.7 SC3.1 SC3.2_r SC3.3 SC3.4 SC3.5_r SC3.6 SC4.1 SC4.2 SC4.3_r SC4.4_r
   SC4.5 SC4.6_r SC5.1_r SC5.2_r SC5.3_r SC5.4_r SC5.5 SC5.6_r SC5.7_r SC6.1 SC6.2 SC6.3 SC6.4 SC6.5
   SC6.6_r SC6.7 SC6.8 SC7.1 SC7.2_r SC7.3 SC7.4_r SC7.5 SC7.6_r SC7.7
 /MISSING LISTWISE
 /ANALYSIS SC1.1 SC1.2 SC1.3_r SC1.4 SC1.5_r SC1.6 SC1.7 SC1.8_r SC1.9_r SC2.1 SC2.2 SC2.3 SC2.4_r
   SC2.5 SC2.6_r SC2.7 SC3.1 SC3.2_r SC3.3 SC3.4 SC3.5_r SC3.6 SC4.1 SC4.2 SC4.3_r SC4.4_r SC4.5
   SC4.6_r SC5.1_r SC5.2_r SC5.3_r SC5.4_r SC5.5 SC5.6_r SC5.7_r SC6.1 SC6.2 SC6.3 SC6.4 SC6.5 SC6.6_r
   SC6.7 SC6.8 SC7.1 SC7.2_r SC7.3 SC7.4_r SC7.5 SC7.6_r SC7.7
 /PRINT INITIAL KMO ROTATION
 /CRITERIA MINEIGEN(1) ITERATE(200)
 /EXTRACTION ML
 /CRITERIA ITERATE(200)
 /ROTATION VARIMAX.
```

---------- FACTOR ANALYSIS ----------

Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.921
Bartlett's Test of Sphericity	Approx. Chi-Square	5919.759
	df	1225
	Sig.	.000

Communalities[a]

	Initial
Management encourages employees here to work in accordance with safety rules - even when the work schedule is tight	.790
Management ensures that everyone receives the necessary information on safety	.797
Management looks the other way when someone is careless with safety	.577
Management places safety before production	.523
Management accepts employees here taking risks when the work schedule is tight	.701

We who work here have confidence in the management's ability to handle safety	.812
Management ensures that safety problems discovered during safety conversations / audits / inspections are corrected immediately	.688
When a risk is detected, management ignores it without action	.754
Management lacks the ability to handle safety properly	.821
Management strives to design safety routines that are meaningful and actually work	.709
Management makes sure that each and everyone can influence safety in their work	.785
Management encourages employees here to participate in decisions which affect their safety	.666
Management never considers employees' suggestions regarding safety suggestions regarding safety	.686
Management strives for everybody at the worksite to have high competence concerning safety and risks	.739
Management never asks employees for their opinions before making decisions regarding safety	.756
Management involves employees in decisions regarding safety regarding safety	.757
Management collects accurate information in accident investigations	.762
Fear of sanctions (negative consequences) from management discourages employees here from reporting near-miss accidents	.643

Management listens carefully to all who have been involved in an accident event	.677
Management looks for causes, not guilty persons, when an accident occurs	.613
Management always blames employees for accidents	.805
Management treats employees involved in an accident fairly	.695
We who work here try hard together to achieve a high level of safety	.756
We who work here take joint responsibility to ensure that the workplace is always kept tidy	.658
We who work here do not care about each others' safety	.513
We who work here avoid tackling risks that are discovered	.515
We who work here help each other to work safely	.809
We who work here take no responsibility for each others' safety	.641
We who work here regard risks as unavoidable	.435
We who work here consider minor accidents as a normal part of our daily work	.626
We who work here accept dangerous behaviour as long as there are no accidents	.816
We who work here break safety rules in order to complete work on time	.770
We who work here never accept risk-taking even if the work schedule is tight	.465
We who work here consider that our work is unsuitable for cowards	.536
We who work here accept risk-taking at work	.738

We who work here try to find a solution if someone points out a safety problem	.843
We who work here feel safe when working together	.776
We who work here have great trust in each others' ability to ensure safety	.835
We who work here learn from our experiences to prevent accidents	.717
We who work here take each others' opinions and suggestions concerning safety seriously	.885
We who work here seldom talk about safety	.539
We who work here always discuss safety issues when such issues come up	.778
We who work here can talk freely and openly about safety	.774
We who work here consider that a good safety representative plays an important role in preventing accidents	.554
We who work here consider that safety conversations /audits / inspections have no effect on safety	.730
We who work here consider that safety training is good for preventing accidents	.763
We who work here consider early planning for safety as meaningless	.780
We who work here consider that safety conversations / audits / inspections help find serious hazards	.647
We who work here consider that safety training is meaningless	.823
We who work here consider that it is important that there are clear-cut goals for safety	.780

Extraction Method: Maximum Likelihood.[a]

a. One or more communalitiy estimates greater than 1 were encountered during iterations. The resulting solution should be interpreted with caution.

Total Variance Explained

	Initial Eigenvalues			Rotation Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	21.235	42.470	42.470	7.818	15.637	15.637
2	2.811	5.622	48.092	7.098	14.197	29.833
3	2.560	5.119	53.212	5.640	11.281	41.114
4	1.558	3.116	56.328	2.827	5.653	46.767
5	1.399	2.799	59.127	2.793	5.586	52.353
6	1.308	2.615	61.742	1.500	2.999	55.353
7	1.234	2.468	64.210	1.239	2.478	57.831
8	1.163	2.327	66.536	.803	1.607	59.438
9	1.038	2.077	68.613	.789	1.578	61.016
10	.932	1.865	70.478			
11	.893	1.786	72.264			
12	.874	1.748	74.011			
13	.816	1.631	75.643			
14	.738	1.475	77.118			
15	.718	1.437	78.555			
16	.698	1.397	79.952			
17	.665	1.330	81.282			
18	.629	1.257	82.539			
19	.587	1.174	83.713			
20	.548	1.096	84.809			
21	.518	1.036	85.845			
22	.511	1.021	86.866			
23	.470	.940	87.806			
24	.442	.885	88.690			
25	.418	.836	89.526			
26	.405	.810	90.336			
27	.387	.774	91.111			
28	.370	.740	91.851			
29	.342	.684	92.535			
30	.331	.661	93.196			
31	.283	.566	93.761			
32	.277	.554	94.315			

33	.262	.524	94.840			
34	.256	.512	95.352			
35	.249	.497	95.850			
36	.240	.480	96.330			
37	.225	.449	96.779			
38	.197	.394	97.173			
39	.175	.350	97.524			
40	.170	.339	97.863			
41	.161	.322	98.184			
42	.140	.280	98.465			
43	.137	.274	98.738			
44	.124	.249	98.987			
45	.105	.210	99.197			
46	.099	.198	99.395			
47	.098	.196	99.591			
48	.075	.149	99.740			
49	.069	.137	99.877			
50	.061	.123	100.000			

Extraction Method: Maximum Likelihood.

Factor Matrix[a]

a. 9 factors extracted. 15 iterations required.

Goodness-of-fit Test

Chi-Square	df	Sig.
1088.915	811	.000

Rotated Factor Matrix[a]

	Factor								
	1	2	3	4	5	6	7	8	9

Management encourages employees here to work in accordance with safety rules - even when the work schedule is tight	.694	.294	.254	.023	.194	.082	.003	.022	.060
Management ensures that everyone receives the necessary information on safety	.786	.259	.161	.108	.108	.025	.061	-.032	.002
Management looks the other way when someone is careless with safety	.360	.049	.481	.030	.069	-.009	.187	-.154	-.012
Management places safety before production	.394	.201	.166	-.023	.248	.154	.107	.124	.140
Management accepts employees here taking risks when the work schedule is tight	.379	.148	.573	.103	.144	.196	-.070	-.026	.051
We who work here have confidence in the management's ability to handle safety	.686	.347	.296	.057	.170	.125	.081	-.055	-.079
Management ensures that safety problems discovered during safety conversations / audits / inspections are corrected immediately	.674	.295	.144	.147	.105	.161	.037	-.081	.041
When a risk is detected, management ignores it without action	.578	.354	.349	.110	.129	.266	-.165	-.067	-.063
Management lacks the ability to handle safety properly	.664	.262	.275	.098	.187	.306	-.100	-.126	.081
Management strives to design safety routines that are meaningful and actually work	.610	.062	.202	.173	.124	-.023	.146	.226	.180
Management makes sure that each and everyone can influence safety in their work	.639	.142	.358	.165	.160	.010	.083	.298	-.014

Management encourages employees here to participate in decisions which affect their safety	.566	.139	.197	.137	.124	.224	.087	.412	.013
Management never considers employees' suggestions regarding safety suggestions regarding safety	.458	.170	.174	.132	.220	.358	.113	.033	.000
Management strives for everybody at the worksite to have high competence concerning safety and risks	.616	.234	.264	.251	.188	-.059	.162	.124	.210
Management never asks employees for their opinions before making decisions regarding safety	.368	.203	.216	.135	.156	.581	-.011	.024	.010
Management involves employees in decisions regarding safety regarding safety	.520	.408	.190	.114	.265	.243	.125	.078	.098
Management collects accurate information in accident investigations	.520	.368	.240	.090	.455	.062	.084	.080	-.117
Fear of sanctions (negative consequences) from management discourages employees here from reporting near-miss accidents	.231	.155	.344	.197	.317	.254	.170	.066	.117
Management listens carefully to all who have been involved in an accident event	.274	.319	.163	.076	.568	.025	-.063	-.029	.030
Management looks for causes, not guilty persons, when an accident occurs	.320	.237	.091	.062	.482	.163	.242	.053	.084
Management always blames employees for accidents	.408	.037	.387	.316	.459	.279	-.051	.020	.044
Management treats employees involved in an accident fairly	.467	.235	.233	.140	.448	.121	.047	.208	-.038

We who work here try hard together to achieve a high level of safety	.426	.541	.344	-.025	.045	.107	.099	.050	.223
We who work here take joint responsibility to ensure that the workplace is always kept tidy	.338	.524	.261	-.011	-.032	.217	.168	-.079	.061
We who work here do not care about each others' safety	.114	.124	.441	.147	.038	.125	.206	-.006	.024
We who work here avoid tackling risks that are discovered	.234	.177	.408	.016	.015	.107	.104	.101	.052
We who work here help each other to work safely	.285	.725	.296	.141	.137	.014	.009	.064	.106
We who work here take no responsibility for each others' safety	.216	.215	.456	.255	.225	.029	.026	-.020	-.033
We who work here regard risks as unavoidable	.058	.116	.360	.257	.043	.121	-.096	.136	-.033
We who work here consider minor accidents as a normal part of our daily work	.192	.194	.574	.125	.122	.176	.108	.170	.084
We who work here accept dangerous behaviour as long as there are no accidents	.372	.211	.656	.281	.203	-.151	-.017	-.105	.034
We who work here break safety rules in order to complete work on time	.222	.221	.773	.052	.213	.086	.079	.042	-.018
We who work here never accept risk-taking even if the work schedule is tight	.218	.142	.126	.045	.132	.258	.198	.165	.031
We who work here consider that our work is unsuitable for cowards	.101	.132	.475	.225	.056	-.015	-.161	.311	.090
We who work here accept risk-taking at work	.210	.227	.603	.342	.128	.049	-.061	.037	.109

We who work here try to find a solution if someone points out a safety problem	.363	.665	.171	.204	.183	.088	-.130	.123	.262
We who work here feel safe when working together	.191	.645	.269	.098	.285	.141	.141	.142	-.156
We who work here have great trust in each others' ability to ensure safety	.241	.734	.267	.024	.216	.203	.102	.009	-.042
We who work here learn from our experiences to prevent accidents	.243	.693	.206	.159	.167	.093	-.005	.017	.005
We who work here take each others' opinions and suggestions concerning safety seriously	.314	.726	.288	.222	.311	.066	-.084	.164	-.038
We who work here seldom talk about safety	.275	.102	.235	.364	.099	.094	.197	.194	-.032
We who work here always discuss safety issues when such issues come up	.343	.367	.233	.093	.493	.064	.047	.028	.575
We who work here can talk freely and openly about safety	.239	.454	.309	.110	.469	.123	-.013	.021	.248
We who work here consider that a good safety representative plays an important role in preventing accidents	.083	.533	.036	.316	.182	-.091	.078	-.082	.046
We who work here consider that safety conversations /audits / inspections have no effect on safety	.122	.294	.258	.572	.188	.189	.322	-.039	.028
We who work here consider that safety training is good for preventing accidents	.135	.632	.070	.426	-.001	.180	.207	.064	.117
We who work here consider early planning for safety as meaningless	.119	.291	.349	.696	.046	.162	.016	.114	.100

We who work here consider that safety conversations / audits / inspections help find serious hazards	.138	.472	.081	.223	.047	.021	.590	-.013	.005
We who work here consider that safety training is meaningless	.181	.285	.454	.705	.078	-.110	.053	-.035	-.058
We who work here consider that it is important that there are clear-cut goals for safety	.214	.661	.072	.180	.072	.021	.397	.060	.017

Extraction Method: Maximum Likelihood.

Rotation Method: Varimax with Kaiser Normalization.[a]

a. Rotation converged in 16 iterations.

Factor Transformation Matrix

Factor	1	2	3	4	5	6	7	8	
1	.536	.554	.433	.273	.314	.151	.075	.076	
2	.645	-.571	.044	-.429	.156	.144	-.139	-.012	
3	-.059	-.522	.591	.553	-.155	-.094	-.032	-.021	
4	.352	.156	-.131	-.034	-.518	.127	.162	-.010	
5	.258	-.214	-.506	.492	-.050	.014	.537	.078	
6	-.285	-.102	.290	-.305	.190	.421	.712	.013	
7	-.143	-.095	-.271	.293	.324	.683	-.366	.206	
8	-.015	.076	.119	.008	-.566	.534	-.132	-.379	
9	-.026	.009	.129	-.119	-.347	.050	-.036	.895	

NOSACQ-50 EFA - 7-Factor Extraction

```
FACTOR
 /VARIABLES SC1.1 SC1.2 SC1.3_r SC1.4 SC1.5_r SC1.6 SC1.7 SC1.8_r SC1.9_r SC2.1 SC2.2 SC2.3
   SC2.4_r SC2.5 SC2.6_r SC2.7 SC3.1 SC3.2_r SC3.3 SC3.4 SC3.5_r SC3.6 SC4.1 SC4.2 SC4.3_r SC4.4_r
   SC4.5 SC4.6_r SC5.1_r SC5.2_r SC5 3_r SC5.4_r SC5.5 SC5.6_r SC5.7_r SC6.1 SC6.2 SC6.3 SC6.4 SC6.5
   SC6.6_r SC6.7 SC6.8 SC7.1 SC7.2_r SC7.3 SC7.4_r SC7.5 SC7.6_r SC7.7
 /MISSING LISTWISE
 /ANALYSIS SC1.1 SC1.2 SC1.3_r SC1.4 SC1.5_r SC1.6 SC1.7 SC1.8_r SC1.9_r SC2.1 SC2.2 SC2.3 SC2.4_r
   SC2.5 SC2.6_r SC2.7 SC3.1 SC3.2_r SC3.3 SC3.4 SC3.5_r SC3.6 SC4.1 SC4.2 SC4.3_r SC4.4_r SC4.5
   SC4.6_r SC5.1_r SC5.2_r SC5.3_r SC5.4_r SC5.5 SC5.6_r SC5.7_r SC6.1 SC6.2 SC6.3 SC6.4 SC6.5 SC6.6_r
   SC6.7 SC6.8 SC7.1 SC7.2_r SC7.3 SC7.4_r SC7.5 SC7.6_r SC7.7
 /PRINT INITIAL KMO ROTATION
 /CRITERIA FACTORS(7) ITERATE(200)
 /EXTRACTION ML
 /CRITERIA ITERATE(200)
 /ROTATION VARIMAX.
```

Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.921
Bartlett's Test of Sphericity	Approx. Chi-Square	5919.759
	df	1225
	Sig.	.000

Communalities

	Initial
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Management places safety before production	.523
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When a risk is detected, management ignores it without action	.754
Management lacks the ability to handle safety properly	.821
Management strives to design safety routines that are meaningful and actually work	.709
Management makes sure that each and everyone can influence safety in their work	.785
Management encourages employees here to participate in decisions which affect their safety	.666
Management never considers employees' suggestions regarding safety suggestions regarding safety	.686
Management strives for everybody at the worksite to have high competence concerning safety and risks	.739
Management never asks employees for their opinions before making decisions regarding safety	.756
Management involves employees in decisions regarding safety regarding safety	.757
Management collects accurate information in accident investigations	.762
Fear of sanctions (negative consequences) from management discourages employees here from reporting near-miss accidents	.643
Management listens carefully to all who have been involved in an accident event	.677

Management looks for causes, not guilty persons, when an accident occurs	.613
Management always blames employees for accidents	.805
Management treats employees involved in an accident fairly	.695
We who work here try hard together to achieve a high level of safety	.756
We who work here take joint responsibility to ensure that the workplace is always kept tidy	.658
We who work here do not care about each others' safety	.513
We who work here avoid tackling risks that are discovered	.515
We who work here help each other to work safely	.809
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We who work here always discuss safety issues when such issues come up	.778
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We who work here consider that safety conversations /audits / inspections have no effect on safety	.730
We who work here consider that safety training is good for preventing accidents	.763
We who work here consider early planning for safety as meaningless	.780
We who work here consider that safety conversations / audits / inspections help find serious hazards	.647
We who work here consider that safety training is meaningless	.823
We who work here consider that it is important that there are clear-cut goals for safety	.780

Extraction Method: Maximum Likelihood.

Total Variance Explained

	Initial Eigenvalues			Rotation Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	21.235	42.470	42.470	7.944	15.887	15.887
2	2.811	5.622	48.092	7.062	14.124	30.011
3	2.560	5.119	53.212	5.890	11.780	41.791
4	1.558	3.116	56.328	2.947	5.895	47.686
5	1.399	2.799	59.127	2.575	5.151	52.836
6	1.308	2.615	61.742	1.453	2.906	55.742
7	1.234	2.468	64.210	1.255	2.510	58.252
8	1.163	2.327	66.536			
9	1.038	2.077	68.613			
10	.932	1.865	70.478			
11	.893	1.786	72.264			
12	.874	1.748	74.011			
13	.816	1.631	75.643			
14	.738	1.475	77.118			
15	.718	1.437	78.555			
16	.698	1.397	79.952			
17	.665	1.330	81.282			
18	.629	1.257	82.539			
19	.587	1.174	83.713			
20	.548	1.096	84.809			
21	.518	1.036	85.845			
22	.511	1.021	86.866			
23	.470	.940	87.806			
24	.442	.885	88.690			
25	.418	.836	89.526			
26	.405	.810	90.336			
27	.387	.774	91.111			
28	.370	.740	91.851			
29	.342	.684	92.535			
30	.331	.661	93.196			
31	.283	.566	93.761			
32	.277	.554	94.315			
33	.262	.524	94.840			
34	.256	.512	95.352			
35	.249	.497	95.850			
36	.240	.480	96.330			
37	.225	.449	96.779			
38	.197	.394	97.173			

39	.175	.350	97.524			
40	.170	.339	97.863			
41	.161	.322	98.184			
42	.140	.280	98.465			
43	.137	.274	98.738			
44	.124	.249	98.987			
45	.105	.210	99.197			
46	.099	.198	99.395			
47	.098	.196	99.591			
48	.075	.149	99.740			
49	.069	.137	99.877			
50	.061	.123	100.000			

Extraction Method: Maximum Likelihood.

Factor Matrix[a]

a. 7 factors extracted. 6 iterations required.

Goodness-of-fit Test

Chi-Square	df	Sig.
1275.860	896	.000

Rotated Factor Matrix[a]

	Factor						
	1	2	3	4	5	6	7
Management encourages employees here to work in accordance with safety rules - even when the work schedule is tight	.708	.294	.252	.207	.006	.045	.011
Management ensures that everyone receives the necessary information on safety	.800	.255	.166	.065	.095	.028	.062
Management looks the other way when someone is careless with safety	.364	.040	.472	.066	-.016	-.045	.227

Management places safety before production	.398	.197	.144	.331	-.007	.123	.109
Management accepts employees here taking risks when the work schedule is tight	.391	.147	.569	.146	.060	.190	-.035
We who work here have confidence in the management's ability to handle safety	.694	.350	.304	.073	.026	.169	.091
Management ensures that safety problems discovered during safety conversations / audits / inspections are corrected immediately	.678	.295	.151	.094	.131	.142	.031
When a risk is detected, management ignores it without action	.575	.347	.364	.098	.069	.251	-.112
Management lacks the ability to handle safety properly	.661	.258	.282	.196	.071	.264	-.079
Management strives to design safety routines that are meaningful and actually work	.605	.065	.191	.216	.197	-.041	.127
Management makes sure that each and everyone can influence safety in their work	.624	.150	.362	.202	.162	.019	.094
Management encourages employees here to participate in decisions which affect their safety	.559	.145	.186	.206	.164	.212	.087
Management never considers employees' suggestions regarding safety suggestions regarding safety	.466	.163	.172	.224	.131	.350	.124
Management strives for everybody at the worksite to have high competence concerning safety and risks	.617	.237	.263	.261	.262	-.080	.127
Management never asks employees for their opinions before making decisions regarding safety	.381	.195	.204	.147	.140	.628	-.005

Management involves employees in decisions regarding safety regarding safety	.524	.406	.183	.290	.118	.259	.116
Management collects accurate information in accident investigations	.514	.372	.278	.359	.065	.103	.090
Fear of sanctions (negative consequences) from management discourages employees here from reporting near-miss accidents	.237	.152	.347	.344	.196	.236	.174
Management listens carefully to all who have been involved in an accident event	.268	.330	.215	.506	.040	.044	-.087
Management looks for causes, not guilty persons, when an accident occurs	.315	.220	.093	.565	.068	.106	.252
Management always blames employees for accidents	.412	.039	.434	.429	.275	.267	-.041
Management treats employees involved in an accident fairly	.468	.241	.268	.408	.126	.138	.046
We who work here try hard together to achieve a high level of safety	.428	.530	.288	.190	-.002	.046	.103
We who work here take joint responsibility to ensure that the workplace is always kept tidy	.345	.519	.218	.016	-.010	.197	.166
We who work here do not care about each others' safety	.120	.117	.428	.060	.125	.119	.241
We who work here avoid tackling risks that are discovered	.240	.174	.376	.075	.007	.103	.117
We who work here help each other to work safely	.288	.723	.291	.190	.136	-.001	.013
We who work here take no responsibility for each others' safety	.219	.214	.484	.155	.217	.075	.031
We who work here regard risks as unavoidable	.061	.120	.380	.038	.235	.133	-.083
We who work here consider minor accidents as a normal part of our daily work	.209	.194	.552	.163	.117	.169	.126

We who work here accept dangerous behaviour as long as there are no accidents	.376	.222	.690	.103	.208	-.100	.002
We who work here break safety rules in order to complete work on time	.228	.224	.777	.196	-.011	.086	.128
We who work here never accept risk-taking even if the work schedule is tight	.220	.139	.106	.192	.069	.220	.200
We who work here consider that our work is unsuitable for cowards	.107	.133	.472	.153	.218	-.044	-.131
We who work here accept risk-taking at work	.221	.234	.624	.117	.303	.060	-.059
We who work here try to find a solution if someone points out a safety problem	.365	.660	.172	.300	.218	.036	-.137
We who work here feel safe when working together	.197	.645	.291	.196	.079	.184	.165
We who work here have great trust in each others' ability to ensure safety	.247	.744	.267	.145	.002	.256	.119
We who work here learn from our experiences to prevent accidents	.246	.697	.225	.133	.138	.110	.011
We who work here take each others' opinions and suggestions concerning safety seriously	.320	.719	.324	.264	.199	.103	-.051
We who work here seldom talk about safety	.280	.103	.248	.095	.369	.113	.192
We who work here always discuss safety issues when such issues come up	.364	.376	.225	.582	.124	.009	-.010
We who work here can talk freely and openly about safety	.251	.459	.323	.502	.099	.093	-.035
We who work here consider that a good safety representative plays an important role in preventing accidents	.078	.535	.080	.146	.296	-.098	.075

We who work here consider that safety conversations /audits / inspections have no effect on safety	.133	.285	.294	.171	.562	.163	.308
We who work here consider that safety training is good for preventing accidents	.142	.623	.070	.077	.448	.140	.186
We who work here consider early planning for safety as meaningless	.124	.290	.392	.090	.682	.121	.014
We who work here consider that safety conversations / audits / inspections help find serious hazards	.143	.468	.066	.048	.243	.007	.583
We who work here consider that safety training is meaningless	.180	.291	.525	-.001	.633	-.074	.050
We who work here consider that it is important that there are clear-cut goals for safety	.218	.650	.052	.128	.206	-.022	.423

Extraction Method: Maximum Likelihood.

Rotation Method: Varimax with Kaiser Normalization.[a]

a. Rotation converged in 13 iterations.

Factor Transformation Matrix

Factor	1	2	3	4	5	6	7
1	.550	.553	.454	.296	.253	.159	.096
2	.618	-.658	.160	.104	-.323	.120	-.176
3	-.282	-.402	.662	-.133	.539	-.112	-.028
4	.381	-.203	-.454	-.246	.562	-.044	.479
5	-.210	-.205	-.273	.777	.326	.333	-.132
6	-.216	-.101	.207	-.002	-.293	.548	.717
7	-.016	-.084	.082	.468	-.184	-.732	.444

Extraction Method: Maximum Likelihood.

Rotation Method: Varimax with Kaiser Normalization.

ALI EFA - Initial Extraction

```
FACTOR
 /VARIABLES AL1_R AL2_M AL3_B AL4_S AL5_M AL6_B AL7_S AL8_R AL9_M AL10_B AL11_S AL12_R AL13_M
  AL14_B
 /MISSING LISTWISE
 /ANALYSIS AL1_R AL2_M AL3_B AL4_S AL5_M AL6_B AL7_S AL8_R AL9_M AL10_B AL11_S AL12_R AL13_M AL14_B
 /PRINT INITIAL KMO ROTATION
 /CRITERIA MINEIGEN(1) ITERATE(200)
 /EXTRACTION ML
 /CRITERIA ITERATE(200)
 /ROTATION VARIMAX.
```

Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.951
Bartlett's Test of Sphericity	Approx. Chi-Square	2103.505
	df	91
	Sig.	.000

Communalities

	Initial
My leader clearly states what he/she means.	.818
My leader shows consistency between his/her beliefs and actions.	.849
My leader asks for ideas that challenge his/her core beliefs.	.625
My leader describes accurately the way that others view his/her abilities.	.668
My leader uses his/her core beliefs to make decisions.	.647
My leader carefully listens to alternative perspectives before reaching a conclusion.	.759
My leader shows that he/she understands his/her strengths and weaknesses.	.786
My leader openly shares information with others.	.756
My leader resists pressures on him/her to do things contrary to his/her beliefs.	.258

My leader objectively analyzes relevant data before making a decision.	.777
My leader is clearly aware of the impact he/she has on others.	.684
My leader expresses his/her ideas and thoughts clearly to others.	.867
My leader is guided in his/her actions by internal moral standards.	.639
My leader encourages others to voice opposing points of view.	.724

Extraction Method: Maximum Likelihood.

Total Variance Explained

	Initial Eigenvalues		
Factor	Total	% of Variance	Cumulative %
1	9.597	68.550	68.550
2	.839	5.992	74.543
3	.667	4.764	79.307
4	.446	3.183	82.491
5	.424	3.028	85.519
6	.380	2.712	88.231
7	.337	2.410	90.641
8	.277	1.982	92.622
9	.250	1.783	94.405
10	.232	1.657	96.062
11	.177	1.267	97.328
12	.174	1.244	98.572
13	.107	.765	99.338
14	.093	.662	100.000

Extraction Method: Maximum Likelihood.

Factor Matrix[a]

a. 1 factors extracted. 4 iterations required.

Goodness-of-fit Test

Chi-Square	df	Sig.
185.631	77	.000

Rotated Factor Matrix[a]

a. Only one factor was extracted. The solution cannot be rotated.

ALI EFA - 4-Factor Extraction

```
FACTOR
 /VARIABLES AL1_R AL2_M AL3_B AL4_S AL5_M AL6_B AL7_S AL8_R AL9_M AL10_B AL11_S AL12_R AL13_M
   AL14_B
 /MISSING LISTWISE
 /ANALYSIS AL1_R AL2_M AL3_B AL4_S AL5_M AL6_B AL7_S AL8_R AL9_M AL10_B AL11_S AL12_R AL13_M AL14_B
 /PRINT INITIAL KMO ROTATION
 /CRITERIA FACTORS(4) ITERATE(200)
 /EXTRACTION ML
 /CRITERIA ITERATE(200)
 /ROTATION VARIMAX.
```

Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.951
Bartlett's Test of Sphericity	Approx. Chi-Square	2103.505
	df	91
	Sig.	.000

Communalities[a]

	Initial
My leader clearly states what he/she means.	.818
My leader shows consistency between his/her beliefs and actions.	.849
My leader asks for ideas that challenge his/her core beliefs.	.625

My leader describes accurately the way that others view his/her abilities.	.668
My leader uses his/her core beliefs to make decisions.	.647
My leader carefully listens to alternative perspectives before reaching a conclusion.	.759
My leader shows that he/she understands his/her strengths and weaknesses.	.786
My leader openly shares information with others.	.756
My leader resists pressures on him/her to do things contrary to his/her beliefs.	.258
My leader objectively analyzes relevant data before making a decision.	.777
My leader is clearly aware of the impact he/she has on others.	.684
My leader expresses his/her ideas and thoughts clearly to others.	.867
My leader is guided in his/her actions by internal moral standards.	.639
My leader encourages others to voice opposing points of view.	.724

Extraction Method: Maximum Likelihood.[a]

a. One or more communalitiy estimates greater than 1 were encountered during iterations. The resulting solution should be interpreted with caution.

Total Variance Explained

	Initial Eigenvalues			Rotation Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.597	68.550	68.550	4.020	28.716	28.716
2	.839	5.992	74.543	2.563	18.309	47.026
3	.667	4.764	79.307	2.277	16.265	63.290
4	.446	3.183	82.491	1.604	11.454	74.744

5	.424	3.028	85.519			
6	.380	2.712	88.231			
7	.337	2.410	90.641			
8	.277	1.982	92.622			
9	.250	1.783	94.405			
10	.232	1.657	96.062			
11	.177	1.267	97.328			
12	.174	1.244	98.572			
13	.107	.765	99.338			
14	.093	.662	100.000			

Extraction Method: Maximum Likelihood.

Factor Matrix[a]

a. 4 factors extracted. 8 iterations required.

Goodness-of-fit Test

Chi-Square	df	Sig.
57.122	41	.048

Rotated Factor Matrix[a]

	Factor			
	1	2	3	4
My leader clearly states what he/she means.	.453	.357	.288	.764
My leader shows consistency between his/her beliefs and actions.	.493	.545	.299	.471
My leader asks for ideas that challenge his/her core beliefs.	.454	.299	.517	.185
My leader describes accurately the way that others view his/her abilities.	.265	.279	.901	.195
My leader uses his/her core beliefs to make decisions.	.487	.327	.485	.253

My leader carefully listens to alternative perspectives before reaching a conclusion.	.766	.230	.285	.334
My leader shows that he/she understands his/her strengths and weaknesses.	.661	.409	.372	.216
My leader openly shares information with others.	.648	.420	.249	.314
My leader resists pressures on him/her to do things contrary to his/her beliefs.	.143	.386	.203	.139
My leader objectively analyzes relevant data before making a decision.	.476	.710	.264	.250
My leader is clearly aware of the impact he/she has on others.	.533	.520	.320	.187
My leader expresses his/her ideas and thoughts clearly to others.	.597	.520	.302	.396
My leader is guided in his/her actions by internal moral standards.	.567	.355	.344	.243
My leader encourages others to voice opposing points of view.	.637	.383	.291	.270

Extraction Method: Maximum Likelihood.

Rotation Method: Varimax with Kaiser Normalization.[a]

a. Rotation converged in 6 iterations.

Factor Transformation Matrix

Factor	1	2	3	4
1	.405	.357	.654	.530
2	.221	.092	-.717	.654
3	.641	.496	-.231	-.539
4	.614	-.786	.067	-.022

Extraction Method: Maximum Likelihood.

Rotation Method: Varimax with Kaiser Normalization.

Appendix J

SPSS Outputs – Analysis of Variation

ALI ANOVA

Pre-Intervention / Post-Intervention Variance

Between-Subjects Factors

		Value Labe	N
Survey Year	1.00	2017	154
	2.00	2018	154

Descriptive Statistics

	Survey Year	Mean	Std. Deviation	N
ALI S	2017	3.9199	.89949	154
	2018	3.8463	.91079	154
	Total	3.8831	.90443	308
ALI_R	2017	4.0260	.96001	154
	2018	4.0671	1.01147	154
	Total	4.0465	.98468	308
ALI B	2017	3.8977	.91135	154
	2018	3.8864	.95447	154
	Total	3.8920	.93166	308
ALI_M	2017	3.9416	.81489	154
	2018	3.9156	.84898	154
	Total	3.9286	.83086	308

Box's Test of Equality of Covariance Matrices[a]

Box's M	8.405
F	.829
df1	10
df2	447662.151
Sig.	.601

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Survey_Year

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.958	1720.483[b]	4.000	303.000	.000	.958	6881.931	1.000
	Wilks' Lambda	.042	1720.483[b]	4.000	303.000	.000	.958	6881.931	1.000
	Hotelling's Trace	22.713	1720.483[b]	4.000	303.000	.000	.958	6881.931	1.000
	Roy's Largest Root	22.713	1720.483[b]	4.000	303.000	.000	.958	6881.931	1.000
Survey_Year	Pillai's Trace	.014	1.037[b]	4.000	303.000	.388	.014	4.148	.326
	Wilks' Lambda	.986	1.037[b]	4.000	303.000	.388	.014	4.148	.326
	Hotelling's Trace	.014	1.037[b]	4.000	303.000	.388	.014	4.148	.326
	Roy's Largest Root	.014	1.037[b]	4.000	303.000	.388	.014	4.148	.326

a. Design: Intercept + Survey_Year

b. Exact statistic

c. Computed using alpha = .05

a

Levene's Test of Equality of Error Variances

	Levene Statistic		df1	df2	Sig.
ALI_S	Based on Mean	.330	1	306	.566
	Based on Median	.140	1	306	.709
	Based on Median and with adjusted df	.140	1	305.997	.709
	Based on trimmed mean	.374	1	306	.541
ALI_R	Based on Mean	.011	1	306	.915
	Based on Median	.001	1	306	.978
	Based on Median and with adjusted df	.001	1	304.193	.978
	Based on trimmed mean	.003	1	306	.953
ALI_B	Based on Mean	.074	1	306	.786
	Based on Median	.066	1	306	.798
	Based on Median and with adjusted df	.066	1	304.198	.798
	Based on trimmed mean	.058	1	306	.810
ALI_M	Based on Mean	.090	1	306	.764
	Based on Median	.024	1	306	.877
	Based on Median and with adjusted df	.024	1	304.095	.877
	Based on trimmed mean	.043	1	306	.836

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Survey_Year

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[e]
Corrected Model	ALI S	.417[a]	1	.417	.509	.476	.002	.509	.110
	ALI R	.130[b]	1	.130	.134	.715	.000	.134	.065
	ALI B	.010[c]	1	.010	.011	.915	.000	.011	.051
	ALI M	.052[d]	1	.052	.075	.784	.000	.075	.059
Intercept	ALI S	4644.208	1	4644.208	5668.446	.000	.949	5668.446	1.000
	ALI R	5043.334	1	5043.334	5186.800	.000	.944	5186.800	1.000
	ALI B	4665.589	1	4665.589	5357.855	.000	.946	5357.855	1.000
	ALI M	4753.571	1	4753.571	6865.282	.000	.957	6865.282	1.000
Survey_Year	ALI S	.417	1	.417	.509	.476	.002	.509	.110
	ALI R	.130	1	.130	.134	.715	.000	.134	.065
	ALI B	.010	1	.010	.011	.915	.000	.011	.051
	ALI M	.052	1	.052	.075	.784	.000	.075	.059
Error	ALI S	250.709	306	.819					
	ALI R	297.536	306	.972					
	ALI B	266.463	306	.871					
	ALI M	211.877	306	.692					
Total	ALI S	4895.333	308						
	ALI R	5341.000	308						
	ALI B	4932.063	308						
	ALI M	4965.500	308						
Corrected Total	ALI S	251.126	307						
	ALI R	297.666	307						
	ALI B	266.473	307						
	ALI M	211.929	307						

a. R Squared = .002 (Adjusted R Squared = -.002)

b. R Squared = .000 (Adjusted R Squared = -.003)

c. R Squared = .000 (Adjusted R Squared = -.003)

d. R Squared = .000 (Adjusted R Squared = -.003)

e. Computed using alpha = .05

Variance with Gender

Between-Subjects Factors

		Value Labe	N
Survey Year	1.00	2017	154
	2.00	2018	154

Box's Test of Equality of Covariance Matrices[a]

Box's M	8.405
F	.829
df1	10
df2	447662.151
Sig.	.601

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Gender + Survey_Year

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.736	210.829[b]	4.000	302.000	.000	.736	843.318	1.000
	Wilks' Lambda	.264	210.829[b]	4.000	302.000	.000	.736	843.318	1.000
	Hotelling's Trace	2.792	210.829[b]	4.000	302.000	.000	.736	843.318	1.000
	Roy's Largest Root	2.792	210.829[b]	4.000	302.000	.000	.736	843.318	1.000
Gender	Pillai's Trace	.047	3.708[b]	4.000	302.000	.006	.047	14.830	.882
	Wilks' Lambda	.953	3.708[b]	4.000	302.000	.006	.047	14.830	.882
	Hotelling's Trace	.049	3.708[b]	4.000	302.000	.006	.047	14.830	.882
	Roy's Largest Root	.049	3.708[b]	4.000	302.000	.006	.047	14.830	.882
Survey_Year	Pillai's Trace	.014	1.066[b]	4.000	302.000	.373	.014	4.265	.335
	Wilks' Lambda	.986	1.066[b]	4.000	302.000	.373	.014	4.265	.335
	Hotelling's Trace	.014	1.066[b]	4.000	302.000	.373	.014	4.265	.335
	Roy's Largest Root	.014	1.066[b]	4.000	302.000	.373	.014	4.265	.335

a. Design: Intercept + Gender + Survey_Year

b. Exact statistic

c. Computed using alpha = .05

Levene's Test of Equality of Error Variances[a]

	F	df1	df2	Sig.
ALI_S	.079	1	306	.778
ALI_R	.071	1	306	.790
ALI_B	.053	1	306	.817
ALI_M	.057	1	306	.812

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Gender + Survey_Year

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[e]
Corrected Model	ALI_S	6.163[a]	2	3.082	3.837	.023	.025	7.673	.694
	ALI_R	4.245[b]	2	2.123	2.206	.112	.014	4.413	.449
	ALI_B	4.233[c]	2	2.117	2.462	.087	.016	4.924	.493
	ALI_M	.611[d]	2	.306	.441	.644	.003	.882	.122
Intercept	ALI_S	504.127	1	504.127	627.683	.000	.673	627.683	1.000
	ALI_R	568.116	1	568.116	590.535	.000	.659	590.535	1.000
	ALI_B	521.131	1	521.131	606.105	.000	.665	606.105	1.000
	ALI_M	589.474	1	589.474	850.804	.000	.736	850.804	1.000
Gender	ALI_S	5.746	1	5.746	7.154	.008	.023	7.154	.760
	ALI_R	4.115	1	4.115	4.278	.039	.014	4.278	.541
	ALI_B	4.223	1	4.223	4.912	.027	.016	4.912	.598
	ALI_M	.559	1	.559	.807	.370	.003	.807	.146
Survey_Year	ALI_S	.500	1	.500	.623	.431	.002	.623	.123
	ALI_R	.095	1	.095	.099	.753	.000	.099	.061
	ALI_B	.023	1	.023	.027	.869	.000	.027	.053
	ALI_M	.061	1	.061	.088	.767	.000	.088	.060
Error	ALI_S	244.963	305	.803					
	ALI_R	293.421	305	.962					
	ALI_B	262.240	305	.860					
	ALI_M	211.318	305	.693					
Total	ALI_S	4895.333	308						
	ALI_R	5341.000	308						
	ALI_B	4932.063	308						
	ALI_M	4965.500	308						
Corrected Total	ALI_S	251.126	307						
	ALI_R	297.666	307						
	ALI_B	266.473	307						
	ALI_M	211.929	307						

a. R Squared = .025 (Adjusted R Squared = .018)

b. R Squared = .014 (Adjusted R Squared = .008)

c. R Squared = .016 (Adjusted R Squared = .009)

d. R Squared = .003 (Adjusted R Squared = -.004)

e. Computed using alpha = .05

Variance with Role Type

Between-Subjects Factors

		Value Labe	N
Survey Year	1.00	2017	154
	2.00	2018	154

Box's Test of Equality of Covariance Matrices[a]

Box's M	8.405
F	.829
df1	10
df2	447662.151
Sig.	.601

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + RoleType + Survey_Year

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.529	84.743[b]	4.000	302.000	.000	.529	338.971	1.000
	Wilks' Lambda	.471	84.743[b]	4.000	302.000	.000	.529	338.971	1.000
	Hotelling's Trace	1.122	84.743[b]	4.000	302.000	.000	.529	338.971	1.000
	Roy's Largest Root	1.122	84.743[b]	4.000	302.000	.000	.529	338.971	1.000
RoleType	Pillai's Trace	.047	3.751[b]	4.000	302.000	.005	.047	15.002	.886
	Wilks' Lambda	.953	3.751[b]	4.000	302.000	.005	.047	15.002	.886
	Hotelling's Trace	.050	3.751[b]	4.000	302.000	.005	.047	15.002	.886
	Roy's Largest Root	.050	3.751[b]	4.000	302.000	.005	.047	15.002	.886

Survey_Year	Pillai's Trace	.013	.995[b]	4.000	302.000	.411	.013	3.980	.314
	Wilks' Lambda	.987	.995[b]	4.000	302.000	.411	.013	3.980	.314
	Hotelling's Trace	.013	.995[b]	4.000	302.000	.411	.013	3.980	.314
	Roy's Largest Root	.013	.995[b]	4.000	302.000	.411	.013	3.980	.314

a. Design: Intercept + RoleType + Survey_Year

b. Exact statistic

c. Computed using alpha = .05

Levene's Test of Equality of Error Variances[a]

	F	df1	df2	Sig.
ALI_S	.198	1	306	.656
ALI_R	.002	1	306	.968
ALI_B	.065	1	306	.799
ALI_M	.123	1	306	.726

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + RoleType + Survey_Year

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[e]
Corrected Model	ALI_S	8.251[a]	2	4.126	5.181	.006	.033	10.362	.826
	ALI_R	7.541[b]	2	3.771	3.964	.020	.025	7.928	.709
	ALI_B	10.496[c]	2	5.248	6.253	.002	.039	12.506	.893
	ALI_M	8.433[d]	2	4.217	6.320	.002	.040	12.640	.897
Intercept	ALI_S	221.495	1	221.495	278.152	.000	.477	278.152	1.000
	ALI_R	246.393	1	246.393	259.025	.000	.459	259.025	1.000
	ALI_B	210.217	1	210.217	250.475	.000	.451	250.475	1.000
	ALI_M	224.874	1	224.874	337.042	.000	.525	337.042	1.000
RoleType	ALI_S	7.834	1	7.834	9.838	.002	.031	9.838	.878
	ALI_R	7.411	1	7.411	7.791	.006	.025	7.791	.795
	ALI_B	10.486	1	10.486	12.494	.000	.039	12.494	.941
	ALI_M	8.381	1	8.381	12.562	.000	.040	12.562	.942
Survey_Year	ALI_S	.216	1	.216	.272	.603	.001	.272	.081
	ALI_R	.286	1	.286	.300	.584	.001	.300	.085
	ALI_B	.012	1	.012	.014	.906	.000	.014	.052
	ALI_M	.002	1	.002	.003	.959	.000	.003	.050
Error	ALI_S	242.874	305	.796					
	ALI_R	290.125	305	.951					
	ALI_B	255.977	305	.839					
	ALI_M	203.495	305	.667					
Total	ALI_S	4895.333	308						

	ALI R	5341.000	308						
	ALI B	4932.063	308						
	ALI M	4965.500	308						
Corrected Total	ALI S	251.126	307						
	ALI R	297.666	307						
	ALI B	266.473	307						
	ALI M	211.929	307						

a. R Squared = .033 (Adjusted R Squared = .027)

b. R Squared = .025 (Adjusted R Squared = .019)

c. R Squared = .039 (Adjusted R Squared = .033)

d. R Squared = .040 (Adjusted R Squared = .033)

e. Computed using alpha = .05

Variance with Employment Status

Between-Subjects Factors

		Value Labe	N
Survey Year	1.00	2017	154
	2.00	2018	154

Box's Test of Equality of Covariance Matrices[a]

Box's M	8.405
F	.829
df1	10
df2	447662.151
Sig.	.601

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + EmploymentStatus + Survey_Year

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.733	207.540[b]	4.000	302.000	.000	.733	830.161	1.000

	Wilks' Lambda	.267	207.540[b]	4.000	302.000	.000	.733	830.161	1.000
	Hotelling's Trace	2.749	207.540[b]	4.000	302.000	.000	.733	830.161	1.000
	Roy's Largest Root	2.749	207.540[b]	4.000	302.000	.000	.733	830.161	1.000
EmploymentStatus	Pillai's Trace	.032	2.514[b]	4.000	302.000	.042	.032	10.057	.711
	Wilks' Lambda	.968	2.514[b]	4.000	302.000	.042	.032	10.057	.711
	Hotelling's Trace	.033	2.514[b]	4.000	302.000	.042	.032	10.057	.711
	Roy's Largest Root	.033	2.514[b]	4.000	302.000	.042	.032	10.057	.711
Survey_Year	Pillai's Trace	.013	1.017[b]	4.000	302.000	.399	.013	4.068	.320
	Wilks' Lambda	.987	1.017[b]	4.000	302.000	.399	.013	4.068	.320
	Hotelling's Trace	.013	1.017[b]	4.000	302.000	.399	.013	4.068	.320
	Roy's Largest Root	.013	1.017[b]	4.000	302.000	.399	.013	4.068	.320

a. Design: Intercept + EmploymentStatus + Survey_Year

b. Exact statistic

c. Computed using alpha = .05

Levene's Test of Equality of Error Variances[a]

	F	df1	df2	Sig.
ALI_S	.343	1	306	.559
ALI_R	.027	1	306	.869
ALI_B	.107	1	306	.744
ALI_M	.057	1	306	.812

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + EmploymentStatus + Survey_Year

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[e]
Corrected Model	ALI_S	.590[a]	2	.295	.359	.699	.002	.718	.107
	ALI_R	1.511[b]	2	.755	.778	.460	.005	1.556	.182
	ALI_B	.164[c]	2	.082	.094	.910	.001	.188	.064
	ALI_M	.245[d]	2	.123	.177	.838	.001	.354	.077
Intercept	ALI_S	524.502	1	524.502	638.525	.000	.677	638.525	1.000
	ALI_R	536.806	1	536.806	552.837	.000	.644	552.837	1.000
	ALI_B	527.966	1	527.966	604.672	.000	.665	604.672	1.000
	ALI_M	574.990	1	574.990	828.464	.000	.731	828.464	1.000
EmploymentStatus	ALI_S	.173	1	.173	.211	.647	.001	.211	.074
	ALI_R	1.380	1	1.380	1.422	.234	.005	1.422	.221
	ALI_B	.154	1	.154	.177	.675	.001	.177	.070
	ALI_M	.193	1	.193	.279	.598	.001	.279	.082
Survey_Year	ALI_S	.426	1	.426	.518	.472	.002	.518	.111

	ALI R	.117	1	.117	.120	.729	.000	.120	.064
	ALI B	.011	1	.011	.013	.910	.000	.013	.051
	ALI M	.049	1	.049	.070	.791	.000	.070	.058
Error	ALI S	250.536	305	.821					
	ALI R	296.156	305	.971					
	ALI B	266.309	305	.873					
	ALI M	211.683	305	.694					
Total	ALI S	4895.333	308						
	ALI R	5341.000	308						
	ALI B	4932.063	308						
	ALI M	4965.500	308						
Corrected Total	ALI S	251.126	307						
	ALI R	297.666	307						
	ALI B	266.473	307						
	ALI M	211.929	307						

a. R Squared = .002 (Adjusted R Squared = -.004)

b. R Squared = .005 (Adjusted R Squared = -.001)

c. R Squared = .001 (Adjusted R Squared = -.006)

d. R Squared = .001 (Adjusted R Squared = -.005)

e. Computed using alpha = .05

Variance with People Leader

Between-Subjects Factors

		Value Labe	N
Survey Year	1.00	2017	154
	2.00	2018	154

Box's Test of Equality of Covariance Matrices[a]

Box's M	8.405
F	.829
df1	10
df2	447662.151
Sig.	.601

Tests the null hypothesis that the observed covariance

matrices of the
dependent variables are
equal across groups.

a. Design: Intercept + Leader + Survey_Year

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.734	208.576[b]	4.000	302.000	.000	.734	834.303	1.000
	Wilks' Lambda	.266	208.576[b]	4.000	302.000	.000	.734	834.303	1.000
	Hotelling's Trace	2.763	208.576[b]	4.000	302.000	.000	.734	834.303	1.000
	Roy's Largest Root	2.763	208.576[b]	4.000	302.000	.000	.734	834.303	1.000
Leader	Pillai's Trace	.046	3.643[b]	4.000	302.000	.006	.046	14.572	.875
	Wilks' Lambda	.954	3.643[b]	4.000	302.000	.006	.046	14.572	.875
	Hotelling's Trace	.048	3.643[b]	4.000	302.000	.006	.046	14.572	.875
	Roy's Largest Root	.048	3.643[b]	4.000	302.000	.006	.046	14.572	.875
Survey_Year	Pillai's Trace	.014	1.067[b]	4.000	302.000	.373	.014	4.268	.335
	Wilks' Lambda	.986	1.067[b]	4.000	302.000	.373	.014	4.268	.335
	Hotelling's Trace	.014	1.067[b]	4.000	302.000	.373	.014	4.268	.335
	Roy's Largest Root	.014	1.067[b]	4.000	302.000	.373	.014	4.268	.335

a. Design: Intercept + Leader + Survey_Year

b. Exact statistic

c. Computed using alpha = .05

Levene's Test of Equality of Error Variances[a]

	F	df1	df2	Sig.
ALI_S	.229	1	306	.633
ALI_R	.044	1	306	.834
ALI_B	.002	1	306	.962
ALI_M	.158	1	306	.691

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Leader + Survey_Year

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[e]
Corrected Model	ALI_S	3.440[a]	2	1.720	2.118	.122	.014	4.236	.433
	ALI_R	4.916[b]	2	2.458	2.561	.079	.017	5.122	.510
	ALI_B	6.928[c]	2	3.464	4.071	.018	.026	8.141	.721
	ALI_M	6.342[d]	2	3.171	4.705	.010	.030	9.409	.786
Intercept	ALI_S	516.445	1	516.445	635.949	.000	.676	635.949	1.000
	ALI_R	577.885	1	577.885	602.065	.000	.664	602.065	1.000

	ALI B	557.988	1	557.988	655.710	.000	.683	655.710	1.000
	ALI M	561.870	1	561.870	833.569	.000	.732	833.569	1.000
Leader	ALI S	3.023	1	3.023	3.722	.055	.012	3.722	.485
	ALI R	4.786	1	4.786	4.986	.026	.016	4.986	.605
	ALI B	6.918	1	6.918	8.130	.005	.026	8.130	.811
	ALI M	6.290	1	6.290	9.332	.002	.030	9.332	.861
Survey_Year	ALI S	.307	1	.307	.378	.539	.001	.378	.094
	ALI R	.225	1	.225	.234	.629	.001	.234	.077
	ALI B	.001	1	.001	.002	.968	.000	.002	.050
	ALI M	.009	1	.009	.014	.906	.000	.014	.052
Error	ALI S	247.686	305	.812					
	ALI R	292.750	305	.960					
	ALI B	259.545	305	.851					
	ALI M	205.586	305	.674					
Total	ALI S	4895.333	308						
	ALI R	5341.000	308						
	ALI B	4932.063	308						
	ALI M	4965.500	308						
Corrected Total	ALI S	251.126	307						
	ALI R	297.666	307						
	ALI B	266.473	307						
	ALI M	211.929	307						

a. R Squared = .014 (Adjusted R Squared = .007)

b. R Squared = .017 (Adjusted R Squared = .010)

c. R Squared = .026 (Adjusted R Squared = .020)

d. R Squared = .030 (Adjusted R Squared = .024)

e. Computed using alpha = .05

Variance with Leader Role

Between-Subjects Factors

		Value Label	N
Survey Year	1.00	2017	76
	2.00	2018	68

Box's Test of Equality of Covariance Matrices[a]

Box's M	18.089
N	1.754

df1	10
df2	93698.494
Sig.	.063

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Leader_Role + Survey_Year

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.792	131.479[b]	4.000	138.000	.000	.792	525.915	1.000
	Wilks' Lambda	.208	131.479[b]	4.000	138.000	.000	.792	525.915	1.000
	Hotelling's Trace	3.811	131.479[b]	4.000	138.000	.000	.792	525.915	1.000
	Roy's Largest Root	3.811	131.479[b]	4.000	138.000	.000	.792	525.915	1.000
Leader Role	Pillai's Trace	.090	3.399[b]	4.000	138.000	.011	.090	13.597	.841
	Wilks' Lambda	.910	3.399[b]	4.000	138.000	.011	.090	13.597	.841
	Hotelling's Trace	.099	3.399[b]	4.000	138.000	.011	.090	13.597	.841
	Roy's Largest Root	.099	3.399[b]	4.000	138.000	.011	.090	13.597	.841
Survey Year	Pillai's Trace	.062	2.291[b]	4.000	138.000	.063	.062	9.165	.655
	Wilks' Lambda	.938	2.291[b]	4.000	138.000	.063	.062	9.165	.655
	Hotelling's Trace	.066	2.291[b]	4.000	138.000	.063	.062	9.165	.655
	Roy's Largest Root	.066	2.291[b]	4.000	138.000	.063	.062	9.165	.655

a. Design: Intercept + Leader_Role + Survey_Year

b. Exact statistic

c. Computed using alpha = .05

Levene's Test of Equality of Error Variances[a]

	F	df1	df2	Sig.
ALI S	.504	1	142	.479
ALI R	.491	1	142	.485
ALI B	.112	1	142	.738
ALI M	1.149	1	142	.286

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Leader_Role + Survey_Year

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[e]
Corrected Model	ALI S	1.105[a]	2	.553	1.019	.364	.014	2.038	.225
	ALI R	2.045[b]	2	1.023	1.486	.230	.021	2.971	.313

	ALI B	3.248[c]	2	1.624	2.894	.059	.039	5.789	.558
	ALI M	4.225[d]	2	2.113	4.663	.011	.062	9.326	.777
Intercept	ALI S	199.784	1	199.784	368.528	.000	.723	368.528	1.000
	ALI R	228.759	1	228.759	332.366	.000	.702	332.366	1.000
	ALI B	220.557	1	220.557	393.097	.000	.736	393.097	1.000
	ALI M	237.543	1	237.543	524.332	.000	.788	524.332	1.000
Leader_Role	ALI S	1.075	1	1.075	1.983	.161	.014	1.983	.288
	ALI R	2.028	1	2.028	2.946	.088	.020	2.946	.399
	ALI B	2.418	1	2.418	4.309	.040	.030	4.309	.541
	ALI M	4.217	1	4.217	9.308	.003	.062	9.308	.858
Survey_Year	ALI S	.065	1	.065	.120	.729	.001	.120	.064
	ALI R	.060	1	.060	.087	.769	.001	.087	.060
	ALI B	.615	1	.615	1.096	.297	.008	1.096	.180
	ALI M	.065	1	.065	.143	.705	.001	.143	.066
Error	ALI S	76.438	141	.542					
	ALI R	97.047	141	.688					
	ALI B	79.112	141	.561					
	ALI M	63.878	141	.453					
Total	ALI S	2370.889	144						
	ALI R	2613.000	144						
	ALI B	2446.750	144						
	ALI M	2467.063	144						
Corrected Total	ALI S	77.543	143						
	ALI R	99.092	143						
	ALI B	82.359	143						
	ALI M	68.104	143						

a. R Squared = .014 (Adjusted R Squared = .000)

b. R Squared = .021 (Adjusted R Squared = .007)

c. R Squared = .039 (Adjusted R Squared = .026)

d. R Squared = .062 (Adjusted R Squared = .049)

e. Computed using alpha = .05

Variance with Workgroup

Between-Subjects Factors

		Value Labe	N
Survey Year	1.00	2017	154
	2.00	2018	154

Box's Test of Equality of

Covariance

Matrices[a]

Box's M	8.405
F	.829
df1	10
df2	447662.151
Sig.	.601

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Contract_BusinessGroup + Survey_Year

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter
Intercept	Pillai's Trace	.840	394.963[b]	4.000	302.000	.000	.840	1579.854
	Wilks' Lambda	.160	394.963[b]	4.000	302.000	.000	.840	1579.854
	Hotelling's Trace	5.231	394.963[b]	4.000	302.000	.000	.840	1579.854
	Roy's Largest Root	5.231	394.963[b]	4.000	302.000	.000	.840	1579.854
Contract BusinessGroup	Pillai's Trace	.016	1.200[b]	4.000	302.000	.311	.016	4.800
	Wilks' Lambda	.984	1.200[b]	4.000	302.000	.311	.016	4.800
	Hotelling's Trace	.016	1.200[b]	4.000	302.000	.311	.016	4.800
	Roy's Largest Root	.016	1.200[b]	4.000	302.000	.311	.016	4.800
Survey Year	Pillai's Trace	.014	1.067[b]	4.000	302.000	.373	.014	4.266
	Wilks' Lambda	.986	1.067[b]	4.000	302.000	.373	.014	4.266
	Hotelling's Trace	.014	1.067[b]	4.000	302.000	.373	.014	4.266
	Roy's Largest Root	.014	1.067[b]	4.000	302.000	.373	.014	4.266

Multivariate Tests[a]

Effect		Observed Power[c]
Intercept	Pillai's Trace	1.000
	Wilks' Lambda	1.000
	Hotelling's Trace	1.000
	Roy's Largest Root	1.000
Contract_BusinessGroup	Pillai's Trace	.375

	Wilks' Lambda	.375
	Hotelling's Trace	.375
	Roy's Largest Root	.375
Survey_Year	Pillai's Trace	.335
	Wilks' Lambda	.335
	Hotelling's Trace	.335
	Roy's Largest Root	.335

a. Design: Intercept + Contract_BusinessGroup + Survey_Year

b. Exact statistic

c. Computed using alpha = .05

Levene's Test of Equality of Error Variances[a]

	F	df1	df2	Sig.
ALI_S	.386	1	306	.535
ALI_R	.023	1	306	.879
ALI_B	.004	1	306	.948
ALI_M	.149	1	306	.699

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Contract_BusinessGroup + Survey_Year

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter
Corrected Model	ALI_S	4.001[a]	2	2.001	2.469	.086	.016	4.938
	ALI_R	3.888[b]	2	1.944	2.018	.135	.013	4.037
	ALI_B	3.843[c]	2	1.921	2.231	.109	.014	4.463
	ALI_M	3.008[d]	2	1.504	2.196	.113	.014	4.391
Intercept	ALI_S	1045.123	1	1045.123	1289.886	.000	.809	1289.886
	ALI_R	1136.946	1	1136.946	1180.375	.000	.795	1180.375
	ALI_B	1046.551	1	1046.551	1215.390	.000	.799	1215.390
	ALI_M	1080.880	1	1080.880	1577.959	.000	.838	1577.959
Contract_BusinessGroup	ALI_S	3.584	1	3.584	4.423	.036	.014	4.423
	ALI_R	3.758	1	3.758	3.901	.049	.013	3.901
	ALI_B	3.833	1	3.833	4.451	.036	.014	4.451
	ALI_M	2.956	1	2.956	4.315	.039	.014	4.315
Survey_Year	ALI_S	.625	1	.625	.771	.380	.003	.771
	ALI_R	.044	1	.044	.046	.831	.000	.046
	ALI_B	.063	1	.063	.073	.787	.000	.073

	ALI_M	.130	1	.130	.190	.663	.001	.190
Error	ALI_S	247.124	305	.810				
	ALI_R	293.778	305	.963				
	ALI_B	262.630	305	.861				
	ALI_M	208.921	305	.685				
Total	ALI_S	4895.333	308					
	ALI_R	5341.000	308					
	ALI_B	4932.063	308					
	ALI_M	4965.500	308					
Corrected Total	ALI_S	251.126	307					
	ALI_R	297.666	307					
	ALI_B	266.473	307					
	ALI_M	211.929	307					

Tests of Between-Subjects Effects

Source	Dependent Variable	Observed Power[e]
Corrected Model	ALI_S	.494
	ALI_R	.415
	ALI_B	.453
	ALI_M	.447
Intercept	ALI_S	1.000
	ALI_R	1.000
	ALI_B	1.000
	ALI_M	1.000
Contract_BusinessGroup	ALI_S	.554
	ALI_R	.504
	ALI_B	.557
	ALI_M	.544
Survey_Year	ALI_S	.141
	ALI_R	.055
	ALI_B	.058
	ALI_M	.072

Error	ALI_S	
	ALI R	
	ALI B	
	ALI M	
Total	ALI S	
	ALI R	
	ALI_B	
	ALI_M	
Corrected Total	ALI_S	
	ALI_R	
	ALI_B	
	ALI M	

a. R Squared = .016 (Adjusted R Squared = .009)

b. R Squared = .013 (Adjusted R Squared = .007)

c. R Squared = .014 (Adjusted R Squared = .008)

d. R Squared = .014 (Adjusted R Squared = .008)

e. Computed using alpha = .05

Variance with Length of Service

Between-Subjects Factors

		Value Labe	N
Survey Year	1.00	2017	154
	2.00	2018	154

Box's Test of Equality of Covariance Matrices[a]

Box's M	8.405
F	.829
df1	10
df2	447662.151

Sig.	.601

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + LengthService + Survey_Year

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.813	328.809[b]	4.000	302.000	.000	.813	1315.235	1.000
	Wilks' Lambda	.187	328.809[b]	4.000	302.000	.000	.813	1315.235	1.000
	Hotelling's Trace	4.355	328.809[b]	4.000	302.000	.000	.813	1315.235	1.000
	Roy's Largest Root	4.355	328.809[b]	4.000	302.000	.000	.813	1315.235	1.000
LengthService	Pillai's Trace	.025	1.908[b]	4.000	302.000	.109	.025	7.632	.574
	Wilks' Lambda	.975	1.908[b]	4.000	302.000	.109	.025	7.632	.574
	Hotelling's Trace	.025	1.908[b]	4.000	302.000	.109	.025	7.632	.574
	Roy's Largest Root	.025	1.908[b]	4.000	302.000	.109	.025	7.632	.574
Survey_Year	Pillai's Trace	.012	.937[b]	4.000	302.000	.443	.012	3.747	.296
	Wilks' Lambda	.988	.937[b]	4.000	302.000	.443	.012	3.747	.296
	Hotelling's Trace	.012	.937[b]	4.000	302.000	.443	.012	3.747	.296
	Roy's Largest Root	.012	.937[b]	4.000	302.000	.443	.012	3.747	.296

a. Design: Intercept + LengthService + Survey_Year

b. Exact statistic

c. Computed using alpha = .05

Levene's Test of Equality of Error Variances[a]

	F	df1	df2	Sig.
ALI S	.482	1	306	.488
ALI R	.003	1	306	.958
ALI B	.098	1	306	.755
ALI M	.118	1	306	.731

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + LengthService + Survey_Year

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[e]
Corrected Model	ALI S	4.113[a]	2	2.057	2.539	.081	.016	5.079	.506
	ALI R	6.646[b]	2	3.323	3.482	.032	.022	6.965	.649
	ALI B	4.145[c]	2	2.073	2.410	.092	.016	4.819	.484

	ALI M	2.087[d]	2	1.043	1.517	.221	.010	3.033	.322
Intercept	ALI S	900.264	1	900.264	1111.606	.000	.785	1111.606	1.000
	ALI R	1009.132	1	1009.132	1057.607	.000	.776	1057.607	1.000
	ALI B	910.251	1	910.251	1058.319	.000	.776	1058.319	1.000
	ALI M	893.039	1	893.039	1298.010	.000	.810	1298.010	1.000
LengthService	ALI S	3.696	1	3.696	4.564	.033	.015	4.564	.567
	ALI R	6.516	1	6.516	6.829	.009	.022	6.829	.741
	ALI B	4.135	1	4.135	4.808	.029	.016	4.808	.589
	ALI M	2.035	1	2.035	2.958	.086	.010	2.958	.403
Survey_Year	ALI S	.937	1	.937	1.157	.283	.004	1.157	.189
	ALI R	.007	1	.007	.008	.930	.000	.008	.051
	ALI B	.202	1	.202	.235	.628	.001	.235	.077
	ALI M	.222	1	.222	.322	.571	.001	.322	.087
Error	ALI S	247.012	305	.810					
	ALI R	291.021	305	.954					
	ALI B	262.328	305	.860					
	ALI M	209.842	305	.688					
Total	ALI S	4895.333	308						
	ALI R	5341.000	308						
	ALI B	4932.063	308						
	ALI M	4965.500	308						
Corrected Total	ALI S	251.126	307						
	ALI R	297.666	307						
	ALI B	266.473	307						
	ALI M	211.929	307						

a. R Squared = .016 (Adjusted R Squared = .010)

b. R Squared = .022 (Adjusted R Squared = .016)

c. R Squared = .016 (Adjusted R Squared = .009)

d. R Squared = .010 (Adjusted R Squared = .003)

e. Computed using alpha = .05

Variance with Age

Between-Subjects Factors

		Value Labe	N
Survey Year	1.00	2017	154
	2.00	2018	154

Box's Test of Equality of Covariance

Matrices[a]

Box's M	8.405
F	.829
df1	10
df2	447662.151
Sig.	.601

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Age + Survey_Year

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.601	113.690[b]	4.000	302.000	.000	.601	454.760	1.000
	Wilks' Lambda	.399	113.690[b]	4.000	302.000	.000	.601	454.760	1.000
	Hotelling's Trace	1.506	113.690[b]	4.000	302.000	.000	.601	454.760	1.000
	Roy's Largest Root	1.506	113.690[b]	4.000	302.000	.000	.601	454.760	1.000
Age	Pillai's Trace	.029	2.231[b]	4.000	302.000	.066	.029	8.925	.651
	Wilks' Lambda	.971	2.231[b]	4.000	302.000	.066	.029	8.925	.651
	Hotelling's Trace	.030	2.231[b]	4.000	302.000	.066	.029	8.925	.651
	Roy's Largest Root	.030	2.231[b]	4.000	302.000	.066	.029	8.925	.651
Survey_Year	Pillai's Trace	.014	1.103[b]	4.000	302.000	.355	.014	4.413	.346
	Wilks' Lambda	.986	1.103[b]	4.000	302.000	.355	.014	4.413	.346
	Hotelling's Trace	.015	1.103[b]	4.000	302.000	.355	.014	4.413	.346
	Roy's Largest Root	.015	1.103[b]	4.000	302.000	.355	.014	4.413	.346

a. Design: Intercept + Age + Survey_Year

b. Exact statistic

c. Computed using alpha = .05

Levene's Test of Equality of Error Variances[a]

	F	df1	df2	Sig.
ALI S	.254	1	306	.615
ALI R	.007	1	306	.932
ALI B	.108	1	306	.743
ALI M	.196	1	306	.658

Tests the null hypothesis that the error variance of the

dependent variable is equal across groups.

a. Design: Intercept + Age + Survey_Year

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[e]
Corrected Model	ALI S	3.517[a]	2	1.758	2.166	.116	.014	4.332	.442
	ALI R	3.095[b]	2	1.547	1.602	.203	.010	3.204	.338
	ALI B	1.040[c]	2	.520	.598	.551	.004	1.195	.149
	ALI M	3.328[d]	2	1.664	2.433	.089	.016	4.866	.488
Intercept	ALI S	299.733	1	299.733	369.206	.000	.548	369.206	1.000
	ALI R	321.539	1	321.539	332.922	.000	.522	332.922	1.000
	ALI B	276.323	1	276.323	317.513	.000	.510	317.513	1.000
	ALI M	307.775	1	307.775	450.005	.000	.596	450.005	1.000
Age	ALI S	3.100	1	3.100	3.818	.052	.012	3.818	.495
	ALI R	2.965	1	2.965	3.070	.081	.010	3.070	.416
	ALI B	1.030	1	1.030	1.184	.277	.004	1.184	.192
	ALI M	3.276	1	3.276	4.790	.029	.015	4.790	.588
Survey_Year	ALI S	.566	1	.566	.698	.404	.002	.698	.132
	ALI R	.065	1	.065	.067	.796	.000	.067	.058
	ALI B	.026	1	.026	.030	.862	.000	.030	.053
	ALI M	.115	1	.115	.168	.683	.001	.168	.069
Error	ALI S	247.609	305	.812					
	ALI R	294.571	305	.966					
	ALI B	265.433	305	.870					
	ALI M	208.600	305	.684					
Total	ALI S	4895.333	308						
	ALI R	5341.000	308						
	ALI B	4932.063	308						
	ALI M	4965.500	308						
Corrected Total	ALI S	251.126	307						
	ALI R	297.666	307						
	ALI B	266.473	307						
	ALI M	211.929	307						

a. R Squared = .014 (Adjusted R Squared = .008)

b. R Squared = .010 (Adjusted R Squared = .004)

c. R Squared = .004 (Adjusted R Squared = -.003)

d. R Squared = .016 (Adjusted R Squared = .009)

e. Computed using alpha = .05

Variance with NOSACQ-50 Dimensions

Between-Subjects Factors

		Value Label	N
Survey Year	1.00	2017	154
	2.00	2018	154

Box's Test of Equality of Covariance Matrices[a]

Box's M	8.405
F	.829
df1	10
df2	447662.151
Sig.	.601

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + NOSACQ_Dim1 + NOSACQ_Dim2 + NOSACQ_Dim3 + NOSACQ_Dim4 + NOSACQ_Dim5 + NOSACQ_Dim6 + NOSACQ_Dim7 + Survey_Year

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.051	4.005[b]	4.000	296.000	.004	.051	16.020	.907
	Wilks' Lambda	.949	4.005[b]	4.000	296.000	.004	.051	16.020	.907
	Hotelling's Trace	.054	4.005[b]	4.000	296.000	.004	.051	16.020	.907
	Roy's Largest Root	.054	4.005[b]	4.000	296.000	.004	.051	16.020	.907
NOSACQ_Dim1	Pillai's Trace	.043	3.345[b]	4.000	296.000	.011	.043	13.379	.842
	Wilks' Lambda	.957	3.345[b]	4.000	296.000	.011	.043	13.379	.842
	Hotelling's Trace	.045	3.345[b]	4.000	296.000	.011	.043	13.379	.842
	Roy's Largest Root	.045	3.345[b]	4.000	296.000	.011	.043	13.379	.842
NOSACQ_Dim2	Pillai's Trace	.052	4.087[b]	4.000	296.000	.003	.052	16.349	.914
	Wilks' Lambda	.948	4.087[b]	4.000	296.000	.003	.052	16.349	.914
	Hotelling's Trace	.055	4.087[b]	4.000	296.000	.003	.052	16.349	.914
	Roy's Largest Root	.055	4.087[b]	4.000	296.000	.003	.052	16.349	.914
NOSACQ_Dim3	Pillai's Trace	.033	2.549[b]	4.000	296.000	.039	.033	10.196	.718
	Wilks' Lambda	.967	2.549[b]	4.000	296.000	.039	.033	10.196	.718
	Hotelling's Trace	.034	2.549[b]	4.000	296.000	.039	.033	10.196	.718
	Roy's Largest Root	.034	2.549[b]	4.000	296.000	.039	.033	10.196	.718

NOSACQ_Dim4	Pillai's Trace	.011	.842[b]	4.000	296.000	.500	.011	3.367	.268
	Wilks' Lambda	.989	.842[b]	4.000	296.000	.500	.011	3.367	.268
	Hotelling's Trace	.011	.842[b]	4.000	296.000	.500	.011	3.367	.268
	Roy's Largest Root	.011	.842[b]	4.000	296.000	.500	.011	3.367	.268
NOSACQ_Dim5	Pillai's Trace	.004	.297[b]	4.000	296.000	.880	.004	1.189	.116
	Wilks' Lambda	.996	.297[b]	4.000	296.000	.880	.004	1.189	.116
	Hotelling's Trace	.004	.297[b]	4.000	296.000	.880	.004	1.189	.116
	Roy's Largest Root	.004	.297[b]	4.000	296.000	.880	.004	1.189	.116
NOSACQ_Dim6	Pillai's Trace	.025	1.930[b]	4.000	296.000	.105	.025	7.721	.579
	Wilks' Lambda	.975	1.930[b]	4.000	296.000	.105	.025	7.721	.579
	Hotelling's Trace	.026	1.930[b]	4.000	296.000	.105	.025	7.721	.579
	Roy's Largest Root	.026	1.930[b]	4.000	296.000	.105	.025	7.721	.579

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
NOSACQ_Dim7	Pillai's Trace	.022	1.666[b]	4.000	296.000	.158	.022	6.664	.510
	Wilks' Lambda	.978	1.666[b]	4.000	296.000	.158	.022	6.664	.510
	Hotelling's Trace	.023	1.666[b]	4.000	296.000	.158	.022	6.664	.510
	Roy's Largest Root	.023	1.666[b]	4.000	296.000	.158	.022	6.664	.510
Survey_Year	Pillai's Trace	.015	1.092[b]	4.000	296.000	.361	.015	4.369	.343
	Wilks' Lambda	.985	1.092[b]	4.000	296.000	.361	.015	4.369	.343
	Hotelling's Trace	.015	1.092[b]	4.000	296.000	.361	.015	4.369	.343
	Roy's Largest Root	.015	1.092[b]	4.000	296.000	.361	.015	4.369	.343

a. Design: Intercept + NOSACQ_Dim1 + NOSACQ_Dim2 + NOSACQ_Dim3 + NOSACQ_Dim4 + NOSACQ_Dim5 + NOSACQ_Dim6 + NOSACQ_Dim7 + Survey_Year

b. Exact statistic

c. Computed using alpha = .05

Levene's Test of Equality of Error Variances[a]

	F	df1	df2	Sig.
ALI_S	.965	1	306	.327
ALI_R	.372	1	306	.542
ALI_B	.572	1	306	.450
ALI_M	3.708	1	306	.055

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + NOSACQ_Dim1 + NOSACQ_Dim2 + NOSACQ_Dim3 + NOSACQ_Dim4 + NOSACQ_Dim5 + NOSACQ_Dim6 + NOSACQ_Dim7 + Survey_Year

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[e]
Corrected Model	ALI_S	102.856[a]	8	12.857	25.928	.000	.410	207.420	1.000
	ALI_R	137.381[b]	8	17.173	32.034	.000	.462	256.273	1.000
	ALI_B	116.048[c]	8	14.506	28.833	.000	.435	230.667	1.000
	ALI_M	88.028[d]	8	11.004	26.554	.000	.415	212.433	1.000
Intercept	ALI_S	1.031	1	1.031	2.079	.150	.007	2.079	.301
	ALI_R	.004	1	.004	.007	.933	.000	.007	.051
	ALI_B	.186	1	.186	.370	.543	.001	.370	.093
	ALI_M	2.821	1	2.821	6.808	.010	.022	6.808	.739
NOSACQ_Dim1	ALI_S	3.896	1	3.896	7.856	.005	.026	7.856	.798
	ALI_R	7.121	1	7.121	13.283	.000	.043	13.283	.953
	ALI_B	4.736	1	4.736	9.413	.002	.031	9.413	.864
	ALI_M	3.576	1	3.576	8.631	.004	.028	8.631	.834
NOSACQ_Dim2	ALI_S	4.331	1	4.331	8.735	.003	.028	8.735	.838
	ALI_R	2.125	1	2.125	3.965	.047	.013	3.965	.510
	ALI_B	5.528	1	5.528	10.988	.001	.035	10.988	.911
	ALI_M	5.090	1	5.090	12.284	.001	.039	12.284	.937
NOSACQ_Dim3	ALI_S	2.654	1	2.654	5.353	.021	.018	5.353	.635
	ALI_R	5.121	1	5.121	9.552	.002	.031	9.552	.869
	ALI_B	2.060	1	2.060	4.094	.044	.014	4.094	.523
	ALI_M	2.339	1	2.339	5.644	.018	.019	5.644	.658
NOSACQ_Dim4	ALI_S	.265	1	.265	.534	.465	.002	.534	.113
	ALI_R	.107	1	.107	.199	.656	.001	.199	.073
	ALI_B	.798	1	.798	1.586	.209	.005	1.586	.241
	ALI_M	.608	1	.608	1.467	.227	.005	1.467	.227
NOSACQ_Dim5	ALI_S	.002	1	.002	.005	.944	.000	.005	.051
	ALI_R	.014	1	.014	.027	.870	.000	.027	.053

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[e]
	ALI_B	.056	1	.056	.112	.738	.000	.112	.063
	ALI_M	.077	1	.077	.186	.667	.001	.186	.071
NOSACQ_Dim6	ALI_S	2.553	1	2.553	5.148	.024	.017	5.148	.619
	ALI_R	2.975	1	2.975	5.550	.019	.018	5.550	.651
	ALI_B	3.025	1	3.025	6.012	.015	.020	6.012	.686
	ALI_M	.746	1	.746	1.800	.181	.006	1.800	.267

NOSACQ_Dim7	ALI_S	2.357	1	2.357	4.753	.030	.016	4.753	.584
	ALI R	1.865	1	1.865	3.479	.063	.012	3.479	.460
	ALI B	1.805	1	1.805	3.589	.059	.012	3.589	.471
	ALI M	.343	1	.343	.828	.364	.003	.828	.148
Survey Year	ALI S	1.329	1	1.329	2.680	.103	.009	2.680	.372
	ALI R	.076	1	.076	.141	.707	.000	.141	.066
	ALI_B	.370	1	.370	.735	.392	.002	.735	.137
	ALI_M	.351	1	.351	.847	.358	.003	.847	.151
Error	ALI_S	148.269	299	.496					
	ALI_R	160.285	299	.536					
	ALI_B	150.426	299	.503					
	ALI_M	123.900	299	.414					
Total	ALI_S	4895.333	308						
	ALI_R	5341.000	308						
	ALI B	4932.063	308						
	ALI M	4965.500	308						
Corrected Total	ALI S	251.126	307						
	ALI_R	297.666	307						
	ALI_B	266.473	307						
	ALI_M	211.929	307						

a. R Squared = .410 (Adjusted R Squared = .394)

b. R Squared = .462 (Adjusted R Squared = .447)

c. R Squared = .435 (Adjusted R Squared = .420)

d. R Squared = .415 (Adjusted R Squared = .400)

e. Computed using alpha = .05

Variance with NOSACQ-50 Mean

Between-Subjects Factors

		Value Labe	N
Survey Year	1.00	2017	154

	2.00	2018	154

Box's Test of Equality of Covariance Matrices[a]

Box's M	8.405
F	.829
df1	10
df2	447662.151
Sig.	.601

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + NOSACQ_Mean + Survey_Year

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.052	4.168[b]	4.000	302.000	.003	.052	16.671	.919
	Wilks' Lambda	.948	4.168[b]	4.000	302.000	.003	.052	16.671	.919
	Hotelling's Trace	.055	4.168[b]	4.000	302.000	.003	.052	16.671	.919
	Roy's Largest Root	.055	4.168[b]	4.000	302.000	.003	.052	16.671	.919
NOSACQ_Mean	Pillai's Trace	.411	52.676[b]	4.000	302.000	.000	.411	210.704	1.000
	Wilks' Lambda	.589	52.676[b]	4.000	302.000	.000	.411	210.704	1.000
	Hotelling's Trace	.698	52.676[b]	4.000	302.000	.000	.411	210.704	1.000
	Roy's Largest Root	.698	52.676[b]	4.000	302.000	.000	.411	210.704	1.000
Survey_Year	Pillai's Trace	.014	1.079[b]	4.000	302.000	.367	.014	4.315	.339
	Wilks' Lambda	.986	1.079[b]	4.000	302.000	.367	.014	4.315	.339
	Hotelling's Trace	.014	1.079[b]	4.000	302.000	.367	.014	4.315	.339
	Roy's Largest Root	.014	1.079[b]	4.000	302.000	.367	.014	4.315	.339

a. Design: Intercept + NOSACQ_Mean + Survey_Year

b. Exact statistic

c. Computed using alpha = .05

Levene's Test of Equality of Error Variances[a]

F	df1	df2	Sig.

ALI S	.813	1	306	.368
ALI R	.278	1	306	.599
ALI B	.730	1	306	.394
ALI M	2.504	1	306	.115

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + NOSACQ_Mean + Survey_Year

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[e]
Corrected Model	ALI S	85.447[a]	2	42.724	78.651	.000	.340	157.301	1.000
	ALI R	117.604[b]	2	58.802	99.602	.000	.395	199.204	1.000
	ALI B	97.429[c]	2	48.714	87.893	.000	.366	175.787	1.000
	ALI M	72.409[d]	2	36.204	79.146	.000	.342	158.291	1.000
Intercept	ALI S	.022	1	.022	.040	.842	.000	.040	.055
	ALI R	1.881	1	1.881	3.186	.075	.010	3.186	.428
	ALI B	.592	1	.592	1.068	.302	.003	1.068	.178
	ALI M	.445	1	.445	.973	.325	.003	.973	.166
NOSACQ_Mean	ALI S	85.030	1	85.030	156.533	.000	.339	156.533	1.000
	ALI R	117.474	1	117.474	198.983	.000	.395	198.983	1.000
	ALI B	97.419	1	97.419	175.769	.000	.366	175.769	1.000
	ALI M	72.357	1	72.357	158.178	.000	.342	158.178	1.000
Survey Year	ALI S	1.026	1	1.026	1.888	.170	.006	1.888	.278
	ALI R	.005	1	.005	.009	.926	.000	.009	.051
	ALI B	.243	1	.243	.439	.508	.001	.439	.101
	ALI M	.321	1	.321	.702	.403	.002	.702	.133
Error	ALI S	165.678	305	.543					
	ALI R	180.063	305	.590					
	ALI B	169.044	305	.554					
	ALI M	139.520	305	.457					
Total	ALI S	4895.333	308						
	ALI R	5341.000	308						
	ALI B	4932.063	308						
	ALI M	4965.500	308						
Corrected Total	ALI S	251.126	307						
	ALI R	297.666	307						
	ALI B	266.473	307						
	ALI M	211.929	307						

a. R Squared = .340 (Adjusted R Squared = .336)

b. R Squared = .395 (Adjusted R Squared = .391)

c. R Squared = .366 (Adjusted R Squared = .361)

d. R Squared = .342 (Adjusted R Squared = .337)

e. Computed using alpha = .0

NOSACQ-50 ANOVA

Pre-Intervention / Post-Intervention

Between-Subjects Factors

		Value Label	N
Survey Year	1.00	2017	156
	2.00	2018	155

Descriptive Statistics

	Survey Year	Mean	Std. Deviation	N
NOSACQ_Dim1	2017	3.2642	.56095	156
	2018	3.3505	.54890	155
	Total	3.3073	.55577	311
NOSACQ Dim2	2017	3.2280	.52802	156
	2018	3.2470	.53311	155
	Total	3.2375	.52979	311
NOSACQ_Dim3	2017	3.1870	.57528	156
	2018	3.2183	.53808	155
	Total	3.2026	.55637	311
NOSACQ Dim4	2017	3.2468	.48581	156
	2018	3.3172	.45536	155
	Total	3.2819	.47144	311
NOSACQ_Dim5	2017	3.1932	.46970	156
	2018	3.2461	.50219	155
	Total	3.2196	.48610	311
NOSACQ Dim6	2017	3.2989	.50012	156
	2018	3.3218	.49469	155
	Total	3.3103	.49675	311
NOSACQ_Dim7	2017	3.3672	.47091	156
	2018	3.3419	.47450	155
	Total	3.3546	.47211	311
NOSACQ Mean	2017	3.2550	.43945	156
	2018	3.2918	.43378	155
	Total	3.2734	.43632	311

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.984	2662.763[b]	7.000	303.000	.000	.984	18639.340	1.000
	Wilks' Lambda	.016	2662.763[b]	7.000	303.000	.000	.984	18639.340	1.000
	Hotelling's Trace	61.516	2662.763[b]	7.000	303.000	.000	.984	18639.340	1.000
	Roy's Largest Root	61.516	2662.763[b]	7.000	303.000	.000	.984	18639.340	1.000

Survey Year	Pillai's Trace	.026	1.177[b]	7.000	303.000	.316	.026	8.239	.505
	Wilks' Lambda	.974	1.177[b]	7.000	303.000	.316	.026	8.239	.505
	Hotelling's Trace	.027	1.177[b]	7.000	303.000	.316	.026	8.239	.505
	Roy's Largest Root	.027	1.177[b]	7.000	303.000	.316	.026	8.239	.505

a. Design: Intercept + Survey_Year

b. Exact statistic

c. Computed using alpha = .05

Levene's Test of Equality of Error Variances

		Levene Statistic	df1	df2	Sig.
NOSACQ_Dim1	Based on Mean	.054	1	309	.817
	Based on Median	.061	1	309	.806
	Based on Median and with adjusted df	.061	1	308.998	.806
	Based on trimmed mean	.049	1	309	.825
NOSACQ_Dim2	Based on Mean	.087	1	309	.768
	Based on Median	.211	1	309	.647
	Based on Median and with adjusted df	.211	1	307.378	.647
	Based on trimmed mean	.054	1	309	.816
NOSACQ_Dim3	Based on Mean	.275	1	309	.601
	Based on Median	.234	1	309	.629
	Based on Median and with adjusted df	.234	1	306.754	.629
	Based on trimmed mean	.436	1	309	.510
NOSACQ_Dim4	Based on Mean	.083	1	309	.774
	Based on Median	.024	1	309	.878
	Based on Median and with adjusted df	.024	1	308.191	.878
	Based on trimmed mean	.107	1	309	.744
NOSACQ_Dim5	Based on Mean	1.867	1	309	.173
	Based on Median	2.143	1	309	.144
	Based on Median and with adjusted df	2.143	1	308.419	.144
	Based on trimmed mean	1.726	1	309	.190
NOSACQ_Dim6	Based on Mean	.065	1	309	.798
	Based on Median	.033	1	309	.855
	Based on Median and with adjusted df	.033	1	308.323	.855
	Based on trimmed mean	.065	1	309	.799
NOSACQ_Dim7	Based on Mean	.437	1	309	.509
	Based on Median	.321	1	309	.572
	Based on Median and with	.321	1	305.514	.572

	adjusted df				
	Based on trimmed mean	.418	1	309	.519
NOSACQ_Mean	Based on Mean	.030	1	309	.863
	Based on Median	.030	1	309	.863
	Based on Median and with adjusted df	.030	1	308.956	.863
	Based on trimmed mean	.030	1	309	.864

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Survey_Year

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[i]
Corrected Model	NOSACQ_Dim1	.579[a]	1	.579	1.880	.171	.006	1.880	.277
	NOSACQ_Dim2	.028[b]	1	.028	.100	.753	.000	.100	.061
	NOSACQ_Dim3	.076[c]	1	.076	.246	.620	.001	.246	.078
	NOSACQ_Dim4	.385[d]	1	.385	1.738	.188	.006	1.738	.260
	NOSACQ_Dim5	.217[e]	1	.217	.919	.338	.003	.919	.159
	NOSACQ_Dim6	.041[f]	1	.041	.165	.685	.001	.165	.069
	NOSACQ_Dim7	.050[g]	1	.050	.222	.638	.001	.222	.076
	NOSACQ_Mean	.105[h]	1	.105	.552	.458	.002	.552	.115
Intercept	NOSACQ_Dim1	3401.943	1	3401.943	11045.216	.000	.973	11045.216	1.000
	NOSACQ_Dim2	3259.710	1	3259.710	11579.828	.000	.974	11579.828	1.000
	NOSACQ_Dim3	3189.829	1	3189.829	10279.692	.000	.971	10279.692	1.000
	NOSACQ_Dim4	3349.908	1	3349.908	15108.260	.000	.980	15108.260	1.000
	NOSACQ_Dim5	3223.845	1	3223.845	13639.730	.000	.978	13639.730	1.000
	NOSACQ_Dim6	3407.983	1	3407.983	13773.896	.000	.978	13773.896	1.000
	NOSACQ_Dim7	3499.702	1	3499.702	15662.306	.000	.981	15662.306	1.000
	NOSACQ_Mean	3332.458	1	3332.458	17479.460	.000	.983	17479.460	1.000
Survey_Year	NOSACQ_Dim1	.579	1	.579	1.880	.171	.006	1.880	.277
	NOSACQ_Dim2	.028	1	.028	.100	.753	.000	.100	.061
	NOSACQ_Dim3	.076	1	.076	.246	.620	.001	.246	.078
	NOSACQ_Dim4	.385	1	.385	1.738	.188	.006	1.738	.260
	NOSACQ_Dim5	.217	1	.217	.919	.338	.003	.919	.159
	NOSACQ_Dim6	.041	1	.041	.165	.685	.001	.165	.069
	NOSACQ_Dim7	.050	1	.050	.222	.638	.001	.222	.076
	NOSACQ_Mean	.105	1	.105	.552	.458	.002	.552	.115
Error	NOSACQ_Dim1	95.172	309	.308					
	NOSACQ_Dim2	86.983	309	.281					
	NOSACQ_Dim3	95.884	309	.310					
	NOSACQ_Dim4	68.514	309	.222					
	NOSACQ_Dim5	73.034	309	.236					

	NOSACQ_Dim6	76.454	309	.247
	NOSACQ_Dim7	69.045	309	.223
	NOSACQ_Mean	58.911	309	.191
Total	NOSACQ_Dim1	3497.444	311	
	NOSACQ_Dim2	3346.694	311	
	NOSACQ_Dim3	3285.722	311	
	NOSACQ_Dim4	3418.611	311	
	NOSACQ_Dim5	3296.959	311	
	NOSACQ_Dim6	3484.438	311	
	NOSACQ_Dim7	3568.918	311	
	NOSACQ_Mean	3391.389	311	
Corrected Total	NOSACQ_Dim1	95.751	310	
	NOSACQ_Dim2	87.011	310	
	NOSACQ_Dim3	95.960	310	
	NOSACQ_Dim4	68.899	310	
	NOSACQ_Dim5	73.252	310	
	NOSACQ_Dim6	76.495	310	
	NOSACQ_Dim7	69.095	310	
	NOSACQ_Mean	59.016	310	

a. R Squared = .006 (Adjusted R Squared = .003)

b. R Squared = .000 (Adjusted R Squared = -.003)

c. R Squared = .001 (Adjusted R Squared = -.002)

d. R Squared = .006 (Adjusted R Squared = .002)

e. R Squared = .003 (Adjusted R Squared = .000)

f. R Squared = .001 (Adjusted R Squared = -.003)

g. R Squared = .001 (Adjusted R Squared = -.003)

h. R Squared = .002 (Adjusted R Squared = -.001)

i. Computed using alpha = .05

Variance with Gender

Between-Subjects Factors

		Value Label	N
Survey Year	1.00	2017	156
	2.00	2018	155

Box's Test of Equality of Covariance Matrices[a]

Box's M	64.116

F	2.235
df1	28
df2	332681.845
Sig.	.000

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Gender + Survey_Year

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.889	345.031[b]	7.000	302.000	.000	.889	2415.214	1.000
	Wilks' Lambda	.111	345.031[b]	7.000	302.000	.000	.889	2415.214	1.000
	Hotelling's Trace	7.997	345.031[b]	7.000	302.000	.000	.889	2415.214	1.000
	Roy's Largest Root	7.997	345.031[b]	7.000	302.000	.000	.889	2415.214	1.000
Gender	Pillai's Trace	.021	.905[b]	7.000	302.000	.503	.021	6.336	.390
	Wilks' Lambda	.979	.905[b]	7.000	302.000	.503	.021	6.336	.390
	Hotelling's Trace	.021	.905[b]	7.000	302.000	.503	.021	6.336	.390
	Roy's Largest Root	.021	.905[b]	7.000	302.000	.503	.021	6.336	.390
Survey_Year	Pillai's Trace	.026	1.154[b]	7.000	302.000	.329	.026	8.081	.496
	Wilks' Lambda	.974	1.154[b]	7.000	302.000	.329	.026	8.081	.496
	Hotelling's Trace	.027	1.154[b]	7.000	302.000	.329	.026	8.081	.496
	Roy's Largest Root	.027	1.154[b]	7.000	302.000	.329	.026	8.081	.496

a. Design: Intercept + Gender + Survey_Year

b. Exact statistic

c. Computed using alpha = .05

a

Levene's Test of Equality of Error Variances

	F	df1	df2	Sig.
NOSACQ_Dim1	.149	1	309	.700
NOSACQ_Dim2	.050	1	309	.823
NOSACQ_Dim3	.328	1	309	.567
NOSACQ_Dim4	.090	1	309	.764
NOSACQ_Dim5	1.538	1	309	.216
NOSACQ_Dim6	.032	1	309	.858

NOSACQ_Dim7	.437	1	309	.509

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Gender + Survey_Year

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[h]
Corrected Model	NOSACQ_Dim1	1.236[a]	2	.618	2.013	.135	.013	4.026	.414
	NOSACQ_Dim2	.348[b]	2	.174	.619	.539	.004	1.237	.153
	NOSACQ_Dim3	.832[c]	2	.416	1.347	.262	.009	2.694	.290
	NOSACQ_Dim4	.865[d]	2	.433	1.959	.143	.013	3.918	.404
	NOSACQ_Dim5	.478[e]	2	.239	1.012	.365	.007	2.024	.226
	NOSACQ_Dim6	.408[f]	2	.204	.825	.439	.005	1.651	.191
	NOSACQ_Dim7	.050[g]	2	.025	.111	.895	.001	.222	.067
Intercept	NOSACQ_Dim1	423.902	1	423.902	1381.376	.000	.818	1381.376	1.000
	NOSACQ_Dim2	414.752	1	414.752	1474.028	.000	.827	1474.028	1.000
	NOSACQ_Dim3	394.330	1	394.330	1276.741	.000	.806	1276.741	1.000
	NOSACQ_Dim4	421.662	1	421.662	1908.936	.000	.861	1908.936	1.000
	NOSACQ_Dim5	412.143	1	412.143	1744.324	.000	.850	1744.324	1.000
	NOSACQ_Dim6	432.559	1	432.559	1751.006	.000	.850	1751.006	1.000
	NOSACQ_Dim7	468.948	1	468.948	2091.907	.000	.872	2091.907	1.000
Gender	NOSACQ_Dim1	.657	1	.657	2.140	.145	.007	2.140	.308
	NOSACQ_Dim2	.320	1	.320	1.138	.287	.004	1.138	.186
	NOSACQ_Dim3	.756	1	.756	2.448	.119	.008	2.448	.345
	NOSACQ_Dim4	.480	1	.480	2.173	.142	.007	2.173	.312
	NOSACQ_Dim5	.261	1	.261	1.105	.294	.004	1.105	.182
	NOSACQ_Dim6	.367	1	.367	1.486	.224	.005	1.486	.229
	NOSACQ_Dim7	6.929E-5	1	6.929E-5	.000	.986	.000	.000	.050
Survey_Year	NOSACQ_Dim1	.553	1	.553	1.804	.180	.006	1.804	.268
	NOSACQ_Dim2	.024	1	.024	.086	.769	.000	.086	.060
	NOSACQ_Dim3	.067	1	.067	.216	.643	.001	.216	.075
	NOSACQ_Dim4	.368	1	.368	1.665	.198	.005	1.665	.251
	NOSACQ_Dim5	.207	1	.207	.878	.350	.003	.878	.154
	NOSACQ_Dim6	.036	1	.036	.145	.704	.000	.145	.067
	NOSACQ_Dim7	.050	1	.050	.221	.638	.001	.221	.076
Error	NOSACQ_Dim1	94.516	308	.307					
	NOSACQ_Dim2	86.663	308	.281					
	NOSACQ_Dim3	95.128	308	.309					
	NOSACQ_Dim4	68.034	308	.221					
	NOSACQ_Dim5	72.773	308	.236					
	NOSACQ_Dim6	76.087	308	.247					
	NOSACQ_Dim7	69.045	308	.224					

Total	NOSACQ_Dim1	3497.444	311
	NOSACQ_Dim2	3346.694	311
	NOSACQ_Dim3	3285.722	311
	NOSACQ_Dim4	3418.611	311
	NOSACQ_Dim5	3296.959	311
	NOSACQ_Dim6	3484.438	311
	NOSACQ_Dim7	3568.918	311
Corrected Total	NOSACQ_Dim1	95.751	310
	NOSACQ_Dim2	87.011	310
	NOSACQ_Dim3	95.960	310
	NOSACQ_Dim4	68.899	310
	NOSACQ_Dim5	73.252	310
	NOSACQ_Dim6	76.495	310
	NOSACQ_Dim7	69.095	310

a. R Squared = .013 (Adjusted R Squared = .006)

b. R Squared = .004 (Adjusted R Squared = -.002)

c. R Squared = .009 (Adjusted R Squared = .002)

d. R Squared = .013 (Adjusted R Squared = .006)

e. R Squared = .007 (Adjusted R Squared = .000)

f. R Squared = .005 (Adjusted R Squared = -.001)

g. R Squared = .001 (Adjusted R Squared = -.006)

h. Computed using alpha = .05

Variance with Role Type

Between-Subjects Factors

		Value Labe	N
Survey Year	1.00	2017	156
	2.00	2018	155

Box's Test of Equality of Covariance Matrices[a]

Box's M	64.116
F	2.235
df1	28
df2	332681.845
Sig.	.000

Tests the null hypothesis that the

observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + RoleType + Survey_Year

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.779	151.920[b]	7.000	302.000	.000	.779	1063.442	1.000
	Wilks' Lambda	.221	151.920[b]	7.000	302.000	.000	.779	1063.442	1.000
	Hotelling's Trace	3.521	151.920[b]	7.000	302.000	.000	.779	1063.442	1.000
	Roy's Largest Root	3.521	151.920[b]	7.000	302.000	.000	.779	1063.442	1.000
RoleType	Pillai's Trace	.120	5.868[b]	7.000	302.000	.000	.120	41.079	.999
	Wilks' Lambda	.880	5.868[b]	7.000	302.000	.000	.120	41.079	.999
	Hotelling's Trace	.136	5.868[b]	7.000	302.000	.000	.120	41.079	.999
	Roy's Largest Root	.136	5.868[b]	7.000	302.000	.000	.120	41.079	.999
Survey_Year	Pillai's Trace	.030	1.324[b]	7.000	302.000	.238	.030	9.268	.563
	Wilks' Lambda	.970	1.324[b]	7.000	302.000	.238	.030	9.268	.563
	Hotelling's Trace	.031	1.324[b]	7.000	302.000	.238	.030	9.268	.563
	Roy's Largest Root	.031	1.324[b]	7.000	302.000	.238	.030	9.268	.563

a. Design: Intercept + RoleType + Survey_Year

b. Exact statistic

c. Computed using alpha = .05

a

Levene's Test of Equality of Error Variances

	F	df1	df2	Sig.
NOSACQ_Dim1	.094	1	309	.760
NOSACQ_Dim2	.031	1	309	.860
NOSACQ_Dim3	.490	1	309	.484
NOSACQ_Dim4	.078	1	309	.781
NOSACQ_Dim5	2.190	1	309	.140
NOSACQ_Dim6	.004	1	309	.951
NOSACQ_Dim7	.131	1	309	.718

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + RoleType + Survey_Year

Tests of Between-Subjects Effects

	Type III Sum of				Partial Eta	Noncent.	Observed

Source	Dependent Variable	Squares	df	Mean Square	F	Sig.	Squared	Parameter	Power[h]
Corrected Model	NOSACQ_Dim1	7.405[a]	2	3.702	12.907	.000	.077	25.815	.997
	NOSACQ_Dim2	7.471[b]	2	3.736	14.465	.000	.086	28.930	.999
	NOSACQ_Dim3	8.148[c]	2	4.074	14.290	.000	.085	28.581	.999
	NOSACQ_Dim4	2.880[d]	2	1.440	6.719	.001	.042	13.438	.915
	NOSACQ_Dim5	3.066[e]	2	1.533	6.727	.001	.042	13.453	.915
	NOSACQ_Dim6	1.439[f]	2	.720	2.953	.054	.019	5.906	.572
	NOSACQ_Dim7	.785[g]	2	.393	1.771	.172	.011	3.541	.370
Intercept	NOSACQ_Dim1	155.338	1	155.338	541.551	.000	.637	541.551	1.000
	NOSACQ_Dim2	144.843	1	144.843	560.872	.000	.646	560.872	1.000
	NOSACQ_Dim3	138.482	1	138.482	485.725	.000	.612	485.725	1.000
	NOSACQ_Dim4	178.138	1	178.138	831.073	.000	.730	831.073	1.000
	NOSACQ_Dim5	167.953	1	167.953	737.039	.000	.705	737.039	1.000
	NOSACQ_Dim6	192.066	1	192.066	788.170	.000	.719	788.170	1.000
	NOSACQ_Dim7	206.591	1	206.591	931.494	.000	.752	931.494	1.000
RoleType	NOSACQ_Dim1	6.826	1	6.826	23.796	.000	.072	23.796	.998
	NOSACQ_Dim2	7.443	1	7.443	28.822	.000	.086	28.822	1.000
	NOSACQ_Dim3	8.072	1	8.072	28.313	.000	.084	28.313	1.000
	NOSACQ_Dim4	2.495	1	2.495	11.639	.001	.036	11.639	.925
	NOSACQ_Dim5	2.848	1	2.848	12.500	.000	.039	12.500	.941
	NOSACQ_Dim6	1.399	1	1.399	5.739	.017	.018	5.739	.666
	NOSACQ_Dim7	.736	1	.736	3.317	.070	.011	3.317	.443
Survey_Year	NOSACQ_Dim1	.866	1	.866	3.021	.083	.010	3.021	.410
	NOSACQ_Dim2	.120	1	.120	.464	.496	.002	.464	.104
	NOSACQ_Dim3	.214	1	.214	.749	.387	.002	.749	.139
	NOSACQ_Dim4	.523	1	.523	2.440	.119	.008	2.440	.344
	NOSACQ_Dim5	.332	1	.332	1.456	.229	.005	1.456	.225
	NOSACQ_Dim6	.078	1	.078	.320	.572	.001	.320	.087
	NOSACQ_Dim7	.028	1	.028	.124	.725	.000	.124	.064
Error	NOSACQ_Dim1	88.347	308	.287					
	NOSACQ_Dim2	79.540	308	.258					
	NOSACQ_Dim3	87.812	308	.285					
	NOSACQ_Dim4	66.019	308	.214					
	NOSACQ_Dim5	70.186	308	.228					
	NOSACQ_Dim6	75.055	308	.244					
	NOSACQ_Dim7	68.310	308	.222					
Total	NOSACQ_Dim1	3497.444	311						
	NOSACQ_Dim2	3346.694	311						
	NOSACQ_Dim3	3285.722	311						
	NOSACQ_Dim4	3418.611	311						
	NOSACQ_Dim5	3296.959	311						

	NOSACQ_Dim6	3484.438	311
	NOSACQ_Dim7	3568.918	311
Corrected Total	NOSACQ_Dim1	95.751	310
	NOSACQ_Dim2	87.011	310
	NOSACQ_Dim3	95.960	310
	NOSACQ_Dim4	68.899	310
	NOSACQ_Dim5	73.252	310
	NOSACQ_Dim6	76.495	310
	NOSACQ_Dim7	69.095	310

a. R Squared = .077 (Adjusted R Squared = .071)

b. R Squared = .086 (Adjusted R Squared = .080)

c. R Squared = .085 (Adjusted R Squared = .079)

d. R Squared = .042 (Adjusted R Squared = .036)

e. R Squared = .042 (Adjusted R Squared = .036)

f. R Squared = .019 (Adjusted R Squared = .012)

g. R Squared = .011 (Adjusted R Squared = .005)

h. Computed using alpha = .05

Variance with Employment Type

Between-Subjects Factors

		Value Labe	N
Survey Year	1.00	2017	156
	2.00	2018	155

Box's Test of Equality of Covariance Matrices[a]

Box's M	64.116
F	2.235
df1	28
df2	332681.845
Sig.	.000

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + EmploymentStatus + Survey_Year

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.880	315.209[b]	7.000	302.000	.000	.880	2206.465	1.000
	Wilks' Lambda	.120	315.209[b]	7.000	302.000	.000	.880	2206.465	1.000
	Hotelling's Trace	7.306	315.209[b]	7.000	302.000	.000	.880	2206.465	1.000
	Roy's Largest Root	7.306	315.209[b]	7.000	302.000	.000	.880	2206.465	1.000
EmploymentStatus	Pillai's Trace	.021	.922[b]	7.000	302.000	.489	.021	6.457	.397
	Wilks' Lambda	.979	.922[b]	7.000	302.000	.489	.021	6.457	.397
	Hotelling's Trace	.021	.922[b]	7.000	302.000	.489	.021	6.457	.397
	Roy's Largest Root	.021	.922[b]	7.000	302.000	.489	.021	6.457	.397
Survey_Year	Pillai's Trace	.026	1.165[b]	7.000	302.000	.322	.026	8.158	.500
	Wilks' Lambda	.974	1.165[b]	7.000	302.000	.322	.026	8.158	.500
	Hotelling's Trace	.027	1.165[b]	7.000	302.000	.322	.026	8.158	.500
	Roy's Largest Root	.027	1.165[b]	7.000	302.000	.322	.026	8.158	.500

a. Design: Intercept + EmploymentStatus + Survey_Year

b. Exact statistic
c. Computed using alpha =
.05

a

Levene's Test of Equality of Error Variances

	F	df1	df2	Sig.
NOSACQ_Dim1	.008	1	309	.930
NOSACQ_Dim2	.106	1	309	.745
NOSACQ_Dim3	.241	1	309	.624
NOSACQ_Dim4	.114	1	309	.736
NOSACQ_Dim5	1.893	1	309	.170
NOSACQ_Dim6	.058	1	309	.809
NOSACQ_Dim7	.640	1	309	.424

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + EmploymentStatus + Survey_Year

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter
Corrected Model	NOSACQ_Dim1	.840[a]	2	.420	1.363	.257	.009	2.726
	NOSACQ_Dim2	.148[b]	2	.074	.262	.769	.002	.525
	NOSACQ_Dim3	.149[c]	2	.075	.239	.787	.002	.479
	NOSACQ_Dim4	.499[d]	2	.250	1.124	.326	.007	2.248
	NOSACQ_Dim5	.220[e]	2	.110	.464	.629	.003	.927

	NOSACQ_Dim6	.043[f]	2	.022	.087	.917	.001	.173
	NOSACQ_Dim7	.204[g]	2	.102	.457	.634	.003	.913
Intercept	NOSACQ_Dim1	375.957	1	375.957	1220.031	.000	.798	1220.031
	NOSACQ_Dim2	365.751	1	365.751	1296.882	.000	.808	1296.882
	NOSACQ_Dim3	360.509	1	360.509	1158.912	.000	.790	1158.912
	NOSACQ_Dim4	401.391	1	401.391	1807.437	.000	.854	1807.437
	NOSACQ_Dim5	372.298	1	372.298	1570.109	.000	.836	1570.109
	NOSACQ_Dim6	397.300	1	397.300	1600.600	.000	.839	1600.600
	NOSACQ_Dim7	421.204	1	421.204	1883.139	.000	.859	1883.139
EmploymentStatus	NOSACQ_Dim1	.261	1	.261	.848	.358	.003	.848
	NOSACQ_Dim2	.120	1	.120	.425	.515	.001	.425
	NOSACQ_Dim3	.073	1	.073	.234	.629	.001	.234
	NOSACQ_Dim4	.114	1	.114	.512	.475	.002	.512
	NOSACQ_Dim5	.003	1	.003	.011	.917	.000	.011
	NOSACQ_Dim6	.002	1	.002	.009	.924	.000	.009
	NOSACQ_Dim7	.155	1	.155	.691	.406	.002	.691
Survey_Year	NOSACQ_Dim1	.566	1	.566	1.836	.176	.006	1.836
	NOSACQ_Dim2	.026	1	.026	.092	.761	.000	.092
	NOSACQ_Dim3	.074	1	.074	.237	.627	.001	.237
	NOSACQ_Dim4	.392	1	.392	1.767	.185	.006	1.767
	NOSACQ_Dim5	.216	1	.216	.913	.340	.003	.913
	NOSACQ_Dim6	.041	1	.041	.165	.684	.001	.165
	NOSACQ_Dim7	.047	1	.047	.209	.648	.001	.209
Error	NOSACQ_Dim1	94.911	308	.308				
	NOSACQ_Dim2	86.863	308	.282				
	NOSACQ_Dim3	95.811	308	.311				
	NOSACQ_Dim4	68.400	308	.222				
	NOSACQ_Dim5	73.032	308	.237				
	NOSACQ_Dim6	76.452	308	.248				
	NOSACQ_Dim7	68.891	308	.224				
Total	NOSACQ_Dim1	3497.444	311					
	NOSACQ_Dim2	3346.694	311					
	NOSACQ_Dim3	3285.722	311					
	NOSACQ_Dim4	3418.611	311					
	NOSACQ_Dim5	3296.959	311					
	NOSACQ_Dim6	3484.438	311					
	NOSACQ_Dim7	3568.918	311					
Corrected Total	NOSACQ_Dim1	95.751	310					
	NOSACQ_Dim2	87.011	310					
	NOSACQ_Dim3	95.960	310					
	NOSACQ_Dim4	68.899	310					
	NOSACQ_Dim5	73.252	310					

	NOSACQ_Dim6	76.495	310					
	NOSACQ_Dim7	69.095	310					

Tests of Between-Subjects Effects

Source	Dependent Variable	Observed Power[h]
Corrected Model	NOSACQ_Dim1	.293
	NOSACQ_Dim2	.091
	NOSACQ_Dim3	.087
	NOSACQ_Dim4	.247
	NOSACQ_Dim5	.125
	NOSACQ_Dim6	.063
	NOSACQ_Dim7	.124
Intercept	NOSACQ_Dim1	1.000
	NOSACQ_Dim2	1.000
	NOSACQ_Dim3	1.000
	NOSACQ_Dim4	1.000
	NOSACQ_Dim5	1.000
	NOSACQ_Dim6	1.000
	NOSACQ_Dim7	1.000
EmploymentStatus	NOSACQ_Dim1	.151
	NOSACQ_Dim2	.100
	NOSACQ_Dim3	.077
	NOSACQ_Dim4	.110
	NOSACQ_Dim5	.051
	NOSACQ_Dim6	.051
	NOSACQ_Dim7	.132
Survey_Year	NOSACQ_Dim1	.272
	NOSACQ_Dim2	.061
	NOSACQ_Dim3	.077

	NOSACQ_Dim4	.263
	NOSACQ_Dim5	.159
	NOSACQ_Dim6	.069
	NOSACQ_Dim7	.074
Error	NOSACQ_Dim1	
	NOSACQ_Dim2	
	NOSACQ_Dim3	
	NOSACQ_Dim4	
	NOSACQ_Dim5	
	NOSACQ_Dim6	
	NOSACQ_Dim7	
Total	NOSACQ_Dim1	
	NOSACQ_Dim2	
	NOSACQ_Dim3	
	NOSACQ_Dim4	
	NOSACQ_Dim5	
	NOSACQ_Dim6	
	NOSACQ_Dim7	
Corrected Total	NOSACQ_Dim1	
	NOSACQ_Dim2	
	NOSACQ_Dim3	
	NOSACQ_Dim4	
	NOSACQ_Dim5	
	NOSACQ_Dim6	
	NOSACQ_Dim7	

a. R Squared = .009 (Adjusted R Squared = .002)

b. R Squared = .002 (Adjusted R Squared = -.005)

c. R Squared = .002 (Adjusted R Squared = -.005)

d. R Squared = .007 (Adjusted R Squared = .001)

e. R Squared = .003 (Adjusted R Squared = -.003)

f. R Squared = .001 (Adjusted R Squared = -.006)

g. R Squared = .003 (Adjusted R Squared = -.004)

h. Computed using alpha = .05

Variance with People Leader

Between-Subjects Factors

		Value Labe	N
Survey Year	1.00	2017	156
	2.00	2018	155

Box's Test of Equality of Covariance Matrices[a]

Box's M	64.116
F	2.235
df1	28
df2	332681.845
Sig.	.000

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Leader + Survey_Year

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.872	292.730[b]	7.000	302.000	.000	.872	2049.110	1.000
	Wilks' Lambda	.128	292.730[b]	7.000	302.000	.000	.872	2049.110	1.000
	Hotelling's Trace	6.785	292.730[b]	7.000	302.000	.000	.872	2049.110	1.000
	Roy's Largest Root	6.785	292.730[b]	7.000	302.000	.000	.872	2049.110	1.000
Leader	Pillai's Trace	.066	3.050[b]	7.000	302.000	.004	.066	21.353	.939
	Wilks' Lambda	.934	3.050[b]	7.000	302.000	.004	.066	21.353	.939
	Hotelling's Trace	.071	3.050[b]	7.000	302.000	.004	.066	21.353	.939
	Roy's Largest Root	.071	3.050[b]	7.000	302.000	.004	.066	21.353	.939
Survey Year	Pillai's Trace	.027	1.201[b]	7.000	302.000	.302	.027	8.407	.514
	Wilks' Lambda	.973	1.201[b]	7.000	302.000	.302	.027	8.407	.514
	Hotelling's Trace	.028	1.201[b]	7.000	302.000	.302	.027	8.407	.514
	Roy's Largest Root	.028	1.201[b]	7.000	302.000	.302	.027	8.407	.514

a. Design: Intercept + Leader + Survey_Year

b. Exact statistic

c. Computed using alpha = .05

a
Levene's Test of Equality of Error Variances

	F	df1	df2	Sig.
NOSACQ_Dim1	.003	1	309	.957
NOSACQ_Dim2	.148	1	309	.701
NOSACQ_Dim3	.453	1	309	.502
NOSACQ_Dim4	.089	1	309	.766
NOSACQ_Dim5	2.137	1	309	.145
NOSACQ_Dim6	.015	1	309	.901
NOSACQ_Dim7	.302	1	309	.583

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Leader + Survey_Year

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[h]
Corrected Model	NOSACQ_Dim1	3.758[a]	2	1.879	6.292	.002	.039	12.583	.895
	NOSACQ_Dim2	3.960[b]	2	1.980	7.342	.001	.046	14.684	.937
	NOSACQ_Dim3	4.709[c]	2	2.354	7.947	.000	.049	15.893	.954
	NOSACQ_Dim4	1.183[d]	2	.592	2.691	.069	.017	5.382	.531
	NOSACQ_Dim5	2.011[e]	2	1.006	4.348	.014	.027	8.696	.751
	NOSACQ_Dim6	1.163[f]	2	.582	2.378	.094	.015	4.756	.479
	NOSACQ_Dim7	.704[g]	2	.352	1.585	.207	.010	3.170	.335
Intercept	NOSACQ_Dim1	389.874	1	389.874	1305.327	.000	.809	1305.327	1.000
	NOSACQ_Dim2	382.351	1	382.351	1417.961	.000	.822	1417.961	1.000
	NOSACQ_Dim3	381.209	1	381.209	1286.689	.000	.807	1286.689	1.000
	NOSACQ_Dim4	351.957	1	351.957	1600.848	.000	.839	1600.848	1.000
	NOSACQ_Dim5	355.117	1	355.117	1535.314	.000	.833	1535.314	1.000
	NOSACQ_Dim6	363.785	1	363.785	1487.372	.000	.828	1487.372	1.000
	NOSACQ_Dim7	363.907	1	363.907	1638.860	.000	.842	1638.860	1.000
Leader	NOSACQ_Dim1	3.179	1	3.179	10.645	.001	.033	10.645	.902
	NOSACQ_Dim2	3.932	1	3.932	14.580	.000	.045	14.580	.968
	NOSACQ_Dim3	4.632	1	4.632	15.636	.000	.048	15.636	.976
	NOSACQ_Dim4	.798	1	.798	3.629	.058	.012	3.629	.476
	NOSACQ_Dim5	1.794	1	1.794	7.757	.006	.025	7.757	.793
	NOSACQ_Dim6	1.122	1	1.122	4.589	.033	.015	4.589	.570
	NOSACQ_Dim7	.654	1	.654	2.947	.087	.009	2.947	.402
Survey_Year	NOSACQ_Dim1	.755	1	.755	2.528	.113	.008	2.528	.354
	NOSACQ_Dim2	.083	1	.083	.309	.578	.001	.309	.086

	NOSACQ_Dim3	.166	1	.166	.561	.454	.002	.561	.116
	NOSACQ_Dim4	.455	1	.455	2.069	.151	.007	2.069	.300
	NOSACQ_Dim5	.300	1	.300	1.296	.256	.004	1.296	.206
	NOSACQ_Dim6	.071	1	.071	.291	.590	.001	.291	.084
	NOSACQ_Dim7	.030	1	.030	.135	.714	.000	.135	.065
Error	NOSACQ_Dim1	91.993	308	.299					
	NOSACQ_Dim2	83.052	308	.270					
	NOSACQ_Dim3	91.251	308	.296					
	NOSACQ_Dim4	67.716	308	.220					
	NOSACQ_Dim5	71.240	308	.231					
	NOSACQ_Dim6	75.331	308	.245					
	NOSACQ_Dim7	68.391	308	.222					
Total	NOSACQ_Dim1	3497.444	311						
	NOSACQ_Dim2	3346.694	311						
	NOSACQ_Dim3	3285.722	311						
	NOSACQ_Dim4	3418.611	311						
	NOSACQ_Dim5	3296.959	311						
	NOSACQ_Dim6	3484.438	311						
	NOSACQ_Dim7	3568.918	311						
Corrected Total	NOSACQ_Dim1	95.751	310						
	NOSACQ_Dim2	87.011	310						
	NOSACQ_Dim3	95.960	310						
	NOSACQ_Dim4	68.899	310						
	NOSACQ_Dim5	73.252	310						
	NOSACQ_Dim6	76.495	310						
	NOSACQ_Dim7	69.095	310						

a. R Squared = .039 (Adjusted R Squared = .033)

b. R Squared = .046 (Adjusted R Squared = .039)

c. R Squared = .049 (Adjusted R Squared = .043)

d. R Squared = .017 (Adjusted R Squared = .011)

e. R Squared = .027 (Adjusted R Squared = .021)

f. R Squared = .015 (Adjusted R Squared = .009)

g. R Squared = .010 (Adjusted R Squared = .004)

h. Computed using alpha = .05

Variance with Leader Role

Between-Subjects Factors

		Value Labe	N
Survey Year	1.00	2017	78
	2.00	2018	68

Box's Test of Equality of Covariance Matrices[a]

Box's M	35.929
O	1.217
df1	28
df2	69472.435
Sig.	.199

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Leader_Role + Survey_Year

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.881	145.469[b]	7.000	137.000	.000	.881	1018.285	1.000
	Wilks' Lambda	.119	145.469[b]	7.000	137.000	.000	.881	1018.285	1.000
	Hotelling's Trace	7.433	145.469[b]	7.000	137.000	.000	.881	1018.285	1.000
	Roy's Largest Root	7.433	145.469[b]	7.000	137.000	.000	.881	1018.285	1.000
Leader_Role	Pillai's Trace	.070	1.477[b]	7.000	137.000	.180	.070	10.337	.605
	Wilks' Lambda	.930	1.477[b]	7.000	137.000	.180	.070	10.337	.605
	Hotelling's Trace	.075	1.477[b]	7.000	137.000	.180	.070	10.337	.605
	Roy's Largest Root	.075	1.477[b]	7.000	137.000	.180	.070	10.337	.605
Survey_Year	Pillai's Trace	.093	2.010[b]	7.000	137.000	.058	.093	14.069	.766
	Wilks' Lambda	.907	2.010[b]	7.000	137.000	.058	.093	14.069	.766
	Hotelling's Trace	.103	2.010[b]	7.000	137.000	.058	.093	14.069	.766
	Roy's Largest Root	.103	2.010[b]	7.000	137.000	.058	.093	14.069	.766

a. Design: Intercept + Leader_Role + Survey_Year

b. Exact statistic

c. Computed using alpha = .05

a

Levene's Test of Equality of Error Variances

F	df1	df2	Sig.

NOSACQ_Dim1	.215	1	144	.643
NOSACQ_Dim2	.013	1	144	.911
NOSACQ_Dim3	2.283	1	144	.133
NOSACQ_Dim4	.108	1	144	.743
NOSACQ_Dim5	.439	1	144	.508
NOSACQ_Dim6	.022	1	144	.883
NOSACQ_Dim7	.595	1	144	.442

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Leader_Role + Survey_Year

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[h]
Corrected Model	NOSACQ_Dim1	.934[a]	2	.467	2.159	.119	.029	4.319	.436
	NOSACQ_Dim2	1.508[b]	2	.754	3.946	.021	.052	7.892	.702
	NOSACQ_Dim3	.501[c]	2	.250	1.092	.338	.015	2.184	.239
	NOSACQ_Dim4	.514[d]	2	.257	1.504	.226	.021	3.009	.316
	NOSACQ_Dim5	1.095[e]	2	.547	2.602	.078	.035	5.204	.512
	NOSACQ_Dim6	1.453[f]	2	.727	3.473	.034	.046	6.946	.642
	NOSACQ_Dim7	1.093[g]	2	.547	2.444	.090	.033	4.888	.485
Intercept	NOSACQ_Dim1	145.695	1	145.695	673.771	.000	.825	673.771	1.000
	NOSACQ_Dim2	149.768	1	149.768	783.960	.000	.846	783.960	1.000
	NOSACQ_Dim3	135.883	1	135.883	592.842	.000	.806	592.842	1.000
	NOSACQ_Dim4	132.515	1	132.515	775.660	.000	.844	775.660	1.000
	NOSACQ_Dim5	137.273	1	137.273	652.473	.000	.820	652.473	1.000
	NOSACQ_Dim6	148.932	1	148.932	711.780	.000	.833	711.780	1.000
	NOSACQ_Dim7	147.521	1	147.521	659.593	.000	.822	659.593	1.000
Leader_Role	NOSACQ_Dim1	.686	1	.686	3.171	.077	.022	3.171	.424
	NOSACQ_Dim2	1.434	1	1.434	7.505	.007	.050	7.505	.777
	NOSACQ_Dim3	.464	1	.464	2.023	.157	.014	2.023	.293
	NOSACQ_Dim4	.266	1	.266	1.559	.214	.011	1.559	.237
	NOSACQ_Dim5	.717	1	.717	3.406	.067	.023	3.406	.450
	NOSACQ_Dim6	1.207	1	1.207	5.769	.018	.039	5.769	.665
	NOSACQ_Dim7	.904	1	.904	4.042	.046	.027	4.042	.515
Survey_Year	NOSACQ_Dim1	.177	1	.177	.817	.368	.006	.817	.146
	NOSACQ_Dim2	.026	1	.026	.136	.713	.001	.136	.065
	NOSACQ_Dim3	.017	1	.017	.072	.789	.001	.072	.058
	NOSACQ_Dim4	.201	1	.201	1.177	.280	.008	1.177	.190
	NOSACQ_Dim5	.286	1	.286	1.360	.246	.009	1.360	.212
	NOSACQ_Dim6	.155	1	.155	.741	.391	.005	.741	.137
	NOSACQ_Dim7	.271	1	.271	1.210	.273	.008	1.210	.194

Error	NOSACQ_Dim1	30.922	143	.216
	NOSACQ_Dim2	27.319	143	.191
	NOSACQ_Dim3	32.777	143	.229
	NOSACQ_Dim4	24.430	143	.171
	NOSACQ_Dim5	30.086	143	.210
	NOSACQ_Dim6	29.921	143	.209
	NOSACQ_Dim7	31.983	143	.224
Total	NOSACQ_Dim1	1731.272	146	
	NOSACQ_Dim2	1673.347	146	
	NOSACQ_Dim3	1653.278	146	
	NOSACQ_Dim4	1647.167	146	
	NOSACQ_Dim5	1619.612	146	
	NOSACQ_Dim6	1692.719	146	
	NOSACQ_Dim7	1724.918	146	
Corrected Total	NOSACQ_Dim1	31.856	145	
	NOSACQ_Dim2	28.826	145	
	NOSACQ_Dim3	33.277	145	
	NOSACQ_Dim4	24.944	145	
	NOSACQ_Dim5	31.180	145	
	NOSACQ_Dim6	31.375	145	
	NOSACQ_Dim7	33.076	145	

a. R Squared = .029 (Adjusted R Squared = .016)

b. R Squared = .052 (Adjusted R Squared = .039)

c. R Squared = .015 (Adjusted R Squared = .001)

d. R Squared = .021 (Adjusted R Squared = .007)

e. R Squared = .035 (Adjusted R Squared = .022)

f. R Squared = .046 (Adjusted R Squared = .033)

g. R Squared = .033 (Adjusted R Squared = .020)

h. Computed using alpha = .05

Variance with Workgroup

Between-Subjects Factors

		Value Labe	N
Survey Year	1.00	2017	156
	2.00	2018	155

Box's Test of Equality of Covariance Matrices[a]

Box's M	64.116

F	2.235
df1	28
df2	332681.845
Sig.	.000

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Contract_BusinessGroup + Survey_Year

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter
Intercept	Pillai's Trace	.936	631.790[b]	7.000	302.000	.000	.936	4422.532
	Wilks' Lambda	.064	631.790[b]	7.000	302.000	.000	.936	4422.532
	Hotelling's Trace	14.644	631.790[b]	7.000	302.000	.000	.936	4422.532
	Roy's Largest Root	14.644	631.790[b]	7.000	302.000	.000	.936	4422.532
Contract_BusinessGroup	Pillai's Trace	.055	2.496[b]	7.000	302.000	.017	.055	17.472
	Wilks' Lambda	.945	2.496[b]	7.000	302.000	.017	.055	17.472
	Hotelling's Trace	.058	2.496[b]	7.000	302.000	.017	.055	17.472
	Roy's Largest Root	.058	2.496[b]	7.000	302.000	.017	.055	17.472
Survey_Year	Pillai's Trace	.029	1.270[b]	7.000	302.000	.265	.029	8.887
	Wilks' Lambda	.971	1.270[b]	7.000	302.000	.265	.029	8.887
	Hotelling's Trace	.029	1.270[b]	7.000	302.000	.265	.029	8.887
	Roy's Largest Root	.029	1.270[b]	7.000	302.000	.265	.029	8.887

Multivariate Tests[a]

Effect		Observed Power[c]
Intercept	Pillai's Trace	1.000
	Wilks' Lambda	1.000
	Hotelling's Trace	1.000
	Roy's Largest Root	1.000
Contract BusinessGroup	Pillai's Trace	.875
	Wilks' Lambda	.875
	Hotelling's Trace	.875

	Roy's Largest Root	.875
Survey_Year	Pillai's Trace	.542
	Wilks' Lambda	.542
	Hotelling's Trace	.542
	Roy's Largest Root	.542

a. Design: Intercept + Contract_BusinessGroup + Survey_Year

b. Exact statistic

c. Computed using alpha = .05

a
Levene's Test of Equality of Error Variances

	F	df1	df2	Sig.
NOSACQ_Dim1	.084	1	309	.772
NOSACQ_Dim2	.008	1	309	.928
NOSACQ_Dim3	1.217	1	309	.271
NOSACQ_Dim4	.076	1	309	.783
NOSACQ_Dim5	1.603	1	309	.206
NOSACQ_Dim6	.054	1	309	.816
NOSACQ_Dim7	.904	1	309	.342

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Contract_BusinessGroup + Survey_Year

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig	Partial Eta Squared	Noncent. Parameter
Corrected Model	NOSACQ_Dim1	.903[a]	2	.452	1.467	.232	.009	2.934
	NOSACQ_Dim2	1.289[b]	2	.644	2.316	.100	.015	4.631
	NOSACQ_Dim3	2.442[c]	2	1.221	4.021	.019	.025	8.041
	NOSACQ_Dim4	.605[d]	2	.303	1.365	.257	.009	2.730
	NOSACQ_Dim5	.857[e]	2	.429	1.824	.163	.012	3.648
	NOSACQ_Dim6	1.665[f]	2	.832	3.426	.034	.022	6.852
	NOSACQ_Dim7	.613[g]	2	.307	1.379	.253	.009	2.758
Intercept	NOSACQ_Dim1	810.693	1	810.693	2632.566	.000	.895	2632.566
	NOSACQ_Dim2	749.688	1	749.688	2693.628	.000	.897	2693.628
	NOSACQ_Dim3	713.670	1	713.670	2350.446	.000	.884	2350.446
	NOSACQ_Dim4	803.026	1	803.026	3621.590	.000	.922	3621.590
	NOSACQ_Dim5	756.481	1	756.481	3218.439	.000	.913	3218.439
	NOSACQ_Dim6	777.669	1	777.669	3200.889	.000	.912	3200.889

	NOSACQ_Dim7	825.343	1	825.343	3712.022	.000	.923	3712.022
Contract_BusinessGroup	NOSACQ_Dim1	.324	1	.324	1.054	.305	.003	1.054
	NOSACQ_Dim2	1.261	1	1.261	4.531	.034	.014	4.531
	NOSACQ_Dim3	2.365	1	2.365	7.790	.006	.025	7.790
	NOSACQ_Dim4	.220	1	.220	.992	.320	.003	.992
	NOSACQ_Dim5	.640	1	.640	2.724	.100	.009	2.724
	NOSACQ_Dim6	1.624	1	1.624	6.684	.010	.021	6.684
	NOSACQ_Dim7	.564	1	.564	2.534	.112	.008	2.534
Survey_Year	NOSACQ_Dim1	.516	1	.516	1.677	.196	.005	1.677
	NOSACQ_Dim2	.008	1	.008	.027	.868	.000	.027
	NOSACQ_Dim3	.028	1	.028	.091	.763	.000	.091
	NOSACQ_Dim4	.344	1	.344	1.549	.214	.005	1.549
	NOSACQ_Dim5	.167	1	.167	.709	.400	.002	.709
	NOSACQ_Dim6	.012	1	.012	.051	.822	.000	.051
	NOSACQ_Dim7	.076	1	.076	.341	.559	.001	.341
Error	NOSACQ_Dim1	94.848	308	.308				
	NOSACQ_Dim2	85.722	308	.278				
	NOSACQ_Dim3	93.519	308	.304				
	NOSACQ_Dim4	68.294	308	.222				
	NOSACQ_Dim5	72.394	308	.235				
	NOSACQ_Dim6	74.830	308	.243				
	NOSACQ_Dim7	68.482	308	.222				
Total	NOSACQ_Dim1	3497.444	311					
	NOSACQ_Dim2	3346.694	311					
	NOSACQ_Dim3	3285.722	311					
	NOSACQ_Dim4	3418.611	311					
	NOSACQ_Dim5	3296.959	311					
	NOSACQ_Dim6	3484.438	311					
	NOSACQ_Dim7	3568.918	311					
Corrected Total	NOSACQ_Dim1	95.751	310					
	NOSACQ_Dim2	87.011	310					

Tests of Between-Subjects Effects

Source	Dependent Variable	Observed Power[h]
Corrected Model	NOSACQ_Dim1	.312
	NOSACQ_Dim2	.468
	NOSACQ_Dim3	.715
	NOSACQ_Dim4	.293

	NOSACQ_Dim5	.380
	NOSACQ_Dim6	.641
	NOSACQ_Dim7	.296
Intercept	NOSACQ_Dim1	1.000
	NOSACQ_Dim2	1.000
	NOSACQ_Dim3	1.000
	NOSACQ_Dim4	1.000
	NOSACQ_Dim5	1.000
	NOSACQ_Dim6	1.000
	NOSACQ_Dim7	1.000
Contract_BusinessGroup	NOSACQ_Dim1	.176
	NOSACQ_Dim2	.564
	NOSACQ_Dim3	.795
	NOSACQ_Dim4	.168
	NOSACQ_Dim5	.377
	NOSACQ_Dim6	.732
	NOSACQ_Dim7	.355
Survey_Year	NOSACQ_Dim1	.252
	NOSACQ_Dim2	.053
	NOSACQ_Dim3	.060
	NOSACQ_Dim4	.237
	NOSACQ_Dim5	.134
	NOSACQ_Dim6	.056
	NOSACQ_Dim7	.090
Error	NOSACQ_Dim1	
	NOSACQ_Dim2	
	NOSACQ_Dim3	
	NOSACQ_Dim4	

	NOSACQ_Dim5
	NOSACQ_Dim6
	NOSACQ_Dim7
Total	NOSACQ_Dim1
	NOSACQ_Dim2
	NOSACQ_Dim3
	NOSACQ_Dim4
	NOSACQ_Dim5
	NOSACQ_Dim6
	NOSACQ_Dim7
Corrected Total	NOSACQ_Dim1
	NOSACQ_Dim2

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter
	NOSACQ_Dim3	95.960	310					
	NOSACQ_Dim4	68.899	310					
	NOSACQ_Dim5	73.252	310					
	NOSACQ_Dim6	76.495	310					
	NOSACQ_Dim7	69.095	310					

Tests of Between-Subjects Effects

Source	Dependent Variable	Observed Power[h]
	NOSACQ_Dim3	
	NOSACQ_Dim4	
	NOSACQ_Dim5	
	NOSACQ_Dim6	
	NOSACQ_Dim7	

a. R Squared = .009 (Adjusted R Squared = .003)

b. R Squared = .015 (Adjusted R Squared = .008)

c. R Squared = .025 (Adjusted R Squared = .019)

d. R Squared = .009 (Adjusted R Squared = .002)

e. R Squared = .012 (Adjusted R Squared = .005)

f. R Squared = .022 (Adjusted R Squared = .015)

g. R Squared = .009 (Adjusted R Squared = .002)

h. Computed using alpha = .05

Variance with Length of Service

Between-Subjects Factors

		Value Label	N
Survey Year	1.00	2017	156
	2.00	2018	155

Box's Test of Equality of Covariance Matrices[a]

Box's M	64.116
F	2.235
df1	28
df2	332681.845
Sig.	.000

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + LengthService + Survey_Year

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.916	471.605[b]	7.000	302.000	.000	.916	3301.235	1.000
	Wilks' Lambda	.084	471.605[b]	7.000	302.000	.000	.916	3301.235	1.000
	Hotelling's Trace	10.931	471.605[b]	7.000	302.000	.000	.916	3301.235	1.000
	Roy's Largest Root	10.931	471.605[b]	7.000	302.000	.000	.916	3301.235	1.000
LengthService	Pillai's Trace	.023	1.018[b]	7.000	302.000	.418	.023	7.128	.439
	Wilks' Lambda	.977	1.018[b]	7.000	302.000	.418	.023	7.128	.439
	Hotelling's Trace	.024	1.018[b]	7.000	302.000	.418	.023	7.128	.439
	Roy's Largest Root	.024	1.018[b]	7.000	302.000	.418	.023	7.128	.439
Survey_Year	Pillai's Trace	.026	1.160[b]	7.000	302.000	.326	.026	8.118	.498

	Wilks' Lambda	.974	1.160[b]	7.000	302.000	.326	.026	8.118	.498
	Hotelling's Trace	.027	1.160[b]	7.000	302.000	.326	.026	8.118	.498
	Roy's Largest Root	.027	1.160[b]	7.000	302.000	.326	.026	8.118	.498

a. Design: Intercept + LengthService + Survey_Year

b. Exact statistic

c. Computed using alpha = .05

a

Levene's Test of Equality of Error Variances

	F	df 1	df2	Sig.
NOSACQ_Dim 1	.066	1	309	.797
NOSACQ_Dim 2	.028	1	309	.868
NOSACQ_Dim 3	.424	1	309	.515
NOSACQ_Dim 4	.021	1	309	.886
NOSACQ_Dim 5	1.857	1	309	.174
NOSACQ_Dim 6	.118	1	309	.732
NOSACQ_Dim 7	.413	1	309	.521

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + LengthService + Survey_Year

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[h]
Corrected Model	NOSACQ_Dim1	.726[a]	2	.363	1.176	.310	.008	2.353	.257
	NOSACQ_Dim2	.514[b]	2	.257	.915	.402	.006	1.830	.208
	NOSACQ_Dim3	1.294[c]	2	.647	2.105	.124	.013	4.211	.431
	NOSACQ_Dim4	.767[d]	2	.384	1.734	.178	.011	3.467	.363
	NOSACQ_Dim5	.382[e]	2	.191	.808	.447	.005	1.616	.188
	NOSACQ_Dim6	.456[f]	2	.228	.924	.398	.006	1.847	.209
	NOSACQ_Dim7	.110[g]	2	.055	.246	.782	.002	.492	.089
Intercept	NOSACQ_Dim1	597.513	1	597.513	1936.679	.000	.863	1936.679	1.000
	NOSACQ_Dim2	586.647	1	586.647	2088.940	.000	.872	2088.940	1.000
	NOSACQ_Dim3	592.280	1	592.280	1927.011	.000	.862	1927.011	1.000
	NOSACQ_Dim4	598.906	1	598.906	2707.436	.000	.898	2707.436	1.000
	NOSACQ_Dim5	567.675	1	567.675	2399.424	.000	.886	2399.424	1.000
	NOSACQ_Dim6	610.249	1	610.249	2471.859	.000	.889	2471.859	1.000
	NOSACQ_Dim7	608.251	1	608.251	2715.690	.000	.898	2715.690	1.000
LengthService	NOSACQ_Dim1	.147	1	.147	.476	.491	.002	.476	.106
	NOSACQ_Dim2	.486	1	.486	1.731	.189	.006	1.731	.259

	NOSACQ_Dim3	1.218	1	1.218	3.963	.047	.013	3.963	.510
	NOSACQ_Dim4	.382	1	.382	1.725	.190	.006	1.725	.258
	NOSACQ_Dim5	.165	1	.165	.698	.404	.002	.698	.132
	NOSACQ_Dim6	.415	1	.415	1.682	.196	.005	1.682	.253
	NOSACQ_Dim7	.060	1	.060	.270	.604	.001	.270	.081
Survey_Year	NOSACQ_Dim1	.469	1	.469	1.521	.218	.005	1.521	.233
	NOSACQ_Dim2	.002	1	.002	.008	.930	.000	.008	.051
	NOSACQ_Dim3	.007	1	.007	.024	.878	.000	.024	.053
	NOSACQ_Dim4	.257	1	.257	1.163	.282	.004	1.163	.189
	NOSACQ_Dim5	.152	1	.152	.644	.423	.002	.644	.126
	NOSACQ_Dim6	.008	1	.008	.033	.857	.000	.033	.054
	NOSACQ_Dim7	.068	1	.068	.305	.581	.001	.305	.085
Error	NOSACQ_Dim1	95.026	308	.309					
	NOSACQ_Dim2	86.497	308	.281					
	NOSACQ_Dim3	94.666	308	.307					
	NOSACQ_Dim4	68.132	308	.221					
	NOSACQ_Dim5	72.869	308	.237					
	NOSACQ_Dim6	76.039	308	.247					
	NOSACQ_Dim7	68.985	308	.224					
Total	NOSACQ_Dim1	3497.444	311						
	NOSACQ_Dim2	3346.694	311						
	NOSACQ_Dim3	3285.722	311						
	NOSACQ_Dim4	3418.611	311						
	NOSACQ_Dim5	3296.959	311						
	NOSACQ_Dim6	3484.438	311						
	NOSACQ_Dim7	3568.918	311						
Corrected Total	NOSACQ_Dim1	95.751	310						
	NOSACQ_Dim2	87.011	310						
	NOSACQ_Dim3	95.960	310						
	NOSACQ_Dim4	68.899	310						
	NOSACQ_Dim5	73.252	310						
	NOSACQ_Dim6	76.495	310						
	NOSACQ_Dim7	69.095	310						

a. R Squared = .008 (Adjusted R Squared = .001)

b. R Squared = .006 (Adjusted R Squared = -.001)

c. R Squared = .013 (Adjusted R Squared = .007)

d. R Squared = .011 (Adjusted R Squared = .005)

e. R Squared = .005 (Adjusted R Squared = -.001)

f. R Squared = .006 (Adjusted R Squared = .000)

g. R Squared = .002 (Adjusted R Squared = -.005)

h. Computed using alpha = .05

Variance with Age

Between-Subjects Factors

		Value Labe	N
Survey Year	1.00	2017	156
	2.00	2018	155

Box's Test of Equality of Covariance Matrices[a]

Box's M	64.116
F	2.235
df1	28
df2	332681.845
Sig.	.000

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Age + Survey_Year

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.757	134.596[b]	7.000	302.000	.000	.757	942.175	1.000
	Wilks' Lambda	.243	134.596[b]	7.000	302.000	.000	.757	942.175	1.000
	Hotelling's Trace	3.120	134.596[b]	7.000	302.000	.000	.757	942.175	1.000
	Roy's Largest Root	3.120	134.596[b]	7.000	302.000	.000	.757	942.175	1.000
Age	Pillai's Trace	.054	2.466[b]	7.000	302.000	.018	.054	17.260	.870
	Wilks' Lambda	.946	2.466[b]	7.000	302.000	.018	.054	17.260	.870
	Hotelling's Trace	.057	2.466[b]	7.000	302.000	.018	.054	17.260	.870
	Roy's Largest Root	.057	2.466[b]	7.000	302.000	.018	.054	17.260	.870
Survey_Year	Pillai's Trace	.027	1.200[b]	7.000	302.000	.302	.027	8.402	.514
	Wilks' Lambda	.973	1.200[b]	7.000	302.000	.302	.027	8.402	.514
	Hotelling's Trace	.028	1.200[b]	7.000	302.000	.302	.027	8.402	.514
	Roy's Largest Root	.028	1.200[b]	7.000	302.000	.302	.027	8.402	.514

a. Design: Intercept + Age + Survey_Year

b. Exact statistic

c. Computed using alpha = .05

a
Levene's Test of Equality of Error Variances

	F	df1	df2	Sig.
NOSACQ_Dim1	.013	1	309	.908
NOSACQ_Dim2	.082	1	309	.775
NOSACQ_Dim3	.401	1	309	.527
NOSACQ_Dim4	.083	1	309	.774
NOSACQ_Dim5	1.943	1	309	.164
NOSACQ_Dim6	.101	1	309	.751
NOSACQ_Dim7	.431	1	309	.512

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Age + Survey_Year

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[h]
Corrected Model	NOSACQ_Dim1	.876[a]	2	.438	1.423	.243	.009	2.845	.304
	NOSACQ_Dim2	.482[b]	2	.241	.857	.425	.006	1.714	.197
	NOSACQ_Dim3	.283[c]	2	.141	.455	.635	.003	.911	.124
	NOSACQ_Dim4	.385[d]	2	.193	.866	.421	.006	1.733	.199
	NOSACQ_Dim5	.804[e]	2	.402	1.708	.183	.011	3.416	.358
	NOSACQ_Dim6	.135[f]	2	.067	.272	.762	.002	.544	.093
	NOSACQ_Dim7	.098[g]	2	.049	.219	.803	.001	.438	.084
Intercept	NOSACQ_Dim1	163.547	1	163.547	530.936	.000	.633	530.936	1.000
	NOSACQ_Dim2	153.326	1	153.326	545.761	.000	.639	545.761	1.000
	NOSACQ_Dim3	177.962	1	177.962	572.889	.000	.650	572.889	1.000
	NOSACQ_Dim4	174.776	1	174.776	785.700	.000	.718	785.700	1.000
	NOSACQ_Dim5	149.346	1	149.346	634.920	.000	.673	634.920	1.000
	NOSACQ_Dim6	169.853	1	169.853	685.108	.000	.690	685.108	1.000
	NOSACQ_Dim7	176.766	1	176.766	789.077	.000	.719	789.077	1.000
Age	NOSACQ_Dim1	.297	1	.297	.966	.327	.003	.966	.165
	NOSACQ_Dim2	.454	1	.454	1.614	.205	.005	1.614	.245
	NOSACQ_Dim3	.207	1	.207	.665	.415	.002	.665	.129
	NOSACQ_Dim4	9.466E-6	1	9.466E-6	.000	.995	.000	.000	.050
	NOSACQ_Dim5	.586	1	.586	2.493	.115	.008	2.493	.350
	NOSACQ_Dim6	.094	1	.094	.379	.538	.001	.379	.094
	NOSACQ_Dim7	.048	1	.048	.216	.642	.001	.216	.075
Survey_Year	NOSACQ_Dim1	.629	1	.629	2.042	.154	.007	2.042	.297
	NOSACQ_Dim2	.044	1	.044	.155	.694	.001	.155	.068
	NOSACQ_Dim3	.061	1	.061	.197	.657	.001	.197	.073
	NOSACQ_Dim4	.384	1	.384	1.725	.190	.006	1.725	.258
	NOSACQ_Dim5	.263	1	.263	1.116	.292	.004	1.116	.184

	NOSACQ_Dim6	.049	1	.049	.196	.658	.001	.196	.073
	NOSACQ_Dim7	.044	1	.044	.195	.659	.001	.195	.072
Error	NOSACQ_Dim1	94.875	308	.308					
	NOSACQ_Dim2	86.530	308	.281					
	NOSACQ_Dim3	95.677	308	.311					
	NOSACQ_Dim4	68.514	308	.222					
	NOSACQ_Dim5	72.448	308	.235					
	NOSACQ_Dim6	76.360	308	.248					
	NOSACQ_Dim7	68.997	308	.224					
Total	NOSACQ_Dim1	3497.444	311						
	NOSACQ_Dim2	3346.694	311						
	NOSACQ_Dim3	3285.722	311						
	NOSACQ_Dim4	3418.611	311						
	NOSACQ_Dim5	3296.959	311						
	NOSACQ_Dim6	3484.438	311						
	NOSACQ_Dim7	3568.918	311						
Corrected Total	NOSACQ_Dim1	95.751	310						
	NOSACQ_Dim2	87.011	310						
	NOSACQ_Dim3	95.960	310						
	NOSACQ_Dim4	68.899	310						
	NOSACQ_Dim5	73.252	310						
	NOSACQ_Dim6	76.495	310						
	NOSACQ_Dim7	69.095	310						

a. R Squared = .009 (Adjusted R Squared = .003)

b. R Squared = .006 (Adjusted R Squared = -.001)

c. R Squared = .003 (Adjusted R Squared = -.004)

d. R Squared = .006 (Adjusted R Squared = -.001)

e. R Squared = .011 (Adjusted R Squared = .005)

f. R Squared = .002 (Adjusted R Squared = -.005)

g. R Squared = .001 (Adjusted R Squared = -.005)

h. Computed using alpha = .05

Variance with ALI Dimensions

Between-Subjects Factors

		Value Labe	N
Survey Year	1.00	2017	154
	2.00	2018	154

Box's Test of Equality of Covariance Matrices[a]

Box's M	64.042
F	2.232
df1	28
df2	326281.525
Sig.	.000

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + ALI_S + ALI_R + ALI_B + ALI_M + Survey_Year

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.640	75.239[b]	7.000	296.000	.000	.640	526.671	1.000
	Wilks' Lambda	.360	75.239[b]	7.000	296.000	.000	.640	526.671	1.000
	Hotelling's Trace	1.779	75.239[b]	7.000	296.000	.000	.640	526.671	1.000
	Roy's Largest Root	1.779	75.239[b]	7.000	296.000	.000	.640	526.671	1.000
ALI_S	Pillai's Trace	.007	.315[b]	7.000	296.000	.947	.007	2.204	.146
	Wilks' Lambda	.993	.315[b]	7.000	296.000	.947	.007	2.204	.146
	Hotelling's Trace	.007	.315[b]	7.000	296.000	.947	.007	2.204	.146
	Roy's Largest Root	.007	.315[b]	7.000	296.000	.947	.007	2.204	.146
ALI_R	Pillai's Trace	.067	3.049[b]	7.000	296.000	.004	.067	21.341	.939
	Wilks' Lambda	.933	3.049[b]	7.000	296.000	.004	.067	21.341	.939
	Hotelling's Trace	.072	3.049[b]	7.000	296.000	.004	.067	21.341	.939
	Roy's Largest Root	.072	3.049[b]	7.000	296.000	.004	.067	21.341	.939
ALI_B	Pillai's Trace	.021	.912[b]	7.000	296.000	.497	.021	6.384	.393
	Wilks' Lambda	.979	.912[b]	7.000	296.000	.497	.021	6.384	.393
	Hotelling's Trace	.022	.912[b]	7.000	296.000	.497	.021	6.384	.393
	Roy's Largest Root	.022	.912[b]	7.000	296.000	.497	.021	6.384	.393
ALI_M	Pillai's Trace	.034	1.493[b]	7.000	296.000	.169	.034	10.450	.625
	Wilks' Lambda	.966	1.493[b]	7.000	296.000	.169	.034	10.450	.625
	Hotelling's Trace	.035	1.493[b]	7.000	296.000	.169	.034	10.450	.625
	Roy's Largest Root	.035	1.493[b]	7.000	296.000	.169	.034	10.450	.625
Survey_Year	Pillai's Trace	.028	1.203[b]	7.000	296.000	.301	.028	8.419	.515
	Wilks' Lambda	.972	1.203[b]	7.000	296.000	.301	.028	8.419	.515

	Hotelling's Trace	.028	1.203[b]	7.000	296.000	.301	.028	8.419	.515
	Roy's Largest Root	.028	1.203[b]	7.000	296.000	.301	.028	8.419	.515

a. Design: Intercept + ALI_S + ALI_R + ALI_B + ALI_M + Survey_Year

b. Exact statistic

c. Computed using alpha = .05

a
Levene's Test of Equality of Error Variances

	F	df1	df2	Sig.
NOSACQ_Dim1	.015	1	306	.903
NOSACQ_Dim2	.344	1	306	.558
NOSACQ_Dim3	.004	1	306	.947
NOSACQ_Dim4	.326	1	306	.568
NOSACQ_Dim5	.429	1	306	.513
NOSACQ_Dim6	.128	1	306	.721
NOSACQ_Dim7	1.085	1	306	.298

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + ALI_S + ALI_R + ALI_B + ALI_M + Survey_Year

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[h]
Corrected Model	NOSACQ_Dim1	40.451[a]	5	8.090	44.413	.000	.424	222.064	1.000
	NOSACQ_Dim2	35.729[b]	5	7.146	42.256	.000	.412	211.281	1.000
	NOSACQ_Dim3	37.642[c]	5	7.528	39.236	.000	.394	196.182	1.000
	NOSACQ_Dim4	16.834[d]	5	3.367	19.666	.000	.246	98.329	1.000
	NOSACQ_Dim5	15.335[e]	5	3.067	16.079	.000	.210	80.397	1.000
	NOSACQ_Dim6	21.914[f]	5	4.383	24.381	.000	.288	121.906	1.000
	NOSACQ_Dim7	11.774[g]	5	2.355	12.553	.000	.172	62.764	1.000
Intercept	NOSACQ_Dim1	37.653	1	37.653	206.705	.000	.406	206.705	1.000
	NOSACQ_Dim2	36.589	1	36.589	216.363	.000	.417	216.363	1.000
	NOSACQ_Dim3	35.331	1	35.331	184.136	.000	.379	184.136	1.000
	NOSACQ_Dim4	68.231	1	68.231	398.551	.000	.569	398.551	1.000
	NOSACQ_Dim5	66.650	1	66.650	349.434	.000	.536	349.434	1.000
	NOSACQ_Dim6	60.376	1	60.376	335.864	.000	.527	335.864	1.000
	NOSACQ_Dim7	80.328	1	80.328	428.204	.000	.586	428.204	1.000
ALI_S	NOSACQ_Dim1	.004	1	.004	.021	.884	.000	.021	.052
	NOSACQ_Dim2	.008	1	.008	.046	.830	.000	.046	.055
	NOSACQ_Dim3	.036	1	.036	.189	.664	.001	.189	.072
	NOSACQ_Dim4	.045	1	.045	.261	.610	.001	.261	.080

	NOSACQ_Dim5	.005	1	.005	.028	.868	.000	.028	.053
	NOSACQ_Dim6	.016	1	.016	.091	.763	.000	.091	.060
	NOSACQ_Dim7	.077	1	.077	.408	.524	.001	.408	.098
ALI_R	NOSACQ_Dim1	2.382	1	2.382	13.076	.000	.042	13.076	.950
	NOSACQ_Dim2	.653	1	.653	3.861	.050	.013	3.861	.500
	NOSACQ_Dim3	2.779	1	2.779	14.481	.000	.046	14.481	.967
	NOSACQ_Dim4	1.736	1	1.736	10.142	.002	.032	10.142	.888
	NOSACQ_Dim5	.986	1	.986	5.167	.024	.017	5.167	.620
	NOSACQ_Dim6	1.451	1	1.451	8.072	.005	.026	8.072	.808
	NOSACQ_Dim7	.676	1	.676	3.604	.059	.012	3.604	.473
ALI_B	NOSACQ_Dim1	.309	1	.309	1.696	.194	.006	1.696	.255
	NOSACQ_Dim2	.634	1	.634	3.749	.054	.012	3.749	.488
	NOSACQ_Dim3	.071	1	.071	.371	.543	.001	.371	.093
	NOSACQ_Dim4	.030	1	.030	.175	.676	.001	.175	.070
	NOSACQ_Dim5	.286	1	.286	1.501	.221	.005	1.501	.231
	NOSACQ_Dim6	.320	1	.320	1.780	.183	.006	1.780	.265
	NOSACQ_Dim7	.174	1	.174	.929	.336	.003	.929	.161
ALI_M	NOSACQ_Dim1	.425	1	.425	2.336	.127	.008	2.336	.331
	NOSACQ_Dim2	.965	1	.965	5.706	.018	.019	5.706	.663
	NOSACQ_Dim3	.392	1	.392	2.043	.154	.007	2.043	.297
	NOSACQ_Dim4	.004	1	.004	.021	.886	.000	.021	.052
	NOSACQ_Dim5	.004	1	.004	.018	.892	.000	.018	.052
	NOSACQ_Dim6	.013	1	.013	.071	.790	.000	.071	.058
	NOSACQ_Dim7	.331	1	.331	1.764	.185	.006	1.764	.263
Survey_Year	NOSACQ_Dim1	.487	1	.487	2.674	.103	.009	2.674	.371
	NOSACQ_Dim2	.034	1	.034	.202	.653	.001	.202	.073

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[h]
	NOSACQ_Dim3	.044	1	.044	.227	.634	.001	.227	.076
	NOSACQ_Dim4	.310	1	.310	1.810	.180	.006	1.810	.268
	NOSACQ_Dim5	.179	1	.179	.936	.334	.003	.936	.161
	NOSACQ_Dim6	.023	1	.023	.128	.721	.000	.128	.065
	NOSACQ_Dim7	.091	1	.091	.483	.488	.002	.483	.107
Error	NOSACQ_Dim1	55.011	302	.182					
	NOSACQ_Dim2	51.070	302	.169					
	NOSACQ_Dim3	57.946	302	.192					

	NOSACQ_Dim4	51.702	302	.171
	NOSACQ_Dim5	57.603	302	.191
	NOSACQ_Dim6	54.289	302	.180
	NOSACQ_Dim7	56.653	302	.188
Total	NOSACQ_Dim1	3468.235	308	
	NOSACQ_Dim2	3319.653	308	
	NOSACQ_Dim3	3260.611	308	
	NOSACQ_Dim4	3392.583	308	
	NOSACQ_Dim5	3271.633	308	
	NOSACQ_Dim6	3457.438	308	
	NOSACQ_Dim7	3543.551	308	
Corrected Total	NOSACQ_Dim1	95.462	307	
	NOSACQ_Dim2	86.800	307	
	NOSACQ_Dim3	95.588	307	
	NOSACQ_Dim4	68.536	307	
	NOSACQ_Dim5	72.938	307	
	NOSACQ_Dim6	76.203	307	
	NOSACQ_Dim7	68.428	307	

a. R Squared = .424 (Adjusted R Squared = .414)

b. R Squared = .412 (Adjusted R Squared = .402)

c. R Squared = .394 (Adjusted R Squared = .384)

d. R Squared = .246 (Adjusted R Squared = .233)

e. R Squared = .210 (Adjusted R Squared = .197)

f. R Squared = .288 (Adjusted R Squared = .276)

g. R Squared = .172 (Adjusted R Squared = .158)

h. Computed using alpha = .05

Variance with ALI Mean

Between-Subjects Factors

		Value Labe	N
Survey Year	1.00	2017	154

2.00	2018	154

Box's Test of Equality of Covariance Matrices[a]

Box's M	64.042
F	2.232
df1	28
df2	326281.525
Sig.	.000

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + ALI_Mean + Survey_Year

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.652	80.197[b]	7.000	299.000	.000	.652	561.380	1.000
	Wilks' Lambda	.348	80.197[b]	7.000	299.000	.000	.652	561.380	1.000
	Hotelling's Trace	1.878	80.197[b]	7.000	299.000	.000	.652	561.380	1.000
	Roy's Largest Root	1.878	80.197[b]	7.000	299.000	.000	.652	561.380	1.000
ALI_Mean	Pillai's Trace	.479	39.224[b]	7.000	299.000	.000	.479	274.570	1.000
	Wilks' Lambda	.521	39.224[b]	7.000	299.000	.000	.479	274.570	1.000
	Hotelling's Trace	.918	39.224[b]	7.000	299.000	.000	.479	274.570	1.000
	Roy's Largest Root	.918	39.224[b]	7.000	299.000	.000	.479	274.570	1.000
Survey_Year	Pillai's Trace	.030	1.323[b]	7.000	299.000	.239	.030	9.258	.562
	Wilks' Lambda	.970	1.323[b]	7.000	299.000	.239	.030	9.258	.562
	Hotelling's Trace	.031	1.323[b]	7.000	299.000	.239	.030	9.258	.562
	Roy's Largest Root	.031	1.323[b]	7.000	299.000	.239	.030	9.258	.562

a. Design: Intercept + ALI Mean + Survey Year

b. Exact statistic

c. Computed using alpha = .05

a

Levene's Test of Equality of Error Variances

	F	df1	df2		Sig.
NOSACQ_Dim1	.006	1	306	.941	
NOSACQ_Dim2	.428	1	306	.514	
NOSACQ_Dim3	.004	1	306	.949	
NOSACQ_Dim4	.214	1	306	.644	
NOSACQ_Dim5	.705	1	306	.402	
NOSACQ_Dim6	.327	1	306	.568	
NOSACQ_Dim7	.978	1	306	.324	

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + ALI_Mean + Survey_Year

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[h]
Corrected Model	NOSACQ_Dim1	39.631[a]	2	19.815	108.248	.000	.415	216.496	1.000
	NOSACQ_Dim2	35.422[b]	2	17.711	105.141	.000	.408	210.282	1.000
	NOSACQ_Dim3	36.664[c]	2	18.332	94.890	.000	.384	189.781	1.000
	NOSACQ_Dim4	16.107[d]	2	8.054	46.851	.000	.235	93.703	1.000
	NOSACQ_Dim5	14.886[e]	2	7.443	39.104	.000	.204	78.208	1.000
	NOSACQ_Dim6	21.328[f]	2	10.664	59.273	.000	.280	118.547	1.000
	NOSACQ_Dim7	11.270[g]	2	5.635	30.070	.000	.165	60.141	1.000
Intercept	NOSACQ_Dim1	39.968	1	39.968	218.339	.000	.417	218.339	1.000
	NOSACQ_Dim2	40.409	1	40.409	239.888	.000	.440	239.888	1.000
	NOSACQ_Dim3	37.576	1	37.576	194.502	.000	.389	194.502	1.000
	NOSACQ_Dim4	71.606	1	71.606	416.564	.000	.577	416.564	1.000
	NOSACQ_Dim5	69.912	1	69.912	367.309	.000	.546	367.309	1.000
	NOSACQ_Dim6	62.990	1	62.990	350.109	.000	.534	350.109	1.000
	NOSACQ_Dim7	87.355	1	87.355	466.143	.000	.604	466.143	1.000
ALI_Mean	NOSACQ_Dim1	39.082	1	39.082	213.499	.000	.412	213.499	1.000
	NOSACQ_Dim2	35.393	1	35.393	210.108	.000	.408	210.108	1.000
	NOSACQ_Dim3	36.603	1	36.603	189.465	.000	.383	189.465	1.000
	NOSACQ_Dim4	15.749	1	15.749	91.620	.000	.231	91.620	1.000
	NOSACQ_Dim5	14.678	1	14.678	77.116	.000	.202	77.116	1.000
	NOSACQ_Dim6	21.294	1	21.294	118.356	.000	.280	118.356	1.000
	NOSACQ_Dim7	11.203	1	11.203	59.779	.000	.164	59.779	1.000
Survey_Year	NOSACQ_Dim1	.646	1	.646	3.531	.061	.011	3.531	.465
	NOSACQ_Dim2	.053	1	.053	.317	.574	.001	.317	.087
	NOSACQ_Dim3	.095	1	.095	.491	.484	.002	.491	.108
	NOSACQ_Dim4	.408	1	.408	2.371	.125	.008	2.371	.336
	NOSACQ_Dim5	.245	1	.245	1.285	.258	.004	1.285	.204
	NOSACQ_Dim6	.054	1	.054	.299	.585	.001	.299	.085
	NOSACQ_Dim7	.051	1	.051	.274	.601	.001	.274	.082

Error	NOSACQ_Dim1	55.832	305	.183
	NOSACQ_Dim2	51.377	305	.168
	NOSACQ_Dim3	58.924	305	.193
	NOSACQ_Dim4	52.428	305	.172
	NOSACQ_Dim5	58.052	305	.190
	NOSACQ_Dim6	54.874	305	.180
	NOSACQ_Dim7	57.157	305	.187
Total	NOSACQ_Dim1	3468.235	308	
	NOSACQ_Dim2	3319.653	308	
	NOSACQ_Dim3	3260.611	308	
	NOSACQ_Dim4	3392.583	308	
	NOSACQ_Dim5	3271.633	308	
	NOSACQ_Dim6	3457.438	308	
	NOSACQ_Dim7	3543.551	308	
Corrected Total	NOSACQ_Dim1	95.462	307	
	NOSACQ_Dim2	86.800	307	
	NOSACQ_Dim3	95.588	307	
	NOSACQ_Dim4	68.536	307	
	NOSACQ_Dim5	72.938	307	
	NOSACQ_Dim6	76.203	307	
	NOSACQ_Dim7	68.428	307	

a. R Squared = .415 (Adjusted R Squared = .411)

b. R Squared = .408 (Adjusted R Squared = .404)

c. R Squared = .384 (Adjusted R Squared = .380)

d. R Squared = .235 (Adjusted R Squared = .230)

e. R Squared = .204 (Adjusted R Squared = .199)

f. R Squared = .280 (Adjusted R Squared = .275)

g. R Squared = .165 (Adjusted R Squared = .159)

h. Computed using alpha = .05

Appendix K

SPSS Outputs – Poisson Regressions

Compliance – Work Site Reviews Completed (Com_WSR)

Model Information

Dependent Variable	Com_WSR
Probability Distribution	Poisson
Link Function	Log

Case Processing Summary

N		Percent
Included	24	88.9%
Excluded	3	11.1%
Total	27	100.0%

Categorical Variable Information

	N		Percent
Factor Survey Year 2018		12	50.0%
	2017	12	50.0%
	Total	24	100.0%

Continuous Variable Information

	N		Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	Com WSR	24	.00	163.00	23.3750	39.62631
Covariate	NOSACQ	24	2.97	3.80	3.3025	.21598
	ALI	24	2.69	4.78	3.8625	.49552

Goodness of Fit[a]

	Value	df	Value/df
Deviance	946.322	20	47.316
Scaled Deviance	946.322	20	
Pearson Chi-Square	1317.980	20	65.899
caled Pearson Chi-Square	1317.980	20	
Log Likelihood[b]	-515.515		
Akaike's Information Criterion (AIC)	1039.029		

Finite Sample Corrected AIC (AICC)	1041.135		
Bayesian Information Criterion (BIC)	1043.742		
Consistent AIC (CAIC)	1047.742		

Dependent Variable: Com_WSR
Model: (Intercept), Survey Year, NOSACQ, ALI[a]

a. Information criteria are in smaller-is-better form.

b. The full log likelihood function is displayed and used in computing information criteria.

Omnibus Test[a]

Likelihood Ratio Chi-Square	df	Sig.
85.969	3	.000

Dependent Variable: Com_WSR

Model: (Intercept), Survey Year, NOSACQ, ALI[a]

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

	Type III		
Source	Wald Chi-Square	df	Sig.
(Intercept)	54.926	1	.000
Survey Year	23.322	1	.000
NOSACQ	45.489	1	.000
ALI	62.657	1	.000

Dependent Variable: Com_WSR

Model: (Intercept), Survey Year, NOSACQ, ALI

Parameter Estimates

			95% Wald Confidence Interval		Hypothesis Test				95% Wald Confidence	
Parameter	B	Std. Error	Lower	Upper	Wald Chi-Square	df	Sig.	Exp(B)	Lower	Upper
(Intercept)	4.941	.6887	3.591	6.291	51.477	1	.000	139.913	36.280	539.580
[Survey Year=2.00]	.439	.0909	.261	.617	23.322	1	.000	1.551	1.298	1.854
[Survey Year=1.00]	0[a]	.	.	.	.	.	.	1	.	.

NOSACQ	-2.307	.3421	-2.977	-1.637	45.489	1	.000	.100	.051	.195
ALI	1.428	.1804	1.074	1.781	62.657	1	.000	4.170	2.928	5.938
(Scale)	1[b]									

Dependent Variable: Com_WSR

Model: (Intercept), Survey Year, NOSACQ, ALI

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Compliance – Incidents Reported (Com_Inc)

Model Information

Dependent Variable	Com Inc
Probability Distribution	Poisson
Link Function	Log

Case Processing Summary

N		Percent
Included	24	88.9%
Excluded	3	11.1%
Total	27	100.0%

Categorical Variable Information

	N		Percent
Factor Survey Year 2018		12	50.0%
	2017	12	50.0%
	Total	24	100.0%

Continuous Variable Information

	N		Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	Com Inc	24	.00	41.00	10.3333	12.00604
Covariate	NOSACQ	24	2.97	3.80	3.3025	.21598
	ALI	24	2.69	4.78	3.8625	.49552

Goodness of Fit[a]

	Value	df	Value/df
Deviance	240.820	20	12.041
Scaled Deviance	240.820	20	
Pearson Chi-Square	231.133	20	11.557
Scaled Pearson Chi-Square	231.133	20	
Log Likelihood[b]	-159.718		
Akaike's Information Criterion (AIC)	327.437		
Finite Sample Corrected AIC (AICC)	329.542		
Bayesian Information Criterion (BIC)	332.149		
Consistent AIC (CAIC)	336.149		

Dependent Variable: Com_Inc
Model: (Intercept), Survey Year, NOSACQ, ALI[a]

a. Information criteria are in smaller-is-better form.

b. The full log likelihood function is displayed and used in computing information criteria.

Omnibus Test[a]

Likelihood Ratio Chi-Square	df	Sig.
55.522	3	.000

Dependent Variable: Com_Inc

Model: (Intercept), Survey Year, NOSACQ, ALI[a]

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

	Type III		
Source	Wald Chi-Square	df	Sig.
(Intercept)	61.764	1	.000
Survey Year	4.572	1	.032
NOSACQ	50.560	1	.000
ALI	30.169	1	.000

Dependent Variable: Com_Inc

Model: (Intercept), Survey Year, NOSACQ, ALI

Parameter Estimates

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test			Exp(B)	95% Wald Confidence ...
			Lower	Upper	Wald Chi-Square	df	Sig.		Lower
(Intercept)	8.674	1.1101	6.499	10.850	61.064	1	.000	5851.457	664.314
[Survey Year=2.00]	.294	.1376	.025	.564	4.572	1	.032	1.342	1.025
[Survey Year=1.00]	0[a]	.	.	.	.	.	.	1	.
NOSACQ	-3.596	.5057	-4.587	-2.604	50.560	1	.000	.027	.010
ALI	1.364	.2483	.877	1.850	30.169	1	.000	3.910	2.404
(Scale)	1[b]								

Parameter Estimates

Parameter	95% Wald Confidence ... Upper
(Intercept)	51541.202
[Survey Year=2.00]	1.758
[Survey Year=1.00]	.
NOSACQ	.074
ALI	6.361
(Scale)	

Dependent Variable: Com_Inc

Model: (Intercept), Survey Year, NOSACQ, ALI

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Compliance – Near Misses Reports (Com_NM)

Model Information

Dependent Variable	Com_NM
Probability Distribution	Poisson
Link Function	Log

Case Processing Summary

N		Percent
Included	24	88.9%
Excluded	3	11.1%
Total	27	100.0%

Categorical Variable Information

	N		Percent
Factor Survey Year 2018		12	50.0%
	2017	12	50.0%
	Total	24	100.0%

Continuous Variable Information

	N		Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	Com NM	24	.00	22.00	3.2083	5.10736
Covariate	NOSACQ	24	2.97	3.80	3.3025	.21598
	ALI	24	2.69	4.78	3.8625	.49552

Goodness of Fit[a]

	Value	df	Value/df
Deviance	125.407	20	6.270
Scaled Deviance	125.407	20	
Pearson Chi-Square	128.448	20	6.422
Scaled Pearson Chi-Square	128.448	20	
Log Likelihood[b]	-84.024		
Akaike's Information Criterion (AIC)	176.049		
Finite Sample Corrected AIC (AICC)	178.154		
Bayesian Information Criterion (BIC)	180.761		
Consistent AIC (CAIC)	184.761		

Dependent Variable: Com_NM
Model: (Intercept), Survey Year, NOSACQ, ALI[a]

a. Information criteria are in smaller-is-better form.

b. The full log likelihood function is displayed and used in computing information criteria.

Omnibus Test[a]

Likelihood Ratio Chi-Square	df	Sig.
23.813	3	.000

Dependent Variable: Com_NM

Model: (Intercept), Survey Year, NOSACQ, ALI[a]

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

	Type III		
Source	Wald Chi-Square	df	Sig.
(Intercept)	14.081	1	.000
Survey Year	6.942	1	.008
NOSACQ	18.193	1	.000
ALI	13.291	1	.000

Dependent Variable: Com_NM

Model: (Intercept), Survey Year, NOSACQ, ALI

Parameter Estimates

			95% Wald Confidence Interval		Hypothesis Test				95% Wald Confidence ...
Parameter	B	Std. Error	Lower	Upper	Wald Chi-Square	df	Sig.	Exp(B)	Lower
(Intercept)	7.226	1.9886	3.328	11.123	13.204	1	.000	1374.504	27.891
[Survey Year=2.00]	.686	.2603	.176	1.196	6.942	1	.008	1.985	1.192
[Survey Year=1.00]	0[a]	.	.	.	.	.	.	1	.
NOSACQ	-4.207	.9862	-6.139	-2.274	18.193	1	.000	.015	.002
ALI	1.889	.5183	.874	2.905	13.291	1	.000	6.616	2.396
(Scale)	1[b]								

Parameter Estimates

Parameter	95% Wald Confidence ... Upper
(Intercept)	67736.348
[Survey Year=2.00]	3.307
[Survey Year=1.00]	.
NOSACQ	.103
ALI	18.270
(Scale)	

Dependent Variable: Com_NM

Model: (Intercept), Survey Year, NOSACQ, ALI

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Compliance – Hazards Reported (Com_Hazard)

Model Information

Dependent Variable	Com_Hazard
Probability Distribution	Poisson
Link Function	Log

Case Processing Summary

N		Percent
Included	24	88.9%
Excluded	3	11.1%
Total	27	100.0%

Categorical Variable Information

		N	Percent
Factor Survey Year 2018		12	50.0%
	2017	12	50.0%
	Total	24	100.0%

Continuous Variable Information

	N		Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	Com Hazard	24	.00	396.00	50.7917	82.83508
Covariate	NOSACQ	24	2.97	3.80	3.3025	.21598
	ALI	24	2.69	4.78	3.8625	.49552

Goodness of Fit[a]

	Value	df	Value/df
Deviance	1762.328	20	88.116
Scaled Deviance	1762.328	20	
Pearson Chi-Square	2410.568	20	120.528
Scaled Pearson Chi-Square	2410.568	20	
Log Likelihood[b]	-938.642		
Akaike's Information Criterion (AIC)	1885.285		
Finite Sample Corrected AIC (AICC)	1887.390		
Bayesian Information Criterion (BIC)	1889.997		
Consistent AIC (CAIC)	1893.997		

Dependent Variable: Com_Hazard
Model: (Intercept), Suvey Year, NOSACQ, ALI[a]

a. Information criteria are in smaller-is-better form.

b. The full log likelihood function is displayed and used in computing information criteria.

Omnibus Test[a]

Likelihood Ratio Chi-Square	df	Sig.
157.816	3	.000

Dependent Variable: Com_Hazard

Model: (Intercept), Survey Year, NOSACQ, ALI[a]

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

	Type III		
Source	Wald Chi-Square	df	Sig.
(Intercept)	111.021	1	.000
Survey Year	36.566	1	.000
NOSACQ	64.701	1	.000
ALI	116.154	1	.000

Dependent Variable: Com_Hazard

Model: (Intercept), Survey Year, NOSACQ, ALI

Parameter Estimates

			95% Wald Confidence Interval		Hypothesis Test				95% Wald Confidence ...
Parameter	B	Std. Error	Lower	Upper	Wald Chi-Square	df	Sig.	Exp(B)	Lower
(Intercept)	4.747	.4632	3.839	5.654	105.025	1	.000	115.198	46.472
[Survey Year=2.00]	.368	.0609	.249	.488	36.566	1	.000	1.445	1.283
[Survey Year=1.00]	0[a]	.	.	.	.	.	.	1	.
NOSACQ	-1.838	.2285	-2.285	-1.390	64.701	1	.000	.159	.102
ALI	1.291	.1198	1.056	1.526	116.154	1	.000	3.636	2.875
(Scale)	1[b]								

Parameter Estimates

	95% Wald Confidence ...
Parameter	Upper
(Intercept)	285.559
[Survey Year=2.00]	1.628
[Survey Year=1.00]	.
NOSACQ	.249
ALI	4.598
(Scale)	

Dependent Variable: Com_Hazard

Model: (Intercept), Survey Year, NOSACQ, ALI

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Participation – Number of Work Site Reviews Contributors (Par_WSRC)

Model Information

Dependent Variable	Par_WSRC
Probability Distribution	Poisson
Link Function	Log

Case Processing Summary

N		Percent
Included	24	88.9%
Excluded	3	11.1%
Total	27	100.0%

Categorical Variable Information

	N		Percent
Factor Survey Year 2018		12	50.0%
	2017	12	50.0%
	Total	24	100.0%

Continuous Variable Information

	N		Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	Par_WSRC	24	.00	15.00	3.1250	3.88209
Covariate	NOSACQ	24	2.97	3.80	3.3025	.21598
	ALI	24	2.69	4.78	3.8625	.49552

Goodness of Fit[a]

	Value	df	Value/df
Deviance	77.471	20	3.874
Scaled Deviance	77.471	20	
Pearson Chi-Square	86.491	20	4.325
Scaled Pearson Chi-Square	86.491	20	
Log Likelihood[b]	-66.886		
Akaike's Information Criterion (AIC)	141.771		
Finite Sample Corrected AIC (AICC)	143.876		
Bayesian Information Criterion (BIC)	146.483		
Consistent AIC (CAIC)	150.483		

Dependent Variable: Par_WSRC
Model: (Intercept), Survey Year, NOSACQ, ALI[a]

a. Information criteria are in smaller-is-better form.

b. The full log likelihood function is displayed and used in computing information criteria.

Omnibus Test[a]

Likelihood Ratio Chi-Square	df	Sig.
10.265	3	.016

Dependent Variable: Par_WSRC

Model: (Intercept), Survey Year, NOSACQ, ALI[a]

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

	Type III		
Source	Wald Chi-Square	df	Sig.
(Intercept)	2.385	1	.122
Survey Year	1.077	1	.299
NOSACQ	5.756	1	.016
ALI	8.300	1	.004

Dependent Variable: Par_WSRC

Model: (Intercept), Survey Year, NOSACQ, ALI

Parameter Estimates

			95% Wald Confidence Interval		Hypothesis Test				95% Wald Confidence ...
Parameter	B	Std. Error	Lower	Upper	Wald Chi-Square	df	Sig.	Exp(B)	Lower
(Intercept)	2.792	1.8704	-.874	6.458	2.228	1	.135	16.315	.417
[Survey Year=2.00]	.255	.2457	-.227	.737	1.077	1	.299	1.290	.797
[Survey Year=1.00]	0[a]	.	.	.	.	.	.	1	.
NOSACQ	-2.187	.9117	-3.974	-.400	5.756	1	.016	.112	.019
ALI	1.388	.4817	.444	2.332	8.300	1	.004	4.006	1.558
(Scale)	1[b]								

Parameter Estimates

Parameter	95% Wald Confidence ... Upper
(Intercept)	637.717
[Survey Year=2.00]	2.089
[Survey Year=1.00]	.
NOSACQ	.670
ALI	10.298
(Scale)	

Dependent Variable: Par_WSRC

Model: (Intercept), Survey Year, NOSACQ, ALI

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Participation – Number of Hazard Report Contributors (Par_HAZC)

Model Information

Dependent Variable	Par_HAZC
Probability Distribution	Poisson
Link Function	Log

Case Processing Summary

N		Percent
Included	24	88.9%
Excluded	3	11.1%
Total	27	100.0%

Categorical Variable Information

	N		Percent
Factor Survey Year 2018		12	50.0%
	2017	12	50.0%
	Total	24	100.0%

Continuous Variable Information

	N		Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	Par_HAZC	24	.00	40.00	10.6667	10.63083
Covariate	NOSACQ	24	2.97	3.80	3.3025	.21598
	ALI	24	2.69	4.78	3.8625	.49552

Goodness of Fit[a]

	Value	df	Value/df
Deviance	178.619	20	8.931
Scaled Deviance	178.619	20	
Pearson Chi-Square	190.696	20	9.535
Scaled Pearson Chi-Square	190.696	20	
Log Likelihood[b]	-133.945		
Akaike's Information Criterion (AIC)	275.890		
Finite Sample Corrected AIC (AICC)	277.995		
Bayesian Information Criterion (BIC)	280.602		
Consistent AIC (CAIC)	284.602		

Dependent Variable: Par_HAZC
Model: (Intercept), Survey Year, NOSACQ, ALI[a]

a. Information criteria are in smaller-is-better form.

b. The full log likelihood function is displayed and used in computing information criteria.

Omnibus Test[a]

Likelihood Ratio Chi-Square	df	Sig.
27.338	3	.000

Dependent Variable: Par_HAZC

Model: (Intercept), Survey Year, NOSACQ, ALI[a]

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

	Type III		
Source	Wald Chi-Square	df	Sig.
(Intercept)	7.388	1	.007
Survey Year	.043	1	.835
NOSACQ	9.697	1	.002

ALI	21.584	1	.000

Dependent Variable: Par_HAZC

Model: (Intercept), Survey Year, NOSACQ, ALI

Parameter Estimates

			95% Wald Confidence Interval		Hypothesis Test				95% Wald Confidence ...
Parameter	B	Std. Error	Lower	Upper	Wald Chi-Square	df	Sig.	Exp(B)	Lower
(Intercept)	2.735	1.0020	.771	4.699	7.452	1	.006	15.413	2.163
[Survey Year=2.00]	.027	.1307	-.229	.283	.043	1	.835	1.028	.795
[Survey Year=1.00]	0[a]	.	.	.	.	.	.	1	.
NOSACQ	-1.478	.4747	-2.409	-.548	9.697	1	.002	.228	.090
ALI	1.149	.2473	.664	1.634	21.584	1	.000	3.155	1.943
(Scale)	1[b]								

Parameter Estimates

	95% Wald Confidence ...
Parameter	Upper
(Intercept)	109.846
[Survey Year=2.00]	1.328
[Survey Year=1.00]	.
NOSACQ	.578
ALI	5.122
(Scale)	

Dependent Variable: Par_HAZC

Model: (Intercept), Survey Year, NOSACQ, ALI

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Participation – Number of Safety Conversations Recorded (Par_SC)

Model Information

Dependent Variable	Par_SC
Probability Distribution	Poisson
Link Function	Log

Case Processing Summary

N		Percent
Included	24	88.9%
Excluded	3	11.1%
Total	27	100.0%

Categorical Variable Information

	N		Percent
Factor Survey Year 2018		12	50.0%
	2017	12	50.0%
	Total	24	100.0%

Continuous Variable Information

	N		Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	Par_SC	24	5.00	3045.00	378.4167	706.59335
Covariate	NOSACQ	24	2.97	3.80	3.3025	.21598
	ALI	24	2.69	4.78	3.8625	.49552

Goodness of Fit[a]

	Value	df	Value/df
Deviance	14628.346	20	731.417
Scaled Deviance	14628.346	20	
Pearson Chi-Square	22393.786	20	1119.689
Scaled Pearson Chi-Square	22393.786	20	
Log Likelihood[b]	-7395.290		
Akaike's Information Criterion (AIC)	14798.579		
Finite Sample Corrected AIC (AICC)	14800.685		
Bayesian Information Criterion (BIC)	14803.292		
Consistent AIC (CAIC)	14807.292		

Dependent Variable: Par_SC
Model: (Intercept), Survey Year, NOSACQ, ALI[a]

a. Information criteria are in smaller-is-better form.

b. The full log likelihood function is displayed and used in computing information criteria.

Omnibus Test[a]

Likelihood Ratio Chi-Square	df	Sig.
2208.372	3	.000

Dependent Variable: Par_SC

Model: (Intercept), Survey Year, NOSACQ, ALI[a]

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

	Type III		
Source	Wald Chi-Square	df	Sig.
(Intercept)	3995.042	1	.000
Survey Year	257.935	1	.000
NOSACQ	1848.819	1	.000
ALI	1420.099	1	.000

Dependent Variable: Par_SC

Model: (Intercept), Survey Year, NOSACQ, ALI
Parameter Estimates

			95% Wald Confidence Interval		Hypothesis Test				95% Wald Confidence ...
Parameter	B	Std. Error	Lower	Upper	Wald Chi-Square	df	Sig.	Exp(B)	Lower
(Intercept)	11.232	.1784	10.882	11.581	3963.523	1	.000	75491.581	53215.685
[Survey Year=2.00]	.371	.0231	.326	.417	257.935	1	.000	1.450	1.385
[Survey Year=1.00]	0[a]	.	.	.	.	.	.	1	.
NOSACQ	-3.687	.0858	-3.855	-3.519	1848.819	1	.000	.025	.021
ALI	1.697	.0450	1.609	1.785	1420.099	1	.000	5.458	4.997
(Scale)	1[b]								

Parameter Estimates

Parameter	95% Wald Confidence ... Upper
(Intercept)	107092.087
[Survey Year=2.00]	1.517
[Survey Year=1.00]	.
NOSACQ	.030
ALI	5.961
(Scale)	

Dependent Variable: Par_SC

Model: (Intercept), Survey Year, NOSACQ, ALI

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Participation – Number of Safety Conversation Contributors (Par_SCC)

Model Information

Dependent Variable	Par SCC
Probability Distribution	Poisson
Link Function	Log

Case Processing Summary

N		Percent
Included	24	88.9%
Excluded	3	11.1%
Total	27	100.0%

Categorical Variable Information

	N		Percent
Factor Survey Year 2018		12	50.0%
	2017	12	50.0%
	Total	24	100.0%

Continuous Variable Information

	N		Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	Par_SCC	24	1.00	46.00	13.8333	11.29704
Covariate	NOSACQ	24	2.97	3.80	3.3025	.21598
	ALI	24	2.69	4.78	3.8625	.49552

Goodness of Fit[a]

	Value	df	Value/df
Deviance	157.900	20	7.895
Scaled Deviance	157.900	20	
Pearson Chi-Square	164.250	20	8.213
Scaled Pearson Chi-Square	164.250	20	
Log Likelihood[b]	-128.992		
Akaike's Information Criterion (AIC)	265.984		
Finite Sample Corrected AIC (AICC)	268.089		
Bayesian Information Criterion (BIC)	270.696		
Consistent AIC (CAIC)	274.696		

Dependent Variable: Par_SCC
Model: (Intercept), Survey Year, NOSACQ, ALI[a]

a. Information criteria are in smaller-is-better form.

b. The full log likelihood function is displayed and used in computing information criteria.

Omnibus Test[a]

Likelihood Ratio Chi-Square	df	Sig.
29.428	3	.000

Dependent Variable: Par_SCC

Model: (Intercept), Survey Year, NOSACQ, ALI[a]

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

Source	Type III Wald Chi-Square	df	Sig.
(Intercept)	31.539	1	.000
Survey Year	5.711	1	.017
NOSACQ	21.317	1	.000
ALI	22.989	1	.000

Dependent Variable: Par_SCC

Model: (Intercept), Survey Year, NOSACQ, ALI

Parameter Estimates

Parameter	B	Std. Error	95% Wald Confidence Interval Lower	Upper	Hypothesis Test Wald Chi-Square	df	Sig.	Exp(B)	95% Wald Confidence ... Lower
(Intercept)	5.017	.9100	3.233	6.801	30.394	1	.000	150.971	25.367
[Survey Year=2.00]	.275	.1153	.050	.501	5.711	1	.017	1.317	1.051
[Survey Year=1.00]	0[a]	.	.	.	.	.	.	1	.
NOSACQ	-1.954	.4232	-2.783	-1.124	21.317	1	.000	.142	.062
ALI	1.003	.2092	.593	1.413	22.989	1	.000	2.727	1.809
(Scale)	1[b]								

Parameter Estimates

Parameter	95% Wald Confidence ... Upper
(Intercept)	898.503
[Survey Year=2.00]	1.651
[Survey Year=1.00]	.
NOSACQ	.325
ALI	4.109
(Scale)	

Dependent Variable: Par_SCC

Model: (Intercept), Survey Year, NOSACQ, ALI

a. Set to zero because this parameter is redundant.
b. Fixed at the displayed value.

Occupational Injuries – Number of Total Recordable Injuries (Inj_TRI)

Model Information

Dependent Variable	Inj TRI
Probability Distribution	Poisson
Link Function	Log

Case Processing Summary

N		Percent
Included	24	88.9%
Excluded	3	11.1%
Total	27	100.0%

Categorical Variable Information

	N		Percent
Factor Survey Year 2018		12	50.0%
	2017	12	50.0%
	Total	24	100.0%

Continuous Variable Information

	N		Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	Inj TRI	24	.00	1.00	.2083	.41485
Covariate	NOSACQ	24	2.97	3.80	3.3025	.21598
	ALI	24	2.69	4.78	3.8625	.49552

Goodness of Fit[a]

	Value	df	Value/df
Deviance	12.649	20	.632
Scaled Deviance	12.649	20	
Pearson Chi-Square	13.435	20	.672
Scaled Pearson Chi-Square	13.435	20	
Log Likelihood[b]	-11.325		
Akaike's Information Criterion (AIC)	30.649		
Finite Sample Corrected AIC (AICC)	32.755		
Bayesian Information Criterion (BIC)	35.361		
Consistent AIC (CAIC)	39.361		

Dependent Variable: Inj_TRI
Model: (Intercept), Survey Year, NOSACQ, ALI[a]

a. Information criteria are in smaller-is-better form.
b. The full log likelihood function is displayed and used in computing information criteria.

Omnibus Test[a]

Likelihood Ratio Chi-Square	df	Sig.
3.037	3	.386

Dependent Variable: Inj_TRI

Model: (Intercept), Survey Year, NOSACQ, ALI[a]

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

	Type III		
Source	Wald Chi-Square	df	Sig.
(Intercept)	.586	1	.444
Survey Year	.024	1	.876
NOSACQ	2.169	1	.141
ALI	1.517	1	.218

Dependent Variable: Inj_TRI

Model: (Intercept), Survey Year, NOSACQ, ALI

Parameter Estimates

			95% Wald Confidence Interval		Hypothesis Test				95% Wald Confidence ...
Parameter	B	Std. Error	Lower	Upper	Wald Chi-Square	df	Sig.	Exp(B)	Lower
(Intercept)	5.850	7.6282	-9.101	20.801	.588	1	.443	347.254	.000
[Survey Year=2.00]	.168	1.0807	-1.950	2.286	.024	1	.876	1.183	.142
[Survey Year=1.00]	0[a]	.	.	.	.	.	.	1	.
NOSACQ	-5.710	3.8768	-13.308	1.889	2.169	1	.141	.003	1.661E-6
ALI	2.848	2.3121	-1.684	7.379	1.517	1	.218	17.248	.186
(Scale)	1[b]								

Parameter Estimates

Parameter	95% Wald Confidence ... Upper
(Intercept)	1080985378
[Survey Year=2.00]	9.838
[Survey Year=1.00]	.
NOSACQ	6.611
ALI	1602.632
(Scale)	

Dependent Variable: Inj_TRI

Model: (Intercept), Survey Year, NOSACQ, ALI

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Occupational Injuries – Number of All Injuries Reported (Inj_All)

Model Information

Dependent Variable	Inj All
Probability Distribution	Poisson
Link Function	Log

Case Processing Summary

N		Percent
Included	24	88.9%
Excluded	3	11.1%
Total	27	100.0%

Categorical Variable Information

	N		Percent
Factor Survey Year 2018		12	50.0%
	2017	12	50.0%
	Total	24	100.0%

Continuous Variable Information

	N		Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	Inj_All	24	.00	14.00	3.1250	3.88209
Covariate	NOSACQ	24	2.97	3.80	3.3025	.21598
	ALI	24	2.69	4.78	3.8625	.49552

Goodness of Fit[a]

	Value	df	Value/df
Deviance	61.691	20	3.085
Scaled Deviance	61.691	20	
Pearson Chi-Square	52.929	20	2.646
Scaled Pearson Chi-Square	52.929	20	
Log Likelihood[b]	-57.234		
Akaike's Information Criterion (AIC)	122.468		
Finite Sample Corrected AIC (AICC)	124.573		
Bayesian Information Criterion (BIC)	127.180		
Consistent AIC (CAIC)	131.180		

Dependent Variable: Inj_All
Model: (Intercept), Survey Year, NOSACQ, ALI[a]

a. Information criteria are in smaller-is-better form.

b. The full log likelihood function is displayed and used in computing information criteria.

Omnibus Test[a]

Likelihood Ratio Chi-Square	df	Sig.
38.043	3	.000

Dependent Variable: Inj_All

Model: (Intercept), Survey Year, NOSACQ, ALI[a]

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

Source	Type III Wald Chi-Square	df	Sig.
(Intercept)	32.092	1	.000
Survey Year	6.516	1	.011
NOSACQ	29.405	1	.000
ALI	10.774	1	.001

Dependent Variable: Inj_All

Model: (Intercept), Survey Year, NOSACQ, ALI

Parameter Estimates

Parameter	B	Std. Error	95% Wald Confidence Interval Lower	95% Wald Confidence Interval Upper	Hypothesis Test Wald Chi-Square	df	Sig.	Exp(B)	95% Wald Confidence ... Lower
(Intercept)	13.499	2.4068	8.782	18.216	31.458	1	.000	728820.779	6515.365
[Survey Year=2.00]	.675	.2644	.157	1.193	6.516	1	.011	1.964	1.170
[Survey Year=1.00]	0[a]	.	.	.	.	.	.	1	.
NOSACQ	-5.622	1.0368	-7.654	-3.590	29.405	1	.000	.004	.000
ALI	1.440	.4388	.580	2.300	10.774	1	.001	4.222	1.787
(Scale)	1[b]								

Parameter Estimates

Parameter	95% Wald Confidence ... Upper
(Intercept)	81527235.78
[Survey Year=2.00]	3.297
[Survey Year=1.00]	.
NOSACQ	.028
ALI	9.977
(Scale)	

Dependent Variable: Inj_All

Model: (Intercept), Survey Year, NOSACQ, ALI
a. Set to zero because this parameter is redundant.
b. Fixed at the displayed value.

Appendix L

Transcripts

Focus Group Transcripts
E.1.1 Focus Group A

Date: 7 February 2019
Location: Brooklyn, VIC
Speakers: Nine (including Researcher)
Duration: 46 Minutes 48 Seconds

Researcher: [00:01:05] So to start off with, you should all have a couple of graphs on the first page. So, this really covers off some of the key information and demographics and I don't think we need to spend too much time on it. But I'll sort of describe what you can see. On the top left, we've got our years of service or tenure of our staff, at the top right is our age demographics of how people identify how old they are and on the bottom left to the right we've got gender, whether we're full time or part-time, the breakup of the workforce, whether or not they are a manager or supervisor and what that management or supervision sort of role.

Participant A1: [00:02:27] Clearly a bit top-heavy.

Researcher: [00:02:28] Yep. And also, the contracts that have come from or identified to have come from. So, because it was an online survey, someone could have clicked. Yes, I'm male and I work at City West Water and I've been here for three years. And they're female they work at Energy Australia and they've been around for 10 years. I don't know that information it's just sort of bundled up into here. So, it's whatever people have self-identified as being. But is there anything that stands out from that, from your perspective that might not be?

Participant A2: [00:03:07] Sorry, what was the yes/no one?

Researcher: [00:03:07] Whether they're a manager or supervisor of people.

Participant A1: [00:03:15] Is there anything about the labour split? So, you've got executive manager, operational contract manager, coordinator, supervisor. Is there no trades, no crews?

Researcher: [00:03:27] So the, I guess the question was around. I mean, the split in the admin and trades type was maybe 60:30/70:30. In that third graph on the bottom left. So that's the split there for trades. And then if they've identified as a manager or supervisor, or it could be a like a team coordinator all that yellow part of the supervisory role.

Participant A1: [00:03:55] So you got 50 trades, labour / field people. Which is good.

Researcher: [00:03:59] It's an increase on the previous 2017 data.

Participant A1: [00:04:07] Yeah.

Researcher: [00:04:07] That's obviously a notable difference, is that less trades have been involved in the feedback. And probably the other one so stands out for me was probably a representation of the table here as well is that we've got a majority of the male responses versus female responses. That's one of the things that sort of stands out to me. Anything else from a demographic perspective? Otherwise I can move on to the next section. So, on the second page and the third page

I've got two graphs, they look the same, except they've got blue and orange bar graphs. One was from the 2017 survey that was done in I think September give or take around September/October 2017. And the second one is from November 2018 and the survey questions are responded around two things. So, one around the leader's leadership style and the other was around whether or not you think there's a safe culture in the workplace or safety climate survey. So, the blue graph represents the Safety Climate score for a particular contract. And then the orange is a rating of safety leadership or the leadership style specifically around authenticity. And I sort of match those up or paired those for each of those contracts. What you will notice is that there's more contracts in 2017 than there are in 2018. There's been some organizational changes across that that time period. I was presenting that as some initial information for people to look out if there's anything that stands out.

Participant A2: [00:06:11] As long as we're not 'I'. I guess that's important.

Researcher: [00:06:13] I don't believe you are 'I'. But that's why I've deidentified it.

Participant A1: [00:06:21] It's interesting that 'N' with backwards a little bit and 'M' went up in their authentic leadership. Interesting to see if there was change of management or major process change or restructuring.

Researcher: [00:06:40] It has been a little bit of organizational change over the last twelve months.

Participant A1: [00:06:45] 'H' is the same, 'H' has gone right up.

Researcher: [00:06:55] I've sort of tried to see if there's any correlation between the size or the volume of the orange compared to the blue. So is there an increase in the safe climate result where there's a higher leadership score. Without going into the full details, I'm not quite sure if we're there yet, but that's something we will look into. But it's sort of the initial viewpoint. Let's say take 'C' as an example as well. 'C' has seen a decrease in its authentic leadership, but an increase in safety climate result.

Participant A2: [00:07:46] 'A's leaderships down.

Researcher: [00:07:47] 'A' leaderships taken a bit of a dive in its leadership and the safety climates sort of stays the same.

Speaker: [00:07:59] [Inaudible]

Researcher: [00:08:01] You can see you can see that some have not carried across into the 2018 survey. So, say, P and Q and R not in 2018 data set.

Participant A2: [00:08:12] Does it take into account participation rights, so say if City West Water had a higher rank one year and then a lower rank the next year. Does that skew the result or is it an average?

Researcher: [00:08:23] It may skew that result.

Participant A1: [00:08:27] If you look at P and Q, they're fairly low in comparison to others. I wonder if that has anything to do with the contracts ending in and of themselves.

Researcher: [00:08:45] So in terms of...were they aware of a contract finishing up prior or while they were doing this?

Participant A1: [00:08:49] Potentially, that could be a factor or whether because they were in the 3s, that's probably why the contract might have gone somewhere else.

Researcher: [00:09:10] Excellent, cool, thank you. We'll flip through. Just mindful of your time as well and have a look at the last two horizontal graphs. And this is a breakdown of the safety climate result based on the seven dimensions that the safety survey looked at. And then this second graph in blue was around the authentic leadership in the four dimensions of authenticity based on the survey. So, what you can see there is that the safety climate result is a combination of seven sections or elements. Three of them relate to our perceptions of our manager or our supervisor in the workplace and the last four of that relates to our colleagues in the workplace. So, do we have a sense that our fellow co-workers have a strong safety commitment and as a result come back as a 3.31, which is a relatively strong result. So that's out of 4. So pretty positive result there. What I can see is that management, safety, justice is a relatively low score compared to the rest...

Participant A1: [00:10:28] What's the safety justice? How do you define that?

Researcher: [00:10:32] So an example of a question that was on the survey is...My manager looks for a root cause rather than blaming a worker with an incident. That's an example of management safety justice. And I guess that management safety empowerment is another one that's relatively low. So, a question relating to that would be my manager gives me the authority to undertake things safely or resolve things if I see a safety issue. Is there anything that sort of resonate for anyone in those results.

Participant A1: [00:11:16] So that's across all contracts?

Researcher: [00:11:20] That's across all contracts.

Participant A1: [00:11:20] And then you're going to split it out? Was there anything interesting between contracts?

Researcher: [00:11:23] There are some variations across various contracts. But consistently, I think from memory, the managing safety justice was relatively lower compared to other aspects in the business.

Participant A1: [00:11:44] And that would link in with safety empowerment a bit too.

Researcher: [00:11:57] Does that...thinking about this particular contract? You don't have to specify examples, but do you...obviously it's fairly strong worker commitments around safety, so most people think that their colleagues work safely and it's a safe place to work from a peer perspective. Does that seem consistent with this workforce?

Participant A1: [00:12:25] I would think so.

Researcher: [00:12:30] And again, looking at the top dimension of the management safety priority and ability, does that have a sense of consistency across this contract? So, is there a level of management commitment to safety and ability to resolve those issues or provide a safe workplace? In general?

Participant A1: [00:12:50] I think if you talked with Trent and I, we would say yes, but I think it's more about how these guys perceive that, because that's more important.

Participant A2: [00:12:57] Which is kind of why I think it's...if you go to the last one workers trust and efficiency, a lot of the stuff you put in place and safety comes back as a… it's just an arse covering exercise. So, I find it funny that I would've thought that would have went hand-in-hand with management. Management systems sort of do go hand in hand. So, the fact that one's lowering the other one's higher is strange for me.

Researcher: [00:13:20] Yep. What? Why do you think, obviously the most the worker ones are over 3.3 out of 4? I'm not sure if it's a significant variation, but the workers safety priority and risk, not acceptance, seems a little bit lower than the rest of the worker answers.

Participant A1: [00:13:45] I think that's easily explained, to be honest. I think the guys are so well versed in what they do that they probably no longer see the risks.

Researcher: [00:13:57] Yep.

Participant A1: [00:13:57] Doesn't mean they're belligerent. Doesn't mean that lazy, doesn't mean they're complacent. Mean they probably no longer see the risk. Or they've dealt with those hazards in the past and they've found a way to manage with that hazard still in place. They've been doing it for so many years that they no longer worry about it. But you and I walk up and go, oh shit, look at that hazard! And they go, what hazard?

Researcher: [00:14:26] Is that fair? Is there any variations on that?

Participant A2: [00:14:31] That's probably pretty accurate description of it. Definitely.

Researcher: [00:14:35] Do you think that...one of the questions in the survey is risk taking is a part of our everyday work. Is that accurate?

Participant A2: [00:14:49] It probably depends on how you, you really define the question, because driving to the shops is risk taking in Melbourne. Probably really depends on what you're doing and who you're talking to. But even just another aspect is from a worker in perspective, you probably really get one view. You're only really seeing what you're doing. Coming into the office, you sort of start to see what other groups do. So, you might see broader bad behaviour as opposed to what you were use the same day in day out. That could be one reason why workers see themselves as safe and not really see what their partners are doing.

Participant A1: [00:15:28] There's also a lot of reinforced behaviour too, I think. So, you look at what we talked about this morning with AVDD. The guys have never been electrocuted and they've probably done the job a thousand, two thousand times. And they were asked to a little meter around to see if there's a voltage there which sometimes they don't do. And it's not because they just want to give PFM a problem, they just don't see the risk because that behaviour has been rewarded for so many years and haven't had a safety issue. So, you kind of got to understand from their perspective that that makes sense to them.

Researcher: [00:16:07] One of the hypotheses in my research is around, does a leader's approach to leading their team influence safety climate and obviously then and then organisation performance. So, the second half the survey looked at authentic leadership looking through the literature that's the one I picked out as a potential driver. And the second paragraph of the blue graph there is around the four dimensions of authentic leadership based on the research, looking at leader's self-awareness, relational transparency. Whether or not they follow an internal moral compass effectively. And do they have a balance processing approach, do they look at the information that's fully available and then make a decision based off of that. Or do they just go and make a decision without asking any questions? The strong stand out. So, this is a rating out of five for each of these aspects. The strong stand out there is that there's a level of relational transparency based on our managers and supervisors. And again, I don't know if so. I think, Rob, you have people that you look after and supervise and coordinate. I don't know if people are responding based on Rob's leadership style or based on this situation, Julian's leadership style. It could be a mixed bag to be honest.

Participant A2: [00:17:39] Whether they see Rob as a safety leader. Or when you think safety leader do you think Richard.

Researcher: [00:17:44] So does that, I mean that we can unpack that for four days, to be honest. But, generally speaking, that's the results of most of them were relatively good looking at that sort of score. Is there any correlation, do you think, between any of those elements? So relational transparency, self-awareness, balanced processing or internal moral compass or decision making that would relate back to safety climate or the safety culture of a workplace?

Participant A4: [00:18:18] Everything's looks fine in my eyes.

Researcher: [00:18:25] Or would any of those aspects, if were to improve or drop do you reckon that would impact on the rest of it.

Participant A1: [00:18:34] Look, I think from a sort of our perspective, sort of Rob and Trent and I and some extent Craig...I think we've tried hard over the last probably two years to really change the way management and the employees interact and work together. I think we've been quite targeted in doing it. It hasn't been a, we need to try and get on, we've actually really tried to engage these guys, in tell us what you need and that's what you get sort of thing.

Participant A3: [00:19:10] Get the right tools to make yourself safe. We'll buy them if you'll use them. If they have problem, we'll fix it.

Participant A1: [00:19:16] If you have overweight vans, we'll take you off the road. You won't get it back for another 12 months.

Participant A3: [00:19:24] You won't get them back...it's been 12 years now!

Participant A1: [00:19:29] Our job is to support - when you were on the trucks. Our job is to support those guys. And I think that was a change in mindset that these guys probably struggled with more than us because we didn't have any baggage.

Participant A4: [00:19:43] I think that now we've moved on a little bit from the beginning. There's a more positive vibe about the crews, the job in general. Everybody's not so negative. You don't walk out there and everyone's head sort of slung down, walking around. People seem to be more positive and happier now I think.

Participant A5: [00:20:02] I mean, you turn up on site, you have a conversation with them and instead of kicking him in the bum you just say maybe this is an observation - You can do this better this way and just give me a few different ideas and if they take it on board, it all run smoothly.

Researcher: [00:20:14] So I guess that, from what I'm hearing, that's a relates that relational transparency coming through and actually dealing with you as a fellow human being and a colleague, rather than saying, I know that you're doing that job wrong. So, there's a level of relation, improved relations.

Participant A1: [00:20:32] Yeah. When we try very hard at the management level to have no titles. We're all just in here, we're all chipping in, we've all gotta cover each other's bums and backs and things when we need to and backfill, but we are trying to be, you know, without titles here, we're just getting done. It's almost like centres of expertise.

Participant A2: [00:20:52] So do you think self-awareness ties into a bit of 'the bosses don't know what I go through attitude'. You don't know my job and you're just a paper pusher.

Participant A1: [00:21:06] So it's more about the individual...

Researcher: [00:21:07] It's more about the leader. So, in this situation it's around - Does the leader know their strengths and weaknesses or are they running a bull at a gate without fully appreciating their own issues or areas of improvement?

Participant A2: [00:21:25] Yeah ok.

Participant A3: [00:21:25] A little left field too. I'll touch on what Richard said earlier in AVDD and we've got a constant issue I think with the client and ourselves and using his equipment which should be used. One of the most powerful, powerful meetings I ever sat in on. Was about 7 years

ago at City West Water. I think you may have been in the room. It was 120 blue collar workers and quite a few managers involved. And it was actually the brother of the Sydney Water Maintenance Worker who got killed. So, the brother got up and spoke about AVDD and the need to use it and went through his brother and actually started tearing up. And I've never, ever heard a room where you could hear a pin drop. And that message resinated with every one of those workers for three/four years. So, it'd be nice to be able to get someone along those lines that actually been through it. And they are a maintenance worker just the same as you and you. And everyone was switched on. It wasn't coming from management. It was coming from the brother of the guy that got killed. So that was a powerful message. And a bit similar to me, a few months ago, where I was involved with a trench collapse out at Essendon and one of our colleagues here, Shane Johnson, was actually hands on helping get the guy out. The guy survived, and I went to another chap down at the workshop down at the Altona Treatment Plant where the Firies that were on site on the day actually were addressing the room and letting them know first-hand what they have to deal with that. And once again, it's a more powerful message than just coming from management, so you could collate the two.

Participant A6: [00:23:11] Another good thing is I've realised the management reward good behaviour and I gives their guys more of an incentive to do better. So, like I know in the past, that like Bunnings vouchers and all that kind of stuff have been given out. Now I know it's only something small it gives something for the guys to look forward to. Even if it's just a pat on the back. Yeah. It shows them that they were doing a good job and they want to do better. That's what I've realised as well.

Researcher: [00:23:35] One of the things that I think you mentioned, Craig, was when people when they're working out the field now that they’re not slumping over, their heads are up...oh that was you Dale. If you see an improvement in safety, the leadership in the safety climate, do you think there's a correlation to how the work is done and performed, like in terms of your efficiency, how well you do your job?

Participant A4: [00:24:10] Well, I think it's more to do with - They're happier in their jobs. We went through a stage not all that long ago. Where it was fairly ordinary. Blokes were not happy at all. And I've seen an improvement and it happened fairly quickly. With the guys being happy. And I find that if you're happy, you're probably find that instead of grumbling about it, you just do it. So, things that need to be done that not everybody agrees need to be done as we've talked about before, with blokes thinking that there is no hazard there. You probably find it if their happy they're just going to go, well it takes that five minutes, let's just do it rather than stuff him I just don't want to do it. Which that's been big culture here, and for years it's been like that on and off...hasn't it.

Participant A1: [00:24:58] But that happiness is leadership creating an environment for them to be happy.

Participant A5: [00:25:06] I think we've changed the culture a little bit too over the last few years. A lot new people coming in. And a lot of them, you know, people moving on.

Participant A3: [00:25:13] Change only happens to for the people that want to change. To and for the better. So that's why quite a few have moved on. Or been moved on.

Participant A5: [00:25:23] Well that's just what happens.

Researcher: [00:25:25] And does that impact on your ability to respond and be resilient to change or issues that you're confronted with? It's the biggest, strongest is probably the wrong word. But you're able to respond better to a more challenging situation because of that as well.

Participant A5: [00:25:45] Some guys just struggle with change in general, like what I was just saying, some people can't handle, especially in this sort of industry, most blokes are just used to doing what they've done and how they've done it. And don't like the idea of change at all, whereas others are like, oh, well, as part of the job, time to move on.

Participant A3: [00:26:04] It's a good question. I've seen a lot of surveys that...Do you like change? Are you willing to change? Personally, I love it as long as your changing for the better. I love change. Whereas I think that others do struggle with the old - I called it the old coconut syndrome. They just won't change. And in the end, 90 percent of the time, they're no good for the business.

Participant A2: [00:26:28] So I guess one thing we've found is that it's got to be for the right reason and done in the right way. So, Alan and Neil would be a great example.

Participant A1: [00:26:35] Yes, yes, I think so.

Participant A2: [00:26:35] It was good motive, we've spoken about them before they're two older guys that would have just worked until the day they died, never would have asked for a hand and never would have asked to move over. So that was spotted, and they were offered up other opportunities. Just to make life easy for them, they're still contributing just as much as they were in the past.

Researcher: [00:27:00] Just in a different capacity. Just to sort of wrap up, unless there are other things that people sort of think about as we've been working through the graph and the questions. Just a couple of questions, what does safety leadership mean to you? How would someone like a Julian/Contact Manager or a Supervisor or Coordinate demonstrate safety leadership, how would that look like to you?

Participant A6: [00:27:33] Reward good behaviour. That's what I would say.

Participant A3: [00:27:38] I just always step back and never expect your workforce to be doing anything that you wouldn't be reasonably capable of doing.

Participant A2: [00:27:51] So in the past, I would have said sort of walk the walk. Pretty similar to Rob. Sort of changed my view in the last year. And it's probably more related to hearts and minds, and it's in giving people the power to make decisions. I don't need to sit there and put a procedure in place when they Dale knows the right way to do something, I'm sure he's done it a million times. Yeah, he's got to. That's the best way to do it.

Participant A4: [00:28:23] I think that's a big thing. Let me guys have their say. Rather than having it punched into you because you don't listen. It's the honest truth. They just go blank and the little birds between the headlights while you're talking.

Participant A2: [00:28:43] Exactly.

Participant A1: [00:28:46] I don't think there is such a thing as safety leadership, to be honest. I'm not going to get a Sidney Dekker on you, but I don't think there is. I think if you're if you're a decent human being and know how to get on with people and know how to influence people, then how to get them to work with you. You know, I got taught within five days of starting my career thirty-two years ago. You get things done through people. Let's see if you can do those three things. You're stuffed. And I don't think safety is any different to operations, to HR, to IT, to problem solving out in the field. I actually think we're trying to create a bucket for safety leadership and I don't think it needs to exist.

Participant A1: [00:29:46] Lisa, what do you think mate?

Participant A7: [00:29:48] Don't do that to me Richard.

Participant A1: [00:29:50] I'm sick and tired of seeing the birds flitting around. What do you reckon? Because you've been around for a while.

Participant A7: [00:29:57] Yeah, I have. I don't really know.

Researcher: [00:30:02] It could be a contrast to other places you've worked as well. I mean, I could show some good insights.

Participant A1: [00:30:07] Now safety's not just physical.

Participant A7: [00:30:19] I don't see a lot of safety issues. I'll look after the complaints and stuff. I don't see a lot of safety issues with our PFM people. That's more with the contractors. So, us, we've got it pretty down pat. That's great.

Researcher: [00:30:37] So going back to the contractors' piece, it's around finding the right contractors, that align with our values and approach?

Participant A1: [00:30:44] Very much so. Hence the contract model drives us away from that drives them away. It drives them to shortcuts.

Participant A2: [00:30:55] The complaints that you do see come through and they move you towards quality, are they? Are there safety concerns?

Participant A7: [00:31:01] Safety and quality, more quality. But even if there is a safety concern, there might be a bunch of loose stones just pulled out without any tape around it. There will be three high and just sitting on the edge of the road. If that was our guys, we would have had it all taped up and it would be all done properly. But I unfortunately with the contractors. They're like, oh well, can we get at them on Friday? And I'm asking them Monday. There's no urgency with anything.

Researcher: [00:31:35] One final question and I'll let you go and you could take some muffins or water. And I guess it relates to you sort of getting a sense that there's been some safety, organizational improvements and changes that seen some safety improvements along the way from what I've gathered. Are you sensing that there's improved quality of work improvements in how things are being done that have an impact on that as well? So as so, safety is improving, but it's also your work improving at the same time.

Participant A1: [00:32:16] It's interesting the supervisors talk about it seems to be busy, but we still just seem to be more efficient. So, everything seems to be more controlled in their mind. And they're the ones out in the field, I guess, feeling it because they're seeing things where there's things that've gone wrong or not gone wrong.

Participant A3: [00:32:36] I think on this contract we're about to go down the very interesting road with your board set up out on site. Because I find that prestarts and paperwork, and you just keep hearing, like I see it with the guys, it's just too much. You you've got a three-hour job and it's taking an hour and a half to do all your permits and safety, and this and that and they're tick and flicks. I think we're about to go down a new road to change that type of mentality as well. And I'm interested to see how that pans out. But it's been it's needed well before time.

Participant A1: [00:33:11] [Inaudible]

Researcher: [00:33:20] Any other sort of thoughts, comments that you want to share if you haven't shared or other questions I haven't asked that you wanted me to ask?

Participant A1: [00:33:33] Steve hasn't answered anything. Anything else to add Steve?

Participant A8: [00:33:33] I answered one earlier.

Participant A1: [00:33:38] Oh did you?

Participant A3: [00:33:38] With a nod.

Researcher: [00:33:46] So there's no other questions or things that you want to be the asked that you want to answer.

Participant A1: [00:33:51] No, it's not so much sort of questions is probably more statement. I think safety become less in your face here in the last twelve months. Six months. Three years. I just I'm looking at it's like we don't. You know, we don't try and splatter it around the walls anymore. It's just it's just happening.

Participant A8: [00:34:16] Well we had a period for quite a while where it was just safety leader after safety leader that would just come in.

Participant A2: [00:34:23] It was like a running joke.

Participant A8: [00:34:24] The ten years that I've been here. I've seen five or six. Different guys coming in. Just like every year. There was someone who was. And then obviously now the last few years we've had one stuck with one. And I feel like it's made a difference. A lot of the other guys complained too, that they felt like their ideas weren't listened to. Or stuff like that as well.

Participant A2: [00:34:52] So yeah, our safety committee is very similar. Thing that has started them. And for me, I started Archon 10 times and I've used them to try to reboot it. How we got to a point where it's not even necessary now, I think we've created avenues where we hear the complaints, you hear the safety concerns, and I need to bring it to the table once a month. Things sort of be addressed then and there and seen a really good turn around as well.

Researcher: [00:35:21] And I guess that back into that safety empowerment piece, management's priority and ability to respond.

Participant A1: [00:35:28] I think I think one of the things Julian did when he first came in, you guys would know about this necessarily, but he basically sat down with each of us and said, right, you're accountable for this manage it and then he'd support us and backed us to the hill for everything we wanted to do and where we were going to go off track. He gave us that guidance on maybe I wouldn't do that just yet. I would try this first. We've taken him at his word and done those things. And they've worked. So, he's empowered us to empower ourselves to go and make calls and make decisions, which we do.

Participant A2: [00:36:09] Something I've definitely picked up on and I hope increasing as well is that Julian will do things and you two steps ahead. And Julian is here to me it looked a little short sighted. And then six months down the track, you realize joint's 10 steps ahead. He always had that view. So, I feel like hopefully crews is starting to say that even in the safety aspect.

Participant A6: [00:36:31] It's all of our repetition really. You do the same things all the time. You just become second nature. It's just people being born lot like the old timers. I've been doing it for that many years. You know, in a different manner. They're not used to the safe perspective of things. So, once they get into a way of just doing it every day and safely, that will get useful eventually. It just might take longer than long.

Participant A1: [00:36:55] I remember telling the Grocon board one day they said How do you get safety right? I said we create good habits. I said, I bet you guys dry yourselves when you get out of the shower the same way every morning. And they just looked at me horrified. And I said, you're going gonna go check it tomorrow I guarantee you.

Participant A5: [00:37:18] They don't get complacent with what they do every day. Yeah, you do the same thing every day. There's never been an issue. You still would take the steps to make sure, you know, that everything is in place and that nothing can go wrong.

Participant A1: [00:37:31] I don't, I don't think we get so. what's the best word hypersensitive about safety these days. I mean, and then that comes out of having trust in these guys, knowing that they

really are the experts in what they do. Sometimes we need to refresh them to make sure that they're doing the same things that the contract, ask them to do that. Generally, I think there's a greater level of trust that these guys.

Researcher: [00:38:01] Can I can't pull that that string a little bit. Is there trust in management?

Participant A4: [00:38:08] I think there is a lot more so now than it was a few years ago.

Researcher: [00:38:13] And from you're from the workers perspective, so we get you through the big one is the what came first, your trust in management or management's trust in you?

Participant A4: [00:38:30] Management, I think first and then the guy saying that there was changes and started to accept the differences rather than fighting it all.

Participant A3: [00:38:39] So I see it two ways too Tim because I was part of it, the previous management group and I must be doing something right because I'm still here. So, I'd say the two sides I'm talking about are the guys as well. There's been a lot of guys that were not willing to conform or change that have moved. We've moved on. They haven't moved on. We've moved them on. And that makes a complete difference with people having trust in management, because that's purely the new culture coming into the place.

Participant A2: [00:39:13] Conformed is probably a tough word to use. So, I guess from our perspective, we haven't tried to make people conform as much as we conform to what they need. Yeah, that's probably from the top down. Again, it was just some tricky cases.

Participant A7: [00:39:33] There was a stage there where you'd see you know a few guys out in the kitchen. They would say to them, what have you done wrong? And then you'd be closed door and this and that. Now of course.

Participant A2: [00:39:45] It's been a long time since that's happened.

Participant A7: [00:39:47] Yeah, it's been a while.

Participant A1: [00:39:49] I think I think we realized that... I think we realized that we had to give it to get it.

Participant A4: [00:40:03] I think as Robbie said with a couple of problem cases, we have a couple of guys once they once things change and we've moved on bloke's have seen that things that have happened rather than well just these guys get away with blue murder, they've done nothing. And yet I simply get my arse kicked every other day because I do my job. I think that opinion changed them they're like, all right.

Participant A3: [00:40:24] So it's a very militant, union orientated workers, too, that would stand over other workers. That's not the case here anymore.

Researcher: [00:40:34] To close because we've just got over half an hour. I've appreciated your time.

Participant A2: [00:40:38] We're just getting started now.

Participant A1: [00:40:44] We've set it up so we've got the whole morning.

Researcher: [00:40:48] If you were to describe the culture of the workplace. So, yeah. Can you describe the culture of the workplace in one word?

Participant A4: [00:41:04] Transparent.

Participant A2: [00:41:06] I would've said Positive.

Participant A1: [00:41:09] Transparent. I would say collaborative.

Participant A1: [00:41:25] Respectful,

Participant A5: [00:41:26] I think they're more happy to work now. They come to work now. They're happy to do their job. And so, I'm having a bit of a, you know, a good laugh and a bit of a joke. It's not always militant, you know.

Participant A8: [00:41:39] Cohesive.

Participant A7: [00:41:44] Did you just say that? That just blew me away.

Researcher: [00:41:53] I think sometimes. Safety is my favourite, I really enjoy safety, but to be honest, none of this is about safety. It's about people. It's about how we do work. And just I like to view it from a safety lens and I appreciate Richard's comment that safety leadership is, I'm paraphrasing, stupid. It's not about safety leadership, it's about just being good person leader. I think that probably sums it up to a tee. Think we get safe outcomes through positive transparency, collaborative, a cohesive workforce.

Participant A1: [00:42:33] I think I think you can easily fall into a trap in a high-risk industry from actually being scared of safety. And say you do everything to effectively protect you in a court of law which you never protected against anyway. And this is now getting down to Sidney Dekker path. You only just need to understand how it works. Organizations need to be more resilient than they are.

Researcher: [00:43:04] Is there one? Is there anything that you think needs to be continue to work on? Stop being worked on or something that needs to be stopped to improve safety, to improve safety within the contract or maybe within Programmed.

Participant A5: [00:43:24] I think we need to keep encouraging our guys think outside the square and to have a bit of a shot okay this might be a better way.

Participant A1: [00:43:42] I think we need to do what we're going to do this year, which is putting a mentally healthy workplace strategy that has safety's psychological as well as psychosocial pain, that's something that organizations generally crap at understanding. Safety is physical. It's like dust. Injury and cuts and things, not job stress and that sort of stuff. I think that's important. That will take us to the next level.

Participant A2: [00:44:22] I see most of our injuries coming from fatigue. So, it's the end of the day, the last five minutes. Finding a way to keep people engaged throughout the entire day is probably a huge challenge and something that we come across last year when we did move to people line was, once we spoke until we catch out, they pretty much as pointing the finger at each other and said we knew we shouldn't have been working together. Finding that before it hits chaos would be really, really good. So, whether it's about being approachable or changing teams, finding some other system for that to work going to be really important.

Participant A6: [00:45:03] I think fatigue hits you a lot when you're doing shift work. When you go in those 10 days and you're doing, you know, from early shift and straight away change the next day to night shift, you kind of feel more drained. And when you're not in those hours.

Participant A4: [00:45:14] I never find it at the start of the shift, I always find it like the last three days, Monday, Tuesday, Wednesday, the last three days of your shift they're just.

Participant A6: [00:45:22] I found that the opposite. You got over the hump, and you're like, I'm nearly done.

Participant A4: [00:45:27] I think I found the struggle I was nearly done; can this go any slower?

Participant A6: [00:45:31] There's four days coming up, four days off coming up.

Researcher: [00:45:37] Thank you very much for your time. Thank you for allowing me to go a bit longer than the allocated time. Thank you for continuing the conversations to let that go. If you do have any questions or issues, let me know.

E.1.2 Focus Group B

Date: 12 February 2019
Location: Tullamarine, VIC
Speakers: Six (including Researcher)
Duration: 34 Minutes 39 Seconds

Researcher: [00:01:49] As you may be aware, over the last twelve months or so, there's been a couple of surveys that's gone out to the PFM around safety, leadership and safety, culture / safety climate. Before I work through the process of what does that all mean? I thought it'd be good to stand with a couple of people within the organisation. So, what do you think this means? And then that'll make much of a lot easier or possibly a lot harder. I'm not quite sure which one that will be, but that's what this is all about, really. So, I'm hoping we can get it done 30 minutes, City West Water decided to chat a little longer, which is fine. But if you have to leave, that's fine. Just go through what we can. So, the first graph that you can see here is our own demographics that have been identified by the participants in the survey this year. So, the survey was done in November 2018 from memory. So, the top left working across to the right, we've got our length of service (I didn't put a label on this, which is disappointing). Our age demographic on the top right. And the bottom row we have our gender identified, gender and identified time fraction of employment, whether we're admin or a field-based role, whether or not we have a leadership position is the yes / no. And if the tick Yes, then identified in the next graph what their leadership is or whether it's an executive manager all the way through to a coordinator or supervisor. And then the bottom right graph is identifying what workgroup they've come from.

Participant B1: [00:03:35] May I ask a question.

Researcher: [00:03:35] Yes, please.

Participant B1: [00:03:36] Is in regard to the administration / office, then you've got trades / labour field. Should it be the other way around? Should you actually have more within the trades / labour field?

Researcher: [00:03:50] Yes. So, the majority of our businesses is the more trades / labour / field based. So that's a possible thing to comment on.

Participant B2: [00:04:06] Is that what you're after? Comments on the date?

Researcher: [00:04:09] Yeah, comments on the data and then we'll get to see actual results. So, about something that stood out to me.

Participant B1: [00:04:17] So that was just an observation for me as in it's great that we have office staff aware of safety and all that. But I think it's more important that you interact with them.

Participant B2: [00:04:36] It looks quite like that you haven't joined in drawing a distinction between self-delivery trades and subcontractors. I'm assuming there are subcontractors in here.

Researcher: [00:04:49] There will be some subcontractors in here.

Participant B2: [00:04:51] So I did something that I find quite useful when we're talking about our safety culture is the fact that we don't draw that distinction and the fact that that's. That extends into something like this is quite telling. Do you think with this column here, is there? Did you want to include something that's like not any of those things?

Researcher: [00:05:23] So in terms of the leadership type.

Participant B3: [00:05:28] What were the selections?

Researcher: [00:05:29] They were the selection. Yeah. So, if someone was a team leader, they might put down supervisor.

Participant B2: [00:05:35] I just meant like, no. Yeah.

Researcher: [00:05:37] So that only popped up if I ticked Yes to the ownership role. So, it was a parent child. The other one that stood out for me is that obviously we've got more males than females. But that's consistent with our workforce in general. It would probably go up higher if we had more trades responding.

Participant B1: [00:06:07] So did people not respond to your survey?

Researcher: [00:06:10] Yeah. So, we had about a forty-five percent response rate from memory.

Participant B2: [00:06:26] That's pretty good.

Participant B1: [00:06:27] Oh yeah.

Researcher: [00:06:29] Like you say, I would have preferred more trades, but they're not always in front of a computer. Any other comments or things that I would asked on the demographics space?

Participant B3: [00:06:44] I mean, there's hardly any 18 to 20-year old's, but that seems pretty typical. The study age, basically it's not broke.

Researcher: [00:06:55] In the next two graphs you see the orange and blue vertical graphs. The first one is the 2017 survey responses based on what from each of the contracts that were identified from. I've de-identified it so you don't know that's Barwon Water or that's City West Water or VCFM. And the 2018 graph shows the same data for the November 2018 survey results. You'll notice along the bottom there are some contracts that have not come across into the 2018 dataset. So, say R from 2017, isn't in 2018 and vice versa. There are some that are in 2018 that weren't in 2017. So, for description for yourselves, the survey had two parts to it. One was around the safety climate. What do people think of the safety culture within the organization, so it's identified as the blue graph and that was rated out of four. And the orange is a measure of the authentic leadership of who is identified as their leader or manager. So, it might have been a contract manager, a functional manager or potentially could have been their coordinate or supervisor. Don't know exactly how I responded to those responses. So that's out a five. So, the thesis that I was sort of working through at the time as part of this project is that safety leadership drives culture and that drives performance. This why I picked out those two aspects.

Participant B3: [00:08:52] So the higher the authentic leadership means the... What's that's the definition of authentic?

Researcher: [00:08:58] Yeah. So, I'll get to the definition of authentic leadership. So, my thinking was I'll match these two up and see if there's any correlation between the orange and the blue columns for each of the graphs.

Participant B2: [00:09:10] And to do this good over the two years to show?

Researcher: [00:09:13] If there's been any change. So, you know, say in contract A that we've seen a decrease in the authentic leadership between 2017 and 2018. But the safety climate has remained relatively same. Is there anything that sort of stands out from that? Or you want to ask a question out of my response.

Participant B1: [00:09:57] So the data that you received in 2017, the volume of responses?

Researcher: [00:10:04] They were similar. Obviously there have been a number of contracts that have dropped off that weren't expected to participate again.

Participant B1: [00:10:14] Let's say, for instance, H whatever contract that might be, the volume responses been...,

Researcher: [00:10:26] Yeah, I can't tell based on this representation.

Participant B2: [00:10:30] I wonder if you'd get a closer correlation if you level out the scale because one of the data sets is measured out of four, one out of five. You're trying to show that there's a close relationship between the two, but the orange is always going to be hot. Well, not always, but it's likely to be higher because it's being measured out of five. That's hard to see how close the correlation is, and I know it's a lot of data to include on one charts and perhaps as a way like trust assumption for a second chart or something. But these two are good at showing the relationship between the two. The safety climate and the authentic leadership, but if you're trying to show trends like the one that you pointed out, which was interesting with the safety leadership, it decreased, but the culture had remained the same. You are very familiar with the data, so you immediately can see that sort of thing, that sort of probably without you pointing that out may not have spotted that kind of thing. And so perhaps just having a chart where maybe with a smaller dataset or something, you can align 2017 and 2018 and see them together. And then the only other comment was just that these lines you probably want to add them to the key because I'm not sure I know it's probably obvious if you're in statistics, but I don't know what they are.

Researcher: [00:12:03] So that would be average across the region. Yep, that's fair.

Participant B2: [00:12:12] And stop me if it's included somewhere else. But I think that's probably just because Bids, and we're used to like critiquing and investigating.

Researcher: [00:12:25] That's why you're here.

Participant B2: [00:12:27] But I'm kind of wondering like even though all of the data is here, I think if it's still, I was waiting for your explanation about what you wanted to show. Yeah, so, I'm just trying to think if you even if you had headings that were more like they got more explicit about this, essentially, you know, what does this data show? And if you write it in your own words and say, you know, the relationship between safety climate and an authentic leadership, or common patterns, or as I said a big change in leadership or like even if it turns into five graphs instead of two. I think if you kind of sharpen the focus a bit, it'll make it easier for someone like me who's not a statistics person.

Participant B4: [00:13:32] I'm just opening this up as a discussion, but, what would be interesting to me is to find out the demographic of the people who have the higher average authentic leadership, because I throw up the theory that as those people go through, the younger generation are probably more authentic in their safety leadership than they the ones have been in the workforce for some time to bring into history.

Researcher: [00:14:07] And that should be achievable to go through and do.

Participant B4: [00:14:13] Because I would have thought just, and I'll generalize here, but the safety climate is pretty much consistent, doesn't really matter whether the leadership is up or down. And that's a reflection of the fact that we work in an organization that is just a called a zero harm organization. But, you know, there is an influence with those leaders. But it's not the driving factor.

Participant B2: [00:14:57] Is it, would you say, it would be useful to use each of those age brackets or could you even just say anyone under 40 or over 40 or is there a tipping point?

Participant B4: [00:15:09] Yeah, I don't know. Let's just say if we said anything that had authentic leadership score of greater than four, what's the demographic of that.

Researcher: [00:15:19] Versus those under three?

Participant B1: [00:15:21] Yeah.

Participant B2: [00:15:23] I like that. Kind of picking it outliers and investigating it rather than just doing [inaudible].

Researcher: [00:15:28] Good.

Participant B1: [00:15:33] No, but it makes it makes sense because then you would see what the thinking is behind it as well.

Researcher: [00:15:45] What I will do is get you to move to, I'm conscious of time as well, you got two blue graphs (these horizontal ones). So, they are a breakdown of the safety climate, and the authentic leadership survey attributes. So, within the safety climate survey, there were seven dimensions that were being measured. Three relating to management and supervision or supervisors, and four relating to peer to peer perspectives on we as a workforce work safely. So as mentioned, that's being rated out of four. So again, you mentioned that piece around comparing fours and fives is quite difficult. So that's valuable to take on board.

Participant B2: [00:16:45] If they separate, it doesn't matter so much.

Researcher: [00:16:47] But when you're putting them side by side.

Participant B2: [00:16:48] Yeah. Just when you're doing that.

Researcher: [00:16:51] So here on the on the graph you should be able to see that from a, it's fairly tight in terms of its consistent rating between each of the key areas. But looking at this on face value, at least the management safety justice was identified as being less strong compared to other dimensions. And workers trust in the systems as well as management safety priority and ability has been identified as stronger in that sense. So just for your benefit, there's seven to eleven questions per dimension, from memory. One of those say for safety justice was, management look for root causes rather than blaming an injured worker. So that's the safety justice piece. And there mightn't be anything that stands out for people, but there's presenting that out there.

Participant B3: [00:17:58] How many people did this survey?

Researcher: [00:18:03] One hundred and fifty-four.

Participant B3: [00:18:08] Yeah.

Participant B2: [00:18:10] This is very minor, but I would just spell out dimension. I wonder if it would be clearer if a scale, if you played with the scale a little bit where you say he had a bar graph and that was sort of representative of zero into three point five and then four was over here and then you would kind of see the distinction a little bit. I don't know if that's allowed. If you're allowed to do that. The first thing I noticed was that there wasn't a huge difference, which makes me wonder. If people just sort of were thinking about the culture more generally and unless something really stood up to them, they tend to they tend to give the same response.

Researcher: [00:19:07] There are a couple that I could see that stood out and said, you know, we could blame the workers here. But then some of the other questions balance that out.

Participant B1: [00:19:17] And I guess to it's interesting as in what area that you work in. So, you know, perhaps within an office environment, you may not feel that way. Perhaps, you know, an operational environment, they would perhaps feel that way.

Researcher: [00:19:35] So perhaps breaking this down by labour or office.

Participant B1: [00:19:39] Yeah. Is that what you were going to say?

Participant B5: [00:19:43] I was going to say was going to say that.

Participant B2: [00:19:49] Great minds think alike.

Participant B1: [00:19:51] That was Adele...

Participant B2: [00:20:00] And I know it's pretty obvious, but what were you trying to... I kind of know what you're trying to show in your own words. Are you trying to show?

Researcher: [00:20:09] So whether or not if we have a more authentic approach to leading safety, does that have an impact on the safety perceptions of the workforce and then a measure in safety or organizational performance data underneath it as well.

Participant B2: [00:20:30] So with some of these dimensions they aligned with these dimensions or not really.

Researcher: [00:20:36] They are different instruments. But I'm gonna see if there are any correlation between the two. So, there's four dimensions of an authentic leader. One's around self-awareness, whether or not they have a balanced processing of information. Whether they are relational and transparent in those relationships and whether or not they have by an internal moral compass or internal perspective. So, to have a set of values that they work to.

Participant B2: [00:21:12] So I think if you're if you've gone to the trouble of measuring different elements of leadership and different elements of climate, if there's an opportunity to align those two, it would be interesting to see whether the same things that affect leadership perception affect climate. And also, if one of your objectives, like you say, was to kind of save the relationship again, then I'm kind of... I know it would be tricky, but perhaps if you simplified and aligned these simplified enough to where you could kind of overlay these two things again. And just this is minor, that if you've got leadership in orange in this one, make that orange as well. Because I'm a colour person.

Participant B1: [00:21:59] Or PFM green.

Participant B4: [00:22:25] So just there's so little divergence in the survey, right? I think this does nothing for you to do other than to declare that a leadership drops so does safety culture. Is that what you're thinking at the moment or do you think to it? Because I would have thought if there was any sort of, well, I mean, these are so close. Can't know.

Researcher: [00:22:52] And maybe we're not focused on particular contracts where there are differences, marked differences, that might show clearly. Yeah.

Participant B2: [00:23:04] I wonder if you included, like left this as it was, too. And how many questions I mentioned roughly. So, I'd say there are 10. Oh, say they're five, right?

Researcher: [00:23:15] Yeah. That one, maybe three to four.

Participant B2: [00:23:17] Like if one sort of does this one had to do this and then the last one does this. Even if the average is this I think this becomes interesting but only if there is discrepancies in you know you've categorized all of those things have self-awareness. But it's only interesting if there is a good discrepancy between.

Researcher: [00:23:45] Within the same question. Any other comments on any of those two grounds?

Participant B5: [00:23:56] I would like to add to please. You know how all contracts are different? So, wouldn't be safe to put in the differences between, say, City West Water and, say, Orica, because their safety rules might be completely different to City West Water's and or say just for instance, Housing or Gatton prison.

Researcher: [00:24:20] So breaking up the industry types?

Participant B5: [00:24:22] Yeah. Because they all have different safety concerns. Plus, not just safety is on, you know, your body. it's in your mind as well. A lot of things obviously happen on contracts and it can affect a person on a mental state, which is very important to everybody to have.

Participant B3: [00:24:50] Yeah, there is a difference even though Programmed is trying to us as a whole be uniform.

Participant B5: [00:24:57] Yeah, then some contracts need a bit extra I think.

Participant B1: [00:25:02] Because of what they were actually working with. Yeah. On a daily basis. Yeah. And where they work.

Participant B2: [00:25:08] Do you mean like if it's really high risk where we're not high risk.

Participant B5: [00:25:12] Yeah, well I mean I think about like the prisons, people that work in the prisons. They see some things that you know, and they were in that all the time. And that can affect you.

Participant B2: [00:25:25] Yeah. They talk about complacency with prison being a problem. Yeah.

Participant B5: [00:25:29] That even the housing contracts mean. Yeah. Some of the things you see might affect you mentally or whatever. And that's more the trades guys. Obviously maybe the administration as well. That's why I think it might be good if we split this between contracts as well. Those trades and office. Yeah.

Researcher: [00:25:49] There's a significant statistic that mental health nurses become mental health patients in hospitals.

Participant B1: [00:26:00] Yeah.

Participant B2: [00:26:02] Adele reminded me too that there's a difference between the contracts in terms of how much influence the client seems to have. I'm not guessing that's not something you've really focused on in when he captured the data, but it's probably something that's coming out in the data anyway, like are we, you know, while we have our own safety system, sometimes the kind of very heavy handed in the way it does. Yeah.

Participant B1: [00:26:30] Or the other way or the other way when they get away with a they don't have that same safety culture as what we do.

Participant B3: [00:26:37] Yeah.

Participant B1: [00:26:38] So when someone's working on that side all the time, they also become a little bit more complacent.

Researcher: [00:26:47] A couple of follow up questions and then I'll ask the final question. For yourselves what the safety we should bring to you?

Participant B4: [00:27:01] Consistent messaging.

Researcher: [00:27:05] Sorry I should have said Health Safety Environment.

Participant B1: [00:27:20] Leading by example. I also like the fact that at Programmed, it's if you see it, then you own in it. You don't walk away from.

Participant B2: [00:27:46] I heard a little anecdote about Chris Sutherland recently. I hope he doesn't mind me. I'm sure, he does that because somebody else shared it with me. But where a worker was injured in a high-risk activity. It was on an alliance and the client side of the alliance wanted this person to be removed from the contract because they thought that they'd done the wrong thing and that it was just big enough for them to not be not come back to the contract. And Chris Sutherland, and the natural inclination at that point is if the is telling you want this person off the contract, they're not like a senior person just get them off the contract. But Chris Sutherland stood up and said, you know what? That's not really how we behave. Sure, you did the wrong thing. But that's on us. We need to make sure that he has the right training and that everyone is. Is that the learnings from that are shared across the organization. Yeah, and so they did. They kept him in. He was, used as an example is kind of the wrong phrase, but Chris kind of made sure that he wasn't blamed in that instance and that. So, it's probably a no blame thing, I suppose. But, you know, sharing learnings and not natural instinct is not to blame the person. They did something that was outside of the procedure that they were familiar with. But, you know, no one does that sort of thing because they feel like taking a risk. They did it because it was something else going on that they felt they needed to do that for us.

Participant B1: [00:29:42] Did you get all of that?

Participant B2: [00:29:46] No blame culture and sharing learnings.

Researcher: [00:29:52] I guess that revolves around the values as well.

Participant B2: [00:29:58] Yeah, I think it's protect. It's protecting the people, you know, like not just rules for the sake of rules. It's like if the rules are failing, then let's think about what the rules are.

Participant B1: [00:30:09] I think that also. Okay, you've seen that through from Chris Sutherland. So, it flows down. Yeah. So, because of his leadership and what his beliefs are, that flows through all of us. Well, that's my general feeling. I mean, I've worked in another organization where it was, you know, that common thread where someone was going to be hurt on the site or lose part of a finger. And that was an accepted practice. It's not an accepted practice in our own organization. So, we look at ways to, OK, this has happened. How are we going to change that practice and train those people, you know, on the contract to ensure it doesn't happen?

Researcher: [00:31:06] Final question is there anything that I didn't ask that you wanted to answer? Or are there any questions that stand out for you?

Participant B3: [00:31:15] So for the authentic, or either actually, are they all weighted equally? I suppose, just you can make the argument that dimension two...

Researcher: [00:31:26] Go around relational transparency?

Participant B3: [00:31:30] Yeah, I think you could say that it's more objective. It's something that your team and your clients would see more. So, you could say that it affects safety more. Well, you know, I'm just thinking maybe it's it could be weighted more than the other dimensions. But you can say that other things. And what's the, was the survey selections. One, two, three, four. So, it wasn't like 'somewhat'?

Researcher: [00:32:05] So if they were. So that was a five-point and a four-point Likert scale... So, there was the wording as well as you had number. Only the authentic leadership one had a neutral / sometimes.

Participant B2: [00:32:32] That's kind of a good point though. Maybe it'd be useful to include those on the actual graph. So, you get more context to what does a four or five actually mean.

Participant B5: [00:32:42] Yeah.

Participant B2: [00:32:45] Even if it's a key down the bottom. I was going to say a similar thing about the self-awareness, relationship transparency. I assume that you go into detail about the definitions of those elsewhere. But if someone who sits in isolation, maybe just a couple of key terms underneath.

Researcher: [00:33:02] Excellent. Thank you for your time.

E.1.3 Focus Group C

Date: 18 February 2019
Location: Melbourne, VIC
Speakers: Five (including Researcher)
Duration: 32 Minutes 40 Seconds

Researcher: [00:00:06] As I mentioned, I'm working through this process of unpacking the data and in doing so, without drawing my own conclusions, first off, I want to share some of my thoughts with get your thoughts on some of the data itself. So, the first graphs you should see on the page will provide some of the demographic data across the survey results. This is for the November 2018 survey. Along the two along the top is our ages and years of service effectively. So, you probably notice a spike in the blue for the years of service. I'm assuming that might be a number of people from the APAM contract doing the survey. And on the bottom row of the graphs, we've got male, female, their role types of his full time / part time. If it's trades or field based vs. office / admin, whether they've identified as a supervisor of people, if they have than the one next to that describes their supervisory role. And then the final graph shows the contracts where people have come from. So, there's probably four or five key contracts that come through and then support offices, probably the other are the one that comes through there as well.

Participant C1: [00:01:38] Nobody from WorkSafe.

Researcher: [00:01:39] No one from the WorkSafe contract. It's sort of consolidated into another one, so I'll delete that. So yeah, WorkSafe comes under the Orica contract itself. There might not be any information that comes out of that, but is there anything that still stands out as a bit of a sore thumb, or anything like that?

Participant C2: [00:02:02] No, I think it's good that you get a lot of that, the 40s to 50s, the people who have the experience. Because you can't beat experience at the end of the day.

Researcher: [00:02:14] Excellent. And I think looking at the gender balance in the business as well, I think that looks consistent with what our general makeup is. That probably would be more disparity if we had more, say, field operations to the survey. So, what I'll do, I'll just think it through the next page if you think of things along the way you can always come back to it. So, the next two graphs sort of represent the 2017 and 2018 survey data. I've matched up each of the contracts based on alphabetical system. So, if contract in 2017 did the survey, that letter will carry across into the 2018 data. And if they were new, there also would be a new letter in 2018 set. If they've dropped off, then it won't carry through. So, the blue section of the graph represents the safety climate survey aspect. And within the survey that was done, there's also a section on leadership styles. So that's the measure of authentic leadership, which was picked out from my literature review and that's represented at the orange graph. So, I put a line on both of those around the average across the region for both authentic leadership and safety climate within the organizations. So, I wanted to share that with you.

Participant C1: [00:03:58] There's been an increase, which is good.

Researcher: [00:04:01] It looks like there's an increase. Yes. In the safety climate. Is there anything that looking at that, that you go; this looks different compared to the previous year or within this particular context, how that might be.

Participant C3: [00:04:22] There's a bit of a jump on the H column with the authentic leadership. Do you go back and try and trace the reasoning for that?

Researcher: [00:04:30] Yeah. So, what I can do is I can look at the contract itself. I've sort of deidentified it, so you can't look at City West Water. And also, to say, well let's not focus on the people, let's focus on the systems around that. So yes, H has a jump.

Participant C3: [00:04:49] So you go back in and track it back to the cause of that.

Researcher: [00:04:53] Yeah. Well we'll see if there's any correlation.

Participant C1: [00:04:57] There has been declined in the couple to. Especially M whatever that contract was.

Researcher: [00:05:16] Would you say there is any relationship looking at that (very face value) between the two measures?

Participant C3: [00:05:26] On face value? No, not really. Yeah. It seems to not follow any real pattern. The majority, the average of the authentic leadership is always higher than that of the safety climate. Unless people find it easier to analyse and recognize leadership than they do the climate of safety.

Researcher: [00:06:01] Looking at the data. If there's a decrease in authentic leadership, does that impact anything from what you can sort of see?

Participant C3: [00:06:14] Oh yeah, it seems that, like for the M example, both of them went down.

Participant C2: [00:06:21] Both of them dropped at the same time. Even I's had a big jump in the authentic leadership. We knew they were well below the average. But then they've had a big jump and got up. So, whether or not there was something that was picked out there that they've really worked on, but they really lifted because they were well below everybody else that did well to get up on the average.

Researcher: [00:07:28] And the blue graphs gone up?

Participant C2: [00:07:31] They were a lot closer to the average than what they were.

Researcher: [00:07:43] So I guess what I'm hoping to see, is that if we improve our authentic leadership, then it may have some impact on safety culture or the culture within the workplace as well. So, we'll see what happens when I drill down into that a bit further. What I'll also then do - like I said, come back to this if you think about it as well - the next two graphs break down the safety climate survey and also the authentic leadership survey into the different dimensions of what that means. So, the safety climate survey carries across seven dimensions, seven elements effectively. Three of those focus on perceptions of their manager or supervisor, management, and then four focus on peer-to-peer perceptions. So, does my colleague work safely? Does my colleague take risks? Or does my manager have capability to lead safety effectively? So that's in the first blue graph there, page. And it looks like their fairly similar in terms of their rankings, so their all ranked out of four. I don't know if that is statistically significant yet, but management commitment and priority or ability and priority is obviously a bit stronger than many others. And so was workers safety commitment. So, it seems that most people think that there's a commitment to safety in the organization, both at management and an employee level. It appears that management, safety, justice returns a smaller result. So, there's an example of one of those questions in the online survey was when investigating an incident my manager looks for the root cause rather than blaming an individual. That's one of the examples or questions there. Is there anything that's consistent with your experience within Programmed over the last seven months around any of these aspects? Looks like Management Safety Justice, is quite a bit lower, is lower than the rest. Open for discussion.

Participant C4: [00:10:21] I think that's something very common on a lot of sites. On this site, I would say it's pretty. You guys probably want to correct me if I'm wrong, but I say it's very one of the first sites where it's really been the opposite. No one wants to point the finger at anybody after an incident. I think it's more about trying to make sure that we improve the systems and improve the processes, remove the hazards, whatever it requires, no expense spared sort of thing right to the top

I think Chris leads by example there, and I think it's the total opposite in this site. But in general, I think that's a very common piece of feedback that you would get.

Researcher: [00:11:09] So what? And maybe related back to previous workplaces you've come from as well. Is there anything that makes it more just within the workplace or if it is unjust, then you can specify that as well.

Participant C1: [00:11:27] Coming from where I've come from, what comes from a construction background. There was a certain element of the public - that the public was sort of always locked out of your workplace. So where here the public is also very much the number one thing that you take into, you know, you have to take into appraisal of what you're going to do, like working outside of new roads or whatever, or if we're in the terminal if something does happen, how it would affect the public. And it's a lot of times will be hang it's the straight up first thing to do or it's too busy to do this now. So, and we have the flexibility to go (luckily) to say that we can schedule these works tonight or you guys schedule them, you know, at a quieter time or organize it properly. So, I think that's always works in our favour here.

Participant C4: [00:12:17] We can't take the shortcut.

Participant C1: [00:12:18] No.

Participant C4: [00:12:19] We found out by not only our client, but also the passengers, they've all got iPhones and they'll take photos, they'll show someone working unsafe or too loudly or unprotected.

Participant C1: [00:12:30] So I do. We do. I believe we see other trades, especially the trades inside that are working in the construction part, sort of doing stuff that I don't think that we would. Yeah, I don't know whether it's because we're sort of working, they are working directly for the airport, but they've signed a contract saying that they sort of only work those hours. So, whether or not they get more flexibility, whereas we have to 24/7. You know, I can push the airport, so we can just say, yep, we realize that it's a problem. But it's easier for us to do it tonight at one o'clock in the morning. And then it takes away it takes away a lot of any sort of dangers or stuff like that.

Researcher: [00:13:10] So do you think that maybe from a worker's perspective, there is an increased level of trust in the system? That then works as well.

Participant C3: [00:13:20] Yeah.

Researcher: [00:13:20] Because you've got that not 'flexibility' but the empowerment to the workers to make that call and say, actually, no, let's stop that.

Participant C1: [00:13:35] We can use that. You know, there's no sort of pressure on us to rush off and do things. Because a moment, hang on we're going to impact operations here or if something was to go wrong, somebody might get hurt. And that's the end of the day was what you what you did to take away all the risk. So that's just an avenue that's open to us. And it's something most of the blokes know, a lot of officers don't like you're working when there's people in there as well. And so, you say to them we want to fix now because we're here and there won't be anybody here tonight. We can work around that.

Participant C4: [00:14:07] I think on this contract, the two main pressures that you always get when you take shortcuts in safety is time and money. So as Richo said, we work around the clock. So, time is not an issue. The only pressure we get there is from the actual client - person that has requested it. And when you think about money, same thing - we have a lump sum management contract. These guys are covered whether they do it today or tomorrow, whether they sit around today or don't sit around, and I can get a hundred jobs, or ten jobs done. Doesn't matter. We don't charge any more charge any less. So those pressures are off their shoulders and now they can actually look at the job properly and approach it properly in terms of safety

Researcher: [00:14:40] Good.

Participant C1: [00:14:43] And there's sets of eyes everywhere.

Participant C4: [00:14:46] That's almost like they're the police officers aren't they. You can't do something dodgy because you got management watching you got the client watching, and you've got the public watching.

Researcher: [00:14:57] And it's all recorded.

Participant C4: [00:14:58] And it's recorded, yeah. So, you really can't.

Researcher: [00:15:06] Looking at the fifth element there as well. Worker's safety priority and risk non-acceptance. That seems to be a little bit lower than other peer ones as well. Do you think that there's a level of risk in everything that people do, or risk is just a part of our jobs?

Participant C2: [00:15:29] There is some risk in most, well, a lot of it is just negotiate around it to try to minimize it as best you can.

Researcher: [00:15:39] I think one of the questions is, you know, risk is unavoidable. Risks are unavoidable. One of the questions was similar to that. And I guess that you approach that, and it's about how you approach it, determines whether it's safe or not.

Participant C1: [00:15:54] That kinda comes with experience too. You can't beat experience. I know working in construction, having young blokes, you always as an older bloke if you see a younger bloke maybe gonna to do something, stop him because I'd much rather hear that you stopped him and said, check what you're doing instead of walking past in hear that he cut himself with a saw later on. And you didn't say nothing then you'd feel terrible. So, experience becomes a lot to do you know how to minimise it.

Participant C4: [00:16:18] It's a pretty open question too, like when you look at zero harm and you know you have KPI's around having injuries or you want zero harm. I think that's an ideal world and you and you preach that, and everyone tries to support that. But things happen. And I think when you ask a question about risk, is avoidable or is it...Is risk part of everything?

Researcher: [00:16:41] Non-acceptance of risk.

Participant C4: [00:16:43] I think, you know, in a perfect world, you sort of answer it saying I think we can manage risk properly and try and eliminate the nearly fully. But again, there's real world where you just have to manage the risk.

Participant C1: [00:16:54] It comes down to 'accidents' at the end of the day. Most of the time it would be an accident. It wouldn't be somebody taking a risk. If you're going to write zero harm on tops and shirts, you have to own it at the end of the day.

Participant C4: [00:17:05] Agreed. Yeah. I'm not saying we don't support it. I'm saying it's a great way to push. But again, there are risks.

Participant C1: [00:17:13] And that's where you go to accidents. So, you get zero road toll.

Participant C4: [00:17:18] Exactly right. I imagine there may be more, but I'd say that to think they're going to get to zero as well as the commercial said, you know, which we who we happy to get rid of. You know, no one of course you can.

Researcher: [00:17:30] That's good. What I will then look at is that second blue graph it's around the authentic leadership piece. So, the authentic leadership based on some of the literature focuses on

four key elements. Self-awareness, relational transparency (that's fairly self-explanatory), internalized moral perspective so let's put that in an actual concept, a good way of saying, do we operate with a set of values or are we true to our values effectively, and then balanced processing. So, do we as a leader look for all the information and then make a decision based on the information. Rather than just making a decision then saying that's why we're doing it. So that's the four sorts of pieces there so looking at that relational transparency seems relatively higher than everything else. So, we've got good relations.

Participant C4: [00:18:33] They're all higher than these.

Researcher: [00:18:35] Yeah, they've got different measures; this measures at a five, this is out of four. Looking at those four sorts of things. Do you think there's any aspects of authentic leadership that may contribute to safety or how safety is managed or led in the workplace more than another?

Participant C1: [00:19:11] For me, working in a shift group with three blokes, you're sort of responsible for those three blokes. You know, we're all sort of responsible for each other because you don't want to be... I always ask blokes where they're going. What are they up to so if they are off and they did go to do something by themselves then we couldn't get hold of them, you'd be like it's a big airport they could be anywhere, you know, oh, hang on, I heard he was going down here. Because you could be looking for hours and not find somebody. So, I always try to sort of keep track of where everybody is. And if they don't have to go, if they don't have to go and do a job, even if it's just simple plumbing job or something, you get into the day, we just don't know what happened, so I always try to hang on, I'll come along and tag along, just to always have been in group. And like, I'll always tell Joel, you know, if you're going to do something, give us a call, let us know. To say when there's three of you, you sort of doubled up doing something? Yeah. Just in case.

Researcher: [00:20:11] So a higher level of teamwork and cooperation.

Participant C1: [00:20:16] And I think that way it's more counterproductive too, we get more done. If we can organize ourselves, some blokes have certain times when you can get into certain areas. So, where if we're all working together, as we all know, we've got a job to do and we all need to get stuff done. It just helps in your awareness and, you know, work and safe as well.

Participant C4: [00:20:36] An example of that is the low voltage emergency rescues everyone's getting trained on. All the shift guys we ran through that. It's mandatory for the electricians, but the electrician are the ones that need rescuing so were going to run everyone through it. Make sure that their available for their buddy I guess.

Researcher: [00:20:59] Is that a decision was made based off feedback and I guess that conversation.

Participant C4: [00:21:05] To be honest, I don't know. I think it popped up as, this is this is a training that's required. And then from that, it was ok, why isn't everyone doing it? Think about it rationally. The natural question is ok we have to train the electricians, everyone else is putting their hands up saying if an electrician goes down, what do I do?

Participant C2: [00:21:24] There are a lot of us mix with electricians when we work anyway. You know.

[00:21:28] [Inaudible]

Participant C4: [00:21:32] They're at risk working by themselves aren't they.

Participant C2: [00:21:32] Yeah, that's it.

Researcher: [00:21:42] Are there any attributes of a leader or safety leadership that you think promotes an improvement in safety within the workplace or culture within the workplace?

Participant C3: [00:21:52] I think they really, truly have to believe in it. Yeah, it's the kind of thing that moves well from the top down. If it's continuous. So, we always discuss it in the toolbox meetings, it's the first topic it's always a topic. We're required to do our safety talks. So, if you instil it as part of your day to day and you can see your manager leading that...then it really does flow down.

Participant C2: [00:22:22] Yeah, that's what I was gonna say. If they're leading by example. You know, others will follow.

Participant C4: [00:22:26] And as long as it doesn't look like a chore for them. Like they actually believe it.

Researcher: [00:22:31] That wouldn't happen across the business would it?

Participant C4: [00:22:32] No, no, no. It's great to have these targets for safety conversations. And even within the trade group, there's some that actively want to get as many done as they do. And there are always ongoing having safety conversations, reporting hazards. And then there's others that are going ok this a target KPI that I need to meet. So, I need to do it. And that's the difference.

Participant C1: [00:22:54] So I think guys, too. We don't realize that we just are having a conversation about how jobs going to be done is actually a safety conversation. Yeah. And I pointed it out to Rino the other day when we need to like Jerry, hang on, that conversation is going to register as a safety conversation. So, put in Noggin.

Participant C2: [00:23:15] You do, really, we do it every day.

Participant C1: [00:23:17] You do it without even knowing it.

Participant C2: [00:23:19] It's just a matter of recording it.

Participant C1: [00:23:19] You are doing it and going along, but you're not thinking of I've gotta have my phone out and start recording all this. What do you think about doing your job? Are you doing this or doing that? It becomes second nature.

Participant C2: [00:23:32] One of the guys onsite asked what is a safety conversation? I said, well, you know, before when you ask me about it...I said, that's a safety conversation about...I'm unsure about this, how should I do it? I said that's the safety conversation. If you're unsure and you asking the question. You're asking how to do it to make sure you don't get injured or you're going to do the job right.

Researcher: [00:23:52] I think, I said I'd try to get this done in about half an hour or so. I'm sort of thinking in broadest terms. Do you think that safety leadership has any impact on the performance of the business?

Participant C4: [00:24:14] I think yes. When I look at Dave and Chris, looking at the top for this site.

Researcher: [00:24:20] Yeah, they are not here so we can talk about them.

Participant C4: [00:24:20] They really do instil safety. They lead by example. I think from that safety aside, is that professionalism that comes with that. It feels like a well-oiled sort of machine.

Participant C1: [00:24:34] A confidence.

Participant C2: [00:24:34] In your management.

Participant C4: [00:24:35] And it's a well-oiled machine. And, you know, they're on their game. They're not just, 'Here's the job. Let's get there by one o'clock. we bloody get it done and relax. That's what it's more about, just the jobs we're doing where there was a bigger piece here. We want

to enjoy - with the safety talks we have we then follow that with celebrating something and having a cake and those sorts of things. And there all little things. But it's you know, it's just adds to that's a well-oiled machine that looks very professional, I think. And it gets that buy-in for everyone else going, OK, this isn't just a regular site. This is this is something more.

Participant C2: [00:25:09] It helps create just a confidence. You guys being confident in us, us being confident in management and knowing that we need your raise something you don't have to sort of whisper about it all. Mate just come straight out and say it if you do see it. Yeah. And create a sort of harmonious workplace where nobody's management or we are management and workers. But there's a there's no big divide. Everybody's respected if we come to them and say something.

Researcher: [00:25:36] Like a level of trust between workers and management.

Participant C2: [00:25:40] Yeah.

Participant C4: [00:25:41] And then I think that flows onto the clients, so what we were talking about before. We can't do any wrong firstly, but the guys have got the...it's built in with them that they have to do it properly. They've got the buy in. And from that the feedback we're getting from the majority the time is positive with positive feedback, you know, more things positive grow from that. When it becomes negative, it gets worse negatively.

Participant C2: [00:26:05] So you get runs on the board at the end of the day. You are showing that these guys have got this far, created no issues had no lost time injuries or stuff like that. So, they're creating a background these guys are actually doing what they're saying.

Participant C4: [00:26:20] We've got them out there in the monthly meeting in the moment. And what the first hour and a half meeting in the first half hour of that's going through the safety. So, you know, they're showing the runs on the board, setting up that meeting to show how professional we are, and we're on our game and we've got the guy's buy in. And to the clients sitting and listening before we even talk about the job we've done. It's already very, very positive sort of space.

Researcher: [00:26:45] Does workers trust of management come before or after management's trust to the workers?

Participant C2: [00:26:59] I'll say after.

Researcher: [00:27:01] So workers after managements trust.

Participant C2: [00:27:04] Yes.

Participant C4: [00:27:04] Guaranteed. I don't even think that's a hard one to answer. Do you think?

Participant C1: [00:27:09] Yeah, I think it's after.

Participant C2: [00:27:12] Yeah, yeah.

Participant C1: [00:27:15] I'm going to speak of what is always coming from a construction background where management have always pushed, there's always been a push. So, you always have that sort of a divide and the management like to Darth Vader sort of personality sort there, whereas that's that doesn't sort of. But partially it's also a different, there's not always a completion date that sort of looming in the background, making you think, 'Oh shit, do we need to get this done. Can't afford to hold up stuff like that so.'

Participant C4: [00:27:52] I think there is a power in numbers. There is very few on the leadership, sorry, Management Team and there's a big crew of trades. So, they feel comfortable together. And when that when one person starts to go in a certain direction, then naturally you do in a group, you know, do I want to follow him, or do I not want to. So, I think at first there's no trust. And then, you

know, management need to give that trust to the trades. And then you slowly start you. Yeah. You sort of with him on board, I guess. I don't think they keep it up straight away. But then I don't think management do either. So, you have to actively make that mental decision to say, you know, I'm not going to trust these boys.

Researcher: [00:28:31] And I think we've touched on a couple things like including truly believing in and living safety. How else can our leaders or do our leaders here Programmed demonstrate their safety leadership? You've talked to a couple already, are there any others that pop up?

Participant C3: [00:28:52] I think it's always. It's um...like with Gwen, you involve Gwen at the start. It's always thought or a consideration when you're starting something, whether it's a project with Adam or, another new piece of work. It's always best I think you get your OHS guys on at the start as opposed to the end when they're doing a walk through and it's like 'Nah'.

Researcher: [00:29:25] And anyone can be involved in that process, or make that engagement when it's not...

Participant C3: [00:29:28] I think it's good...When I started, I wasn't expecting to have an OHS rep on contract. But having someone on contract is it's a great set up, just having a face, someone in that seat to ask questions.

Participant C4: [00:29:51] Nat always says, you don't want to work in the contract you want to work on the contract. I think that's part...even Chris and Dave were saying it to us at the FM level, I guess. And I think it's very hard to do at times. And I think a lot of times thinking about the broader aspect of safety is working on the contract. Not necessarily in the contract. Yeah, day to day on the jobs, like doing a JSA for each job or take 5 for each job, that's a requirement. But actually, looking at the bigger picture and getting the buy in and rolling out safety committees and those sorts of things. It's working on the contract and I think that's pretty important to do. And having a safety rep on site makes us do that, I guess. Leads that. That's her job, so it definitely helps.

Researcher: [00:30:41] Is there anything else that sort of popped up looking at the pictures, sorry the graphs or through the conversation? Is there any questions that I haven't asked that you wanted me to ask so you can answer them?

Participant C4: [00:30:58] I think it was pretty thorough.

Researcher: [00:30:58] Well, thank you for your time.

Key Informant Transcripts
E.2.1 Interviewee 1

Date: 26 February 2019
Location: Tullamarine, VIC
Speakers: Two (including Researcher)
Duration: 16 Minutes 24 Seconds

Researcher: [00:00:03] So thank you for chatting today. First off, I wanted to ask if you could quickly describe your role in, at Programmed. And how long you been doing that type of work in general?

Interviewee 1: [00:00:16] Yes, so, I am a commercial manager at the Melbourne Airport contract. I've been here for now eight months. So, my role is basically looking after the finances of this contract, plus making sure that we obviously follow our contractual obligation - maximize our profits. Yes. So, prior to that, I was at City West Water as an analyst. Sorry, it was a lot of the reporting seeing trends saying this is areas we need to focus on these, you know we had KPI so making sure we're adhering to KPIs. And then prior to that, I was at Barwon Water for a year as commercial manager there.

Researcher: [00:01:00] Wonderful, thank you. And how would you describe safety leadership here at this contract at Melbourne Airport,

Interviewee 1: [00:01:12] I think it's leading by example. So that's how I see it. I've got to admit safety culture is pretty good on this site. We have a workforce who are really engaged and who do point out when something is not quite right, they don't just walk past it. So, from that respect, we're really lucky that from management perspective, it's not sort of reinforcing safety every day. It's already in the mindset of our staff. It's just making sure that we also follow that example.

Researcher: [00:01:43] And how do you think, so you've said around leading by example. Are there any other ways that you think safety leadership, that you've observed safety leadership being demonstrated within Programmed or within this contract?

Interviewee 1: [00:02:02] I think it's just it's one of those things that just gets brought up every day. I think without even realizing. So, we'll be talking about something and we may forget to log the chat, but it is there is some aspect of safety of saying, well, have you thought about these or have you looked at that? So, I think that is in the forefront of a lot of people's minds and especially in the type of work we're doing. It's not just I look after the finance and the administration staff, but you obviously have trades staff come in and they'll have a conversation about the work they're receiving, and you can hear the types of questions that are being asked. So...

Researcher: [00:02:38] So it's about having the confidence and the ability just to have a conversation and pose questions or encourage people to think a bit more laterally. as opposed to quite narrow in their task.

Interviewee 1: [00:02:52] I think the good thing about I guess the management team is they'll listen to the guys. If they've got an actual safety concern, it's never been even when I was at City West Water, if a job is unsafe, you stop work. It's you know, we won't compromise on safety, if you believe that a task is not right.

Researcher: [00:03:12] How would you describe the term safety culture? But what does that mean for you?

Interviewee 1: [00:03:22] I think a safety culture is... um...

Researcher: [00:03:29] How would that look in this contract? Obviously, you've said an engaged workforce...

Interviewee 1: [00:03:34] I think it is just an engaged workforce, who think about task prior to doing it. So, they may not realize that, I know we drill this whole Safety is number one, or this and that, but I think a lot of the time it's common sense too. And a lot of people tend to think about things prior to starting so that they make sure that they're not going to hurt themselves.

Researcher: [00:04:04] How do you think that safety leadership impacts on the performance of the contract? Or does it impact on the performance of the contract?

Interviewee 1: [00:04:16] I think it does, because if you've got a leadership team who aren't thinking about safety or who aren't leading by example, it flows down to your workforce. If we take shortcuts, they're going to take shortcuts. And I think it's also a care factor, too. We are taking shortcuts then I think, well, maybe they don't care about my safety and well-being.

Researcher: [00:04:45] And do you think that then has a flow on to customer satisfaction, employee engagement or financial performance?

Interviewee 1: [00:04:53] 100 percent. LTIs cost the business a lot of money. Even workers comp and all of that. Any injury is going to cost the company money? So, it's gonna be sick leave, it's gonna be workers comp, whatever the situation may be, it will cost you money. So, a safe work force is actually more cost effective than people who are continually getting injured. It does definitely impact client perception because if they can see that we're doing things well and we're doing it safely, they're going to want to up their game. People always remember the bad things before they mentioned the good. So, if they say that all these guys are always, you know, jaywalking or they're always doing this. That's always gonna be in their mind that that's what our company is known for. As bad as it sounds, they everyone remembers the bad before they remember the good.

Researcher: [00:05:49] Obviously that the financial impact would be so much more visible to you than others within the business.

Interviewee 1: [00:05:55] 100 percent, I think. Look, I don't know how much it costs in dollar figures, I guess it depends on the extent of the injury. But yes.

Researcher: [00:06:06] So as part of the unpacking the data out of these recent surveys that finished in November 2018, you have to worry about that. So, I've been working through the some of the comments within the survey with some free text comments at the end and had some workshops with a few staff from the Airport, City West Water and Collins Street unpacking that data as well. And there are few words or phrases that that came out in those conversations, as well as the data that I want to share with you. And I want to get your thoughts on if anything resonates with you or if you disagree or agree with anything or want to build on. I've listed them alphabetically, just for my convenience. Caring, collaborative, connection, cooperation, empowerment, learning. No blame, personable, respectful, rewarding good behaviour, takes action, teamwork, transparent, trust, and walk the talk. So those are some of the words or phrases that come out in reflection on I think safety leadership within the survey. Are there any in there that you would resonate with or agree with or disagree with?

Interviewee 1: [00:07:33] I tend to agree with most of them. I think the no blame ones, definitely a good one. People tend to be scared when they think that they're going to be in trouble for doing something maybe incorrectly. So, I think it's important for people to know that, yes, they make mistakes. That's okay. They just need to admit it and work out a solution and fix it.

Researcher: [00:07:55] I think you use the term like a care factor, earlier as well as this has a bit of a connection there. Thinking about how this contract leads safety or could be how you other people within the management team do safety leadership in, do they demonstrate aspects of those of those terms?

Interviewee 1: [00:08:28] Yes, definitely. I think the care factor is really high on this contract. We definitely care about the staff working here. They want everyone to go to their families.

Researcher: [00:08:42] And thinking around the last 12 months. Did you participate in or facilitate any of the following three? And they've got some questions if you did the Authentic Safety Leadership Workshop that I may have facilitated. After-Action Reviews or Learning Teams?

Interviewee 1: [00:09:00] I think I did the safety leadership workshops.

Researcher: [00:09:04] That would have been around mid-year

Interviewee 1: [00:09:05] Yes, we did that at the airport.

Researcher: [00:09:09] So if you got a couple of questions on that. So, thinking around the Authentic Safety Leadership Workshop and obviously I understand time's past, so you might not remember everything out of that. Was there anything that stood out or resonated with you from that workshop? That was a good idea or. No, I disagree with that at all. There might have been anything. And again, time has passed.

Interviewee 1: [00:09:38] I honestly can't remember. The only thing I remember is you showed a TED talk. Yeah, I remember that one. I know there was a workbook.

Researcher: [00:09:51] I guess one of the key premises of that was focusing on a model of authentic safety leadership and I guess posing a question that does authenticity have an impact in how we lead safety well. Has that sort of been... Is there any views on whether or not authenticity has some part to play in and how we lead safety in the organization? From your perspective.

Interviewee 1: [00:10:28] I think you need to be authentic with all things to do. Sort of how we're supposed to... for me, I don't I believe someone if they're not being authentic or if I think I've got ulterior motives. So yeah, I do think it has an important part to play.

Researcher: [00:10:48] And thinking about how this contract is wrong or led. Are there any ways that you or other parts of the leadership team demonstrate authenticity with their colleagues? Or is this just a way of working?

Interviewee 1: [00:11:06] I think it's a way of working. I definitely think the operations team and Chris are very authentic. Obviously, different ways of going around. Everyone's got different personality types. But I think it's just dumb. Something that just comes naturally.

Researcher: [00:11:23] So how do they demonstrate... How would you how do you observe that coming across being authentic?

Interviewee 1: [00:11:29] Well, for me... I'll use them as examples.

Researcher: [00:11:33] Yes, it's hard to be yourself.

Interviewee 1: [00:11:35] Yes. I just find they really people focused. So, they'll ask if they're teams, what's wrong. And they'll always try and say, well, something from their perspective. And then they'll say, look, you know, I understand that this is the way we need to go about it. And I think they don't just say, no, you have to do this. You have to do that. It's very it's sort of a genuine type conversation, I feel, when they're speaking to a lot of the staff. It's different. I guess, you know, the demeanour is quite calm and, you know, they've got that empathy so good. I guess, you know, just by speaking them, they're...

Researcher: [00:12:12] A different breed of people?

Interviewee 1: [00:12:14] Yes.

Researcher: [00:12:17] Okay. And so obviously that then has an impact on how. I don't want to call them the followers. Workers in the team then respond to that isn't there?

Interviewee 1: [00:12:29] Definitely.

Researcher: [00:12:32] Part of the Safety Leadership Workshop proposed there's four dimensions of authenticity. One's around self-awareness, relational transparency. So how transparent we are in our relationship with people. Whether or not we have or were guided by an internalized moral perspective or moral compass. So, a value system or value set, and a sense of balanced processing. I'm getting a sense from the conversation already that relationships are important factor in how safety is led here at the airport. Are there any other things that you think might be required out of those four of the all equally important in how we lead safety or.

Interviewee 1: [00:13:29] I definitely wouldn't choose one or the other. I think they all have... I guess it's a balancing act. You need a bit of everything don't you.

Researcher: [00:13:45] And then the final question that I wanted to ask before we sort of finish up was looking at there were three, I guess, key challenges coming out of the workshop, encouraging all participants, both here at the airport and elsewhere across the region to focus on building psychological safety, demonstrating vulnerability and sharing stories as a way of building the safety culture within the workplace. Have any of any of that sort of filtered out into the into the workplace that you're aware of or observed? And is any of that really important and how we lead safety or build a culture?

Interviewee 1: [00:14:33] I know that I have heard stories that provided examples and said things about what's happened in other workplaces. I think stories that are easier for people to stay tuned also. It's not just spitting out a whole bunch of facts and numbers. It's actual. This happened in real life. I think it just makes a situation easier to relate to.

Researcher: [00:15:05] I'm thinking around some of the things you've said around people - stopping work and just posing questions or asking questions at the right time. That's obviously a reflection on the psychological safety within the workplace. They feel like it's safe for them to speak up?

Interviewee 1: [00:15:23] Yeah, definitely. So, I know with City West Water that was really big. They used to say that if you feel a worksite is not a safe, then you need to speak up to stop what you're doing, and it can be investigated. So, I dare say they'd be the same here, though. I haven't heard of anyone doing not any of our actual staff yet doing anything when they cut corners. They haven't brought up a situation. If anything, they bring up every situation.

Researcher: [00:16:01] So that's the I guess, the key questions I want to ask, but the final question I've got is, are there any questions that I haven't asked that you wanted to explore? It's a bit of a curveball question at the end.

Interviewee 1: [00:16:17] No, I think it's been pretty good.

Researcher: [00:16:20] Excellent. Perfect. Thank you for your time.

E.2.2 Interviewee 2

Date: 26 February 2019
Location: Brooklyn, VIC
Speakers: Two (including Researcher)
Duration: 21 Minutes 48 Seconds

Researcher: [00:00:02] So to start off with, thank you for your time. What I would like you to do briefly to start off with sort of scoffed me, your role at Programmed. And how long you've been doing this type of work? Or that type of work either here a Programmed or elsewhere.

Interviewee 2: [00:00:18] So being with Programmed for close to two years now and worked in the water industry for the last 18 years, managing operational and maintenance, I guess worksites. But also, more broadly getting involved in more strategy alignment with safety teams and in commercial teams and in operational teams to bring the three teams together to get the right outcome.

Researcher: [00:00:53] And that's both here at City West Water and I guess strategically looking at other water opportunities across PFM.

Interviewee 2: [00:00:59] Yes. So, across PFM we have the communities of practice. And we we're looking more broadly across what's our water industry offering and CoP [Community of Practice] brings that alignment together from a strategy perspective. And then we start marketing Programmed in the water industry with the Sydney Water and other authorities across Melbourne.

Researcher: [00:01:22] And as I also described, this research process have been looking at safety leadership and its impact on organisational performance. How would you describe safety leadership at this contract at City West Water?

Interviewee 2: [00:01:37] So I think if I reflect previously when I first came into the contract, I thought safety leadership was poorly managed, you know, and it was... And that was basically from the leadership team on the contract down to our boots on the ground. I think over the last two years, we've invested a lot of time and energy around working out what our strategy is on the contract. And we developed five themes of improvement. And one of those themes were safety. And then safety had a number of initiatives that we've been driving on the contract from embedding Noggin, to making sure our leadership team are being visible out on onsite, really pushing the PPE process out to our subcontractors, doing safety audits. And we've seen a big improvement with our LTI frequency and MTI frequency rate dropped down dramatically. But it's really for me it was about boots on the ground and being visible out onsite.

Researcher: [00:02:38] Excellent. So, I guess that's one way of how safety leadership has been demonstrated at this contract - are being visible, which is I think really, really valuable from a worker perspective. Is there any difference to how safety leadership's been demonstrated across PFM from a VIC / TAS perspective? Or is it similar from your perspective?

Interviewee 2: [00:03:02] I think it's quite similar. I think one thing that that I like every month is that we have a, in our contract managers meeting, we have a safety pause at the start where we can learn off each other, what other contract are doing. But I also think it's important. I think we've got the right focus. When the regional manager, yourself Tim, provides an overview on safety and provides information around how we've performed over the month, but also year to date. So, we track on the number of safety conversations, we track the number of audits that we've done across the business. And we're also a contract across VIC and TAS that are learning of each other. And I think that's important. I think the good things at the airport are doing our bring into this contract and the things that we're doing on this contract we take into contracts in Tasmania. So, I think we're a we're a learning team. And I think we transfer the skills across nicely.

Researcher: [00:03:55] Wonderful. There's a term called safety cultural, or safety cultural / safety climate that sort of sometimes used in different organisations. From your perspective, what does safety cultural mean to you?

Interviewee 2: [00:04:11] I think safety culture for me is, I guess, at a high level, it's about alignment and making sure that where we're setting a direction for the contract, for the business. I think once that filters down into small parts, I think the culture that comes out of it is about the people on the ground being able to speak up and actually stop a job. And I think it's the leadership team that encourages its workforce to be a safety leader out in the field. I think once, I think for me, if I reflect twelve months ago to where I am now, I get a number of people coming into the office to talk to me about safety issues out in the field and telling me that they've had to stop a job, or they've had to do things differently to manage that. So, I think that's culture for me. Once people start speaking up and actually flagging safety issues, I sort of feel where we're heading down the right path. That's good culture for me. From a leadership perspective.

Researcher: [00:05:14] Would you have said that culture would have been there 12 to 24 months ago?

Interviewee 2: [00:05:21] My reflection on this contract, I don't believe so. I think... I think that the leadership team across program as a whole is has very refocused its safety direction. That's from Graeme down. And I think Programmed, although we have a safety manager on the contract, I think we have a good set up with a regional focus across the contract as well. I do think, though, that there is potentially that there could be a disconnect between what the contract is doing to what our safety group or leadership team is doing, I think it's I think it's good that yourself team your part of the Victorian and Tas team, even though you're reporting to someone else in the business, I think you bring that connection in from the safety group to a contract level.

Researcher: [00:06:13] Yeah, excellent. Thank you. Do you think that safety leadership has an impact on that culture piece? I think most alluded to it a couple times already. Is there any particular or tangible ways of how that's sort of connected? If it is connected at all?

Interviewee 2: [00:06:31] Say that again?

Researcher: [00:06:32] So is there a connection between safety leadership and safety culture?

Interviewee 2: [00:06:38] Yeah. Certainly. Certainly. So, I definitely link that all the time. You can you can talk about safety leadership all you want, but it's the culture that drives the outcome. I think having the right people in the right mindset, following the right processes and making them feel valued or empowered to make change, I think that's safety. And having the right culture drives that leadership on the ground.

Researcher: [00:07:04] And does that then drive any organisational performance changes?

Interviewee 2: [00:07:09] Yeah, I think so. I think if you look at the safety culture on this contract, I think we've been able to demonstrate, I guess... I think driving culture on this contract has helped the business drive a different organisational outcome. When you when you talk about safety, and I think if you look at our statistics on this contract and probably more broadly across Vic and Tas, I think it helps us when other contracts because we have the right safety focus on the ground.

Researcher: [00:07:45] Do you think there's other impacts that that has on customer satisfaction or employee engagement or financial performance?

Interviewee 2: [00:07:53] Yeah, I think. I think industries are very focused on safety. If I look at City West Water, whenever they look at a contractor, the first thing they think about is safety. I think if you can demonstrate a good safety culture and a good, and you're providing good safety, I guess statistics or performance out in the field... although there's a commercial aspect in each contract, the other 50 percent is a safety focus. So, every industry City West Water as a client, you know,

there's a reputational risk for them if we don't get safety right on the ground. Say they're very focused on safety.

Researcher: [00:08:35] As part of the review in the survey data over the last couple of months since the survey closed in November 2018, I've had some I guess some sense-making workshops with a few key informants across the business. Some at City West Water. Some in Collins Street and some at the airport. Just to sort of get a sense of what they see in the data. And also, I've looked at some of the free text feedback that was in the survey as well. So, let's just share a couple of words or phrases with you and get if there were anything that resonated out of those. If you want to share or discuss those in a bit more detail. So, I've put them alphabetically so it's easier for me to read through. So, caring, collaborative, connection. Cooperation, empowerment, learning. No blame, personable, respectful, rewarding good behaviour, take action, teamwork, transparent, trust, and walk the talk. So, this was I guess some of the key words were coming out of the survey data that I got a sense that demonstrated good leadership within the organisation where people felt that they were being led well. Are there anything, any of those sort of stood out for you as a...?

Interviewee 2: [00:10:06] So look, no, not really. I think... Is that for just the City West Water contract? Or is that across PFM?

Researcher: [00:10:14] Across PFM.

Interviewee 2: [00:10:16] So not really. I think Programmed as a business drives safety well. But I think it also filters down at a contract level. I know that I'm supported from the Programmed business when it comes to safety. Sorry, I can have open, frank conversations with the right people within the business to get a different outcome. And I always see that those, they're actioned, whether it's safety or commercial. But I also feel empowered as a leader at Programmed to make influence change as well, or make change, positive change. So, you know, setting a direction and then filtering that down to the next level. And again, and again, I think it really stems at the top. And I think if the leadership has the right culture and the right focus, then it will filter down to its workforce. So, I don't I think those words are positive. And I think that's it's probably people are in the right mindset. I think mentally in the right mindset.

Researcher: [00:11:18] I guess the. Because everything that's happening from a leadership perspective, they feel like us that there's a level of support and trust within the workforce that the leadership is doing the right thing.

Interviewee 2: [00:11:30] Yeah, yeah, yeah. Certainly. And I think that stems from Glenn all the way down.

Researcher: [00:11:36] I'm thinking over the last 12 months. Were you involved in any of the following activities, although being a participant of or facilitating authentic safety leadership workshop After-Action Reviews or learning team discussions? I think you were involved in the workshop.

Interviewee 2: [00:12:01] I think I was involved in the workshop. What was the second?

Researcher: [00:12:04] After-Action Reviews.

Interviewee 2: [00:12:08] I think I was involved in that with the team, Not the third one. Yep. Our safety manager was part of that.

Researcher: [00:12:15] So I'll just sort of focus on the Authentic Safety Leadership Workshop piece. There's a couple of questions there and then that's pretty much it from my sort of perspective. Thinking around that Authentic Safety Leadership workshop, there's been a couple of months now noted almost 12 months now. It sort of proposed a model of authentic leadership around safety. And from your perspective, how does a model authenticity adjust your views on how safety is laid? Or is there no change at all?

Interviewee 2: [00:12:51] No, I think there's been change. I think the workshop that we had. I mean, you walk away from any workshop with another bit of information to process. And I think yeah, I think my, my shifting probably has changed a little bit around that workshop. And I think the workshop helped me put together our strategy for next twelve months as well. So, I learned from that workshop about, yeah, authenticity that I can bring into this contract.

Researcher: [00:13:24] That's a similar question to how you've described before. But how do you demonstrate your safety leadership at the contract level?

Interviewee 2: [00:13:33] So for real, really, that's for me. It's walking the talk and it's actually getting out on the ground with our workforce. But I'm a true believer that if somebody comes to me with a safety issue or concern, we action that immediately goes. I want to demonstrate to the contract that we are listening. We are listening to our workforce. The contract leadership team put together our safety commitments... Twelve months ago, and we're still driving that every day and they're on our Safety Noticeboard. I like our safety data up today as well, so I'm really big with Richard to make sure that all the information that comes through is always up to date, so people can see that we are focused on safety. So, it's really for me, it's about being visible, being out there and being amongst what's happening on the ground.

Researcher: [00:14:25] And you may not recall, but the dimensions of authentic leadership would propose as being around self-reflection, relational transparency internal moral perspective, or having a moral internal compass of values, and balanced processing. Do any of those have any impact on how safety leadership should led?

Interviewee 2: [00:14:51] Yeah, the whole four. So, I just wrote a paper for City West Water and around safety and our performance on the contract. And I do definitely believe it's boots on the ground but is building relationships. It's actually having an understanding how people operate on the ground. Everyone's different. Everyone has a purpose. If people get things wrong, that's okay. That we learn by that. I'm not one that... For on this contract, we do something wrong, we get it better. I don't fundamentally don't believe abating people gets the right outcome. It is about working with someone to improve their processes, getting the best outcome next time. So, I don't believe any fault is an individual unless it's plainly clear that the individuals done something dramatically wrong. But I definitely believe that most of our safety issues that contribute to process breakdown and then we always go back to the process and understand where did we get it wrong.

Researcher: [00:15:46] And the last question or around this particular topic is around that workshop sort of encourages us to focus on three particular things. One was around psychological safety, vulnerability and then sharing stories. Any of those important and how we lead safety and build a culture on contracts or within the business?

Interviewee 2: [00:16:11] Yeah, definitely. So, the three so sharing stories is one thing that we do in the contract all the time. That's actually even that City West Water. City West Water even share our Programmed stories to their workforce. So, I think Programmed is identified as a leader to City West Water when it comes to safety. All of our YouTube clips and you know, I promote that material to City West Water that they share internally. With the safety alerts that come through, I share that. When you look at other contractors that City West Water, use their contractors don't like sharing their safety material. But I think Programmed's very open, transparent. I'm happy to share that with City West Water. I'm happy for them to share those safety alerts or stories to the broader business for learnings. So, yeah, I definitely think that yeah, we do that well on contract.

Researcher: [00:17:11] Let's talk about after-action reviews, and I know we do lots of pre-job, job safety environment analysis and pre-job risk assessments. I guess that after-action review piece is around stopping say after we've had something go wrong go or go right, we review things in that process to learn from what we've done well, or we could improve. Are there any examples or times that's been done on this contract? And what are the, I guess, the outcomes of those sort of reviews?

Interviewee 2: [00:17:46] So I think any incidents that come up, we immediately do an ICAM investigation for learnings. An example was a third-party fatality on the Ring Road. So, I actually wanted to review our processes to understand what actually happened out on site. Although it wasn't related to us, I want to learn from that. So, we brought that back into the contract. And we've learned from that and put a number of things in place. Good stories of crews doing the right thing out in the field. I think we demonstrate that we, I guess, we don't formally sit down and fill out a spreadsheet, but we talk around the table at leadership team around what potentially occurred out on site and how can we learn from that. So good stories could be, the new permit to work system that we're actually going to introduce shortly where each work site will have a board set up. So, when somebody goes to the site, they can actually look at the board and make sure the checks and balances are in place. Now that come from an opportunity to improve a system out on site. But it was a learning that we took away from an inspection that we brought back into Brooklyn to say, well, how can we make it easy for our crews? So that's probably an example of a good news story. That good that came out of an inspection.

Researcher: [00:19:08] And one that comes to mind that I've been made aware of is around the confined space entry and retrieval as well. Would that be a similar sort of review process?

Interviewee 2: [00:19:18] So yeah, that's probably a good example to cross my mind. But yeah. Confined Space entry is high risk on the contract. We set up a Diploma in Safety for some key people on the contract to do. As part of that, they set up a project team to look at any high-risk improvement opportunities, confined spaces is high risk and the contract. So, over a four-month period, they worked as a team to look at an opportunity to improve something. And they've got to come up with a project plan to change the way we retrieve somebody out of a hole using a tripod as opposed to using some sort of automatic device to reduce the risk out on site.

Researcher: [00:20:02] Excellent. Thank you for that. Those are all the key questions that I had written down and prepared. Are there any questions that I haven't asked that you would like to explore? Focusing on that authentic safety leadership piece and things over the last 12 months?

Interviewee 2: [00:20:20] I think Programmed... We do safety well. I think we, we invest a lot of energy in time and safety. I think we're at the top of the hill now where I sort of think what's next when it comes to safety? I mean, I'd like to move down to a mentally healthy workplace, and Programmed as a business, invest energy into that. I think we have a lot of processes and systems in place to get it right. And I think culturally in some contracts and not all where we're doing safety well. But for me, it's about it's that people element next. So how can we support our people more around their personal wellbeing on the contract? And I think it'd be good for Programmed as a business to invest energy into that. So, I'm sure they are...

Researcher: [00:21:14] As the next step.

Interviewee 2: [00:21:16] We're at the next step. I am a true believer that if people are in the right mindset, they'll do safety well, and it comes back to that culture piece. I think where we're good with culture, it's about what are the what are the burning challenges that Programmed isn't aware of that could cause a safety issue out in the field. And that could be family issues outside of work or whatever. So, investing energy or time into that mentally healthy workplaces, I think would be, would be good.

Researcher: [00:21:42] Perfect. Thanks for your time, Julian.

Interviewee 2: [00:21:46] Thanks Tim.

E.2.3 Interviewee 3

Date: 26 February 2019
Location: Mitcham, VIC
Speakers: Two (including Researcher)
Duration: 17 Minutes 45 Seconds

Researcher: [00:00:01] To start off with, can I get you to describe for me your role at Programmed, and how long you've been doing this type of work for.

Interviewee 3: [00:00:11] My role, a Programmed currently is facilities coordinator, although to be honest, I probably do work higher than that level. Which is good because if you invest my own skill set it's beneficial, it keeps a job more lively. I've been in Programmed ten years, five years with facility management.

Researcher: [00:00:35] And how long you been doing facility type work for?

Interviewee 3: [00:00:38] Actually I'm over 50 years old. And I've been involved in facilities over 20, almost 25 years in UK working for a hotel group as maintenance manager.

Researcher: [00:00:49] And how would you describe the safety leadership within this contract and also within, say, PFM VIC/TAS.

Interviewee 3: [00:00:59] My answers going to be double edged. A double-edged sword. I believe we do a good job and I believe that there's huge opportunities. So, we do a good job. But again, there's huge opportunities.

Researcher: [00:01:18] For you, what does it mean to be a safety leader in the business?

Interviewee 3: [00:01:23] It's very easy to go for the cliché answer. Go home safely. But which is that the joy? But again, safety is at the forefront. But a long time ago, one of our leaders Programmed did say safety is a first amongst equals. I'm very conscious. Yes, we have to be safe. But in the context, you have to be safe and get the job done. Cause if you don't get the job done, you don't have a contract. And harshly safety becomes irrelevant because you're not there to be safe.

Researcher: [00:01:57] And how do you, how have you seen safety leadership being demonstrated, at Programmed?

Interviewee 3: [00:02:05] We, my colleagues, we do walk the talk. And I think sometimes, I use my words carefully, I think sometimes, our objectives aren't always easily achievable. I think in the following questions, I can clarify that.

Researcher: [00:02:27] There's sometimes a term safety culture that gets used a little bit as well. What does that mean to you?

Interviewee 3: [00:02:40] It again is a fundamental question it's just behaving in a safe manner and sharing that safe behaviour. A very simple answer to what could be a huge question.

Researcher: [00:02:54] And how would you describe the safety culture within PFM and more broadly?

Interviewee 3: [00:03:01] We do a good job.

Researcher: [00:03:02] Because you've been involved in a couple of different contracts over 10 years.

Interviewee 3: [00:03:05] Oh yeah. And I especially here this contract where we have another SHEQ team. So, we're having scrutinized from both sides. Which is a good thing. And it gives the drive to improve. But on the same token as I say. The double-edged sword, I think that's again opportunities where we can improve.

Researcher: [00:03:36] And from your perspective, I guess experience and observations over that 10 years at Programmed in various roles. Do you think that safety leadership has an impact on the culture of a contract and the culture of the business?

Interviewee 3: [00:03:54] Very much so. In. Again, if you don't have that attitude, the contract won't be there because by default clients expect and require that high level of safety leadership attitude. And yes, I have seen it years ago at Programmed when I first arrived here it was I'm a bit more loose and even back then, one or two people took ownership of safety and made some dramatic improvements and made it very, I won't say simple, but made the process simple and achievable. Because when you come to audits, that is often where we fall over, because different people, different groups have different style and expectations.

Researcher: [00:04:41] And does that then play into customer satisfaction and employee engagement and financial performance? Do you think?

Interviewee 3: [00:04:51] Absolutely. Grant customer satisfaction. There is an anticipation and the customer isn't satisfied with safety. That is the prerequisite they're dissatisfied if there's an issue regarding safety. So, the satisfaction is as it is, the prerequisite is a standard. And failure is complete dissatisfaction. Perhaps I'm playing with words a little, but their satisfaction is the given. Go to McDonald's. You buy burger. Expect a burger. You don't expect roadkill.

Researcher: [00:05:31] As part of the safety survey, there were some opportunities for some free text responses that were coming through and through the, a couple of those sense-making workshops that ahead of the last few weeks with 17 other stakeholders across the business, a few key themes or words came out. So, want to share those with you, in alphabetical order, and sort of get your thoughts on if any of them resonate or you agree with or disagree with. If you wanted to add or build on any of those. This is around just describing the safety leadership, safety culture of the business.

Researcher: [00:06:13] Caring. Collaborative. Connection. Cooperation. Empowerment. Learning. No Blame. Personable. Respectful. Rewarding Good Behaviour. Takes Action. Teamwork. Transparent. Trust. Walk the Talk.

Researcher: [00:06:36] You've already said Walk the Talk of other areas in there that would resonate with you.

Interviewee 3: [00:06:42] I think some of those words was are critical if some a little bit almost cliché.

Researcher: [00:06:50] So which ones that you said would be critical?

Interviewee 3: [00:06:52] If you go through the list again.

Interviewee 3: [00:07:01] Caring that's empathy which is a given.

Interviewee 3: [00:07:06] Collaborative. I think we can improve that because so many different stakeholders, for example, that you guys were SHEQ, external auditors, external auditors, depending who they are, can be not ruthless, but very, very particular, almost with a yes and almost negative because it gets the point is so unachievable, you think almost a point, which is a very, very negative.

Interviewee 3: [00:07:34] Connection, cooperation, empowerment, learning, no blame. Connection, cooperation empowerment are givens. Learning, huge opportunities. No blame. It's a good position

to be in. But ultimately, even if there is no blame, people will feel blame by default. personable goes back to that. A generic group. Respectful is critical. I think to achieve that. Reward good behaviour, it's good to reward good behaviour. But in the same token, you don't want it to appear to be sycophantic and often with rewarding good behaviour. It sounds cynical. The reward for good behaviour isn't always for the person receiving the award. Often, it's for the person giving the award. And with that context it's how great am I to empower the person to do a good job? So, it can be self-serving. Takes action, that is number one. 'Cause it irritates me when you have ideas and workshops, and nothing happens. You've got to take action and have it and move forward. I do push that personally and especially in our contract here in different aspects. Teamwork, again, [a] given. transparent almost goes back to the no blame. You have to be transparent and clear. Trust. Again, it's a given without trust the whole system falls apart. What the document mentioned and then.

Researcher: [00:09:12] I guess you can't you can't learn if you're not taking action and then listening to people along the way.

Interviewee 3: [00:09:16] We've all been involved in these workshops and ideas. And it just falls apart. When I was in the UK to digress a little. We had swimming pools. You had 11 swimming pools and hotels. And they weren't they were right in there. And the whole system was wrong. They put me on a course, I had actually got the qualifications in it as swimming pool engineer or something. And the guy in charge of companies to get it done. Give me it was no budget good can be compliant. And within a few months we were the only hotel group in United Kingdom that was fully compliant in swimming pools in all aspects. Because it was funded and done properly. That's taking action.

Researcher: [00:09:56] If you don't take action, then?

Interviewee 3: [00:09:58] The whole thing falls apart, it's hopeless.

Researcher: [00:10:00] Over the last 12 months or so, actually before I get into that you mentioned, there are some areas of opportunity around how we can improve safety in the business. I guess that sector leadership piece are there are a couple of key areas.

Interviewee 3: [00:10:21] I think, yes, there's huge opportunity because we had one audit here two, three years ago and it was brutal. And a guy was drilling down, drilling down, drilling down and we'd dome in, we do the JSA/ SWMS, all the documentation we can think of. And he's going through it and he was getting failures where to go down to the level he was after. It was very specific training, specific knowledge. And it's probably the knowledge where you are in court. When you're being drilled by a solicitor and to the extent was almost disheartening because it felt like after the audit, no matter what you did, if something did go drastically wrong and you were in court, it was futile, so whatever you did, it couldn't do well enough by the letter of the law. I think it's good intent to do it well. Which we are. Would be great. And I think realistically, what this guy wanted, at that the audit or what not, what necessarily, what he wanted, what he picked up and picked out. We could never get that far on a morning of inducting and doing a JSA with a person coming in to do work. What I think, to contextualize that, we almost want a system. And I think almost there in some respects, and it could be using the tools we have in a different way. For example, your Noggin safety audits, you have a safety audit can be turned around a little bit and almost become the format. I know we do pre-starts. But pre-start discussion becomes a pre-start audit. But not necessarily an audit but a pre-start method to capture what we're doing. And of course, JSA/SWMS. Is it easy. The quality of JSA I receive, some are superb and to the other extent of having a blank form printed off from the WorkSafe site as my JSA. And there's a naive, naive belief that that will be acceptable. Clearly, that's a blank form and the person has put any effort into it. And so, capture JSA, MSDS and licences. Where this guy caught me up on always on crane movement and rigging. And he's gonna of this crane driver can do tower crane, mobile crane and he goes. But by the way, you haven't got a license for using a high-up on a truck. But clearly the guy is more than competent to operate a crane on a truck. This is like a toy compared to a crane because on his high-risk licence. He can't do that. And on who tied the load on and how? It was the guy from the air-conditioning company. He had great experience from tying on loads of air conditioning units. And he actually he made sure the straps were around the loose panels and he goes was well that's very good. But he's not qualified. The guy

he was qualified was watching not doing it now. And he goes, so if that accidentally came off and fell from the air, you're not complaining. So that was how he was drilling down. It was safe. Had feedback from the client. Thank you very much. Job well done. But the auditor wasn't happy. Yes. Going back to what I'm saying is it was a very simple workflow. Which you have already, but adjusted to be almost the permit to work, that everything you can think of is drilled down and captured. And again, it's gotta be doable, not exhaustive, but not punitive because if it is punitive. Nobody's interested in doing it, not. It then becomes self-defeating. So, I think it's a huge opportunity. And with, that also becomes, it would be great to have an industry standard of what we expect. What YVW SHEQ expect and what these external auditors expect? Because what I don't like, and I'll use my words carefully here very carefully is coming retrospectively and try to convince auditors that we're great. And when we're not, where we can improve. That may be a bit harsh.

Researcher: [00:14:25] A common measuring stick effectively?

Interviewee 3: [00:14:29] A benchmark. And the benches aren't at different heights in different places. I think what you need to get there, just a process and a process doesn't need to be hard. Could you have a Yarra Valley Water process, it becomes which I don't like, almost not flippant, but becomes very quick and casual. And we should be capturing it better.

Researcher: [00:14:51] The way you describe the auditor from a couple of years ago, that style obviously doesn't seem to work because it doesn't meet those collaborative sort of approaches does it.

Interviewee 3: [00:15:03] He was very kind of chap. Excellent. Very important. Mark St James, I think his name was. Very, very clever, very smart guy. I think he was doing his job, but it was so too hard to achieve what he wanted. So whatever process we have needs be achievable, doable and legal as well. If that is what they want, then you have to have more time to think.

Researcher: [00:15:30] Over the last 12 months, have you been involved in any of the following sort of activities that have been run as part of the project? An authentic safety leadership workshop that was facilitated by me?

Interviewee 3: [00:15:44] No.

Researcher: [00:15:44] I don't think so. Any After-Action Reviews.

Interviewee 3: [00:15:48] No.

Researcher: [00:15:48] Or learning teams?

Interviewee 3: [00:15:49] No.

Researcher: [00:15:50] So I guess one of the pieces around like some prestart activities and jobs and JSEAs and SWMS. We plan the job well. Do you ever sit down and review jobs at the completion?

Interviewee 3: [00:16:05] Oh, in honesty, only if something goes wrong and there's a huge chance for improvement. And yes, we do sometimes in that context. Yeah. Is it captured? Occasionally on a on a tool box meeting, but not captured as a formal document.

Researcher: [00:16:21] Would you see any value in doing mini reviews or debriefs after big tasks or big projects like that.

Interviewee 3: [00:16:33] Absolutely. If it's part of a process. Going back to what I said two paragraphs ago, the process in place is a job and there's a review that it. Tick, tick, tick. Great, great, great. Not quite right then. And then QR are being addressed back in learnings.

Researcher: [00:16:49] You close the loop, but that's as you set out to be. Like you said, form part of that process and say, well, if there's a process that will get done and driven.

Interviewee 3: [00:16:57] Yeah. I think now see, this is an exciting opportunity. So, I think with. Like I said earlier with Noggin, we're almost there. And you could just put another section in and it could be not tick and flick. But have you done this? Yes, yes, yes. Here's the documentation with it. I don't like the idea of and continue uploading takes too long. Yeah, but again, there's an approach of having the documents together and there are some to think about how to do it.

Researcher: [00:17:25] Are there any are there any questions that I haven't asked that you would like to explore with, I guess the context of where we're going?

Interviewee 3: [00:17:35] I think I've probably vented already. Or explained on the way through.

Researcher: [00:17:40] Perfect. Thanks for your time.

E.2.4 Interviewee 4

Date: 26 February 2019
Location: Kilsyth, VIC
Speakers: Two (including Researcher)
Duration: 15 Minutes 52 Seconds

Researcher: [00:00:03] Chris, thanks for your time. As we get started, I can't get you to quickly describe for me your role here at Programmed.

Interviewee 4: [00:00:12] No worries. So, I am Contract Manager of Kirkbrae. So obviously looking after all the maintenance for the aged care facility, which involves every aspect.

Researcher: [00:00:23] Excellent. And how long you been doing this sort of work for?

Interviewee 4: [00:00:27] 18 months. In two weeks.

Researcher: [00:00:32] And that's that at Programmed and have you got other trade's qualifications and experience?

Interviewee 4: [00:00:36] Yeah, I'm a licensed plumber.

Researcher: [00:00:41] And how would you describe safety leadership within the Vic Minor Contract portfolio as well as maybe PFM?

Researcher: [00:00:52] Yeah, very good. I've found the safety leadership being really good from the top down. Even hearing the way, Nat, Paul and yourself talk about it. So, I find it's very well managed and also very well received.

Researcher: [00:01:11] What for you personally, what does it mean to be a safety leader in the business?

Interviewee 4: [00:01:16] It's something I'm passionate about due to the fact I had a workplace injury myself, major injury about 15 years ago. So, which changed my whole perspective of how important it was when you're in an emergency ward of the Alfred Hospital with its family in tears, realizing it could have gone a lot worse. So obviously it's important everyone gets home - goes home safe.

Researcher: [00:01:41] Probably something you would want to have to wish on anyone. But yes, some of the learnings and I guess the motivation that comes out, that's pretty important. How do you see safety leadership being demonstrated within Programmed?

Interviewee 4: [00:01:57] With the communication, obviously, all the time and with comms [communication] coming from toolbox talks, obviously. Even in direct, Paul, obviously regularly making sure all the Noggin entries are done correctly. We had our own obviously KPI even from back in Brad's days to Paul's days. But that's also that was from my upper management. But I've had my own, where I'll go one step higher, which is three hazards per week. And it's always been in our weekly report. And to go with those obviously safety conversations and audits. So that's why our numbers are higher, because I've made sure we've always tried to keep to that we have successfully.

Researcher: [00:02:45] And has that resulted in improved safety performance? Do you think, on the contract?

Interviewee 4: [00:02:52] Yeah, definitely. To the extent where even the CEO here, Mark, has actually called me Mr. Safety at times, because I think...

Researcher: [00:03:01] I hope that's a good thing.

Interviewee 4: [00:03:02] It's definitely a good thing. Even to an extent where we've kept the cleaners on their toes because they have one of the ones that don't tend to be as safe as they could be. Their manager's since moved on, but possibly part of the reason they've highlighted their non-safetyness. But yeah, we're obviously working in an aged care environment, it's very important for safety, even more so when you are fragile, vulnerable people around. So that's one thing that we've always tried to keep an eye on. And we've even jumped into roles that aren't ours by helping clean water up and stuff to basically make everyone safe.

Researcher: [00:03:40] Sometimes organisations use the term safety culture. For you, what does the term safety culture mean?

Interviewee 4: [00:03:51] Well, having the right safety conscious, I suppose, but having the right attitude towards safety. So, keep an eye out at all times and basically making sure everyone's safe. From contractors, residents all the way through the managers.

Researcher: [00:04:09] And compared to maybe other organisations that you've worked for or maybe contractors that work for us, how do you describe PFM's safety culture?

Interviewee 4: [00:04:20] A hundred and fifty percent better. Especially working on a site that's got so many different contractors and working directly in management for previous companies. Working for a lot of small companies, the owners are obviously more concerned about money and dollars where PFM's always been about safety before money, which is the way I'd like to be as well.

Researcher: [00:04:46] Do you think that safety leadership impacts on the overall performance of a contract or with a business group?

Interviewee 4: [00:04:56] Yeah, it does. Well, we've always obviously I know that PFM basically sold part of the contract as we'd put safety culture that we brought in here, and we've made sure that was delivered too. I know historically that wasn't the case by the looks of it here. We've definitely changed the whole culture here and they admit that we've brought that on board. And yeah, we're working as we're going to continue to do so. But I know that a lot of injuries have been prevented definitely by the culture we brought to this site. And that's how we work.

Researcher: [00:05:35] And does that then flow on to other impacts such as customer satisfaction, employee engagement or financial performance, do you think?

Interviewee 4: [00:05:45] Yes. All do that I think. It all ties into one. Obviously, people think that safety costs money. But I know that from previous employers. They think that it's costing you money. But in the end of the day, it actually saves your money, as we will know, because when someone gets injured in the role, it affects huge for the families all the way through the employee. And I know that firsthand. Yeah. So, yeah, definitely. I think it's all of those things.

Researcher: [00:06:13] Through the review of the data in the online surveys that were done, as well as some of the sense-making workshops that have had with 17 employees across the business so far, a few words or phrases sort of came out - common words or phrases came out of that review in those comments and feedback specifically around Programmed's safety leadership and perceptions on the culture. So, I just wanted to share a few of those words with you in alphabetical order and give you the opportunity to have a look those. If you agree with them or disagree with them or to them, feel free to do that. So, it included words like caring, collaborative connection, cooperation, empowerment, learning. No blame, personable, respectful, reward good behaviour, takes action, teamwork, transparent, trust and walk talk. Thinking about those words and I can turn it around, so you can see them again in your own time. Are there any that stand out as being more important than others or that relate more to safety leadership.

Interviewee 4: [00:07:46] One thing, again, I've noticed is the care. I would say caring for one as well. If even if it's personal, in our personal lives as well as on site, management have always been caring about the person. Yes. An example, suppose is that at the moment Justin's going through a tough time with his mum being in palliative care, and obviously I've always put the personal lives and family first, but that's also been made very clear from my management obviously of Paul and Nat making it very clear. But even at times I've had my parents were in car accident not long ago and Paul found out and rang me instantly and straight away was all care about that regardless of anything else. So that's what I found. It comes in safety as well, but Programmed's always for the worker rather than the money side of it all. So that's a big one.

Researcher: [00:08:49] I guess does that for you summarise that that culture of Programmed?

Interviewee 4: [00:08:55] Yeah, definitely. That's why I've told everyone, as I've been trying to promote to people to work for the Programmed is that they are a company that looks after the individual and they're not just there for the dollar signs at the end of the day.

Researcher: [00:09:08] Perfect. Over the last twelve months or so, there's been a number of activities undertaken as part of the project. So, have you been a participant in or facilitated any of the following activities? Authentic Safety Leadership Workshop. After-Action Reviews or Learning Teams?

Interviewee 4: [00:09:33] We've done After-Action Review. And I was in the workshop, obviously with others.

Researcher: [00:09:38] I got a couple questions relating specifically to those two things. So, thinking about the Authentic Safety Leadership Workshop, it's obviously a few months ago. So, I don't expect you remember everything that happened in that conversation. It was a slightly abridged version as well. For the Vic Minor Contract portfolios, that group. Is there anything from your recollection that still stands out for you from that? Or were there any takeaways that you thought were important? Immediately after that workshop,

Interviewee 4: [00:10:15] I remember it bit. It was definitely a good workshop and very informative. You did a great talk on safety at the time. All these meetings, especially even the recent one to do with the new contract. There's a lot of emphasis on safety, which is very good. It's not just brushed away. It's obviously pushed in us as a culture. Which I do like.

Researcher: [00:10:48] Do you find so part of the workshop proposed like a model of authentic or authentically leading safety in the business. Does a model of authenticity, does that align with how you either like to lead or like to be led?

[00:11:09] Yeah, I think so. Yeah, definitely. Yeah.

Researcher: [00:11:12] And you might have already discussed this previously in some of the previous questions, but how do you find safety is demonstrated authentically?

Interviewee 4: [00:11:27] Yes, definitely. Definitely does. It's something we thrive on I think. I've made sure we've done it here as much as ever, every instance. But I make sure I tell a team every time: if it's not safe, we don't do simple. So, and that's coming from obviously, management from the top all the way down to the bottom.

Researcher: [00:11:55] There were probably three key themes or things proposed as part of that workshop, specifically around encouraging people to create psychological safety. So safe environments for people to speak up. Providing or sharing vulnerability and also in sharing stories. Are any of those important in how safety is led and building the culture within the contract, either specifically here or within PFM?

Interviewee 4: [00:12:29] I suppose involving a trustworthy team where you can speak up and identify. It's something I've been big on. That if someone identifies a hazard, you don't brush it off and say. No, it's rubbish. It's taken. A hazard it could be really anything. Minor, to major, but minor and obviously taking a major very, very quickly. So, it's just basically letting everyone know that that's the culture you have got. Don't be afraid to talk up.

Researcher: [00:12:59] Thinking about After-Action Review... So, I guess we do pre-start JSEAs. We do the job and quite often just move off to the next job. Part of that After-Action Review piece was encouraging people to stop and think about what we just did. So, have done any of those maybe formally or informally with the team?

Interviewee 4: [00:13:22] Informally we do it all the time. See this is a complex site, so don't waste time, time to go through it. But we've always talking about it. So yeah, I've always encouraged the guys. Have a think about how the job went and how we could have done it better.

Interviewee 4: [00:13:39] And have you, have there been any instances of when you've done that job again, that you've used those learnings from a previous review or discussion.

Researcher: [00:13:49] Yeah, definitely. There's also a bit of manual handling here with beds and stuff like that, and a lot of different managers wanting things done straight away and without notice. So sometimes you can you obviously, can think about I'll quickly get it done without actually thinking there's a better way of doing it. So yeah definitely all the time we look at ways we can do it better next time.

Researcher: [00:14:16] How do you share those learnings or insights?

Interviewee 4: [00:14:19] As an example at the moment we're doing furniture removing the old display suite and making a new one. And me and Justin were here by ourselves yesterday. So, we started using the Programmed ute and found that was just taking too long and was a bit unsafe, was lifting them up higher. So, it was a matter of rethinking it and using a tractor with a trailer with a lower base and getting more stuff on. So obviously a bit more time effective. So, we found out pretty quickly a better way of doing it. And you implemented that straight away.

Researcher: [00:14:50] And that's sort of demonstrated that there's some impacts on health and safety by doing those reviews and it could be during the task or after the task, there's a benefit to the workers in doing that review?

Interviewee 4: [00:15:09] Definitely. Yeah, obviously it's timeliness as well as safety as well as. Yeah, it's just... We get a lot of jobs here a week. At the moment we're averaging 70 a week, so if we can get jobs done safer and quicker. We're all for it. Because it obviously relieves pressure of stressing, having too many jobs and so it rolls on a completely.

Researcher: [00:15:34] So that answers. Guess the questions for the three sections I want to cover all. Are there any questions that I haven't asked that you wanted to explore further?

Interviewee 4: [00:15:45] No, it's pretty much covered it pretty well I think.

Researcher: [00:15:50] No worries, thanks for your time. Chris.

E.2.5 Interviewee 5

Date: 1 March 2019
Location: Melbourne, VIC
Speakers: Two (including Researcher)
Duration: 50 Minutes 43 Seconds

Researcher: [00:00:09] As we start the conversation, can I get you to sort of describe for me your role here at Programmed, and how long you've been doing this sort of work for?

Interviewee 5: [00:00:17] Sure, so I'm the General Manager of the VIC / TAS business. We're split up into regional sort of leadership type roles. So essentially, I'm accountable for all the contracts in those regions. And accountable for the health safety and well-being for everybody who works on those contracts as well as financial, quality and other types of measures as well.

Researcher: [00:00:43] And how are you doing in the GM role here?

Interviewee 5: [00:00:47] The GM role for approximately two years. I think it's about two years at the end of March essentially. I got my five-year anniversary with the business, so my five-year anniversary is officially on Sunday.

Researcher: [00:01:02] Congratulations.

Interviewee 5: [00:01:05] Thank you.

Researcher: [00:01:06] And how would you describe the safety leadership within your business group. I guess the VIC / TAS region?

Interviewee 5: [00:01:16] So VIC / TAS, I guess we've... particularly over the last two years we've tried to have a strong focus on lead safety indicators. Fundamental belief that if you are engaging in talking about the safety that you will prevent incidents from occurring. So yeah, we've had a strong press over the last two years on lead safety indicators and we do that through our Noggin system, primarily by conducting safety conversations which we document, but also through worksite audits and quality audits as well.

Researcher: [00:01:58] And how do you think your part of the business compares to others within PFM?

Interviewee 5: [00:02:06] I guess you can look at the data and the data probably tells you that story pretty well. You know you, we conduct a lot more safety conversations than the rest of our business. So, I think the VIC / TAS business does between 50 and 60 per cent of all of PFM's safety conversations. And so that's something that we're proud of. It means that all our people are engaging in safety. It's not so much about volume per se. I guess the other metric that we like to try and measure is we call it contributors. So, it's the number of contributors to safety conversations, and we think that's just as important as the total number of safety conversations because that means we've got more people that are out and about talking about safety. We also have the fundamental belief that not every safety conversation gets logged. So, we're confident that there's more happening out there than what actually gets logged, but the fact that we are logging such a high number of conversations, I think is a strong indicator, as a safety sort of measure of the business.

Researcher: [00:03:14] And for you personally what does it mean to be a safety leader in the business?

Interviewee 5: [00:03:19] I mean essentially for me I guess safety really is quite simple. Every person who goes to work should be able to go home in that same condition at which they got there. So, you

know that means not hitting your thumb with a hammer, not falling off a roof, you know not getting your hand caught in a pinch point. You know all that kind of thing. But even long-term health and safety you know we've got a long and long policy you know because we want people to try and avoid sunburn. We have sun cream at all stations where we're trying you know get people to understand sun safety, hydration during hot days, working in shades, adjusting your work habits to accommodate their conditions like today's a really hot day so hopefully people are getting everything anything out in the open done early in the day, and they can be working the shade or preferably indoors towards the end of the day. But also, psychological safety or well-being I think is something that we started to have a bit more of a focus on, the well-being of our people. So, making sure that they're physically safe, but also psychologically safe as well. So, I think that's probably part of the next frontier that we need to push into a little bit more.

Researcher: [00:04:44] And how do you feel that you demonstrate your safety leadership with your guest direct reports in the business?

Interviewee 5: [00:04:53] I guess you do that we do the traditional thing. So, we spend time talking safety. We have a safety moment to kick-off sessions and meetings. I think primarily I probably spend more time in, than my peers, talking about safety. At the, I went to the airport the other day and I held a toolbox session at the airport where I spoke about my safety story. I would feel like we all have a story. We have something that shapes the person that you've become. You know mine was sort of shaped by dealing with a fatality when I was quite young in my career. So, I therefore saw the absolute worst thing that can happen, you know, when someone comes to work and then people having to, you know, tell their family that that person is never coming home again. And that sort of shaped my safety journey, and my story. And I try to share that story as much as possible because I think being open with your team and trying to explain why it's important, not just saying: it's important, because you can say a lot of things are important but it's about articulating why it's important. And I think that message has been quite strong and encouraged others to share their sort of stories, and I feel, so I guess that's how I try to lead. But also, I want to try and be looking for the next opportunity, that could, where as a business we could say that we are leading in this area. You know so for example we've done an audit across all our management plans are on all our contract to try and identify our gaps. So that's procedurally driven, but you know, how do you expect people on a site to behave if you don't have an appropriate safety management plan on site. So that's part of the reason that we conducted that it.

Researcher: [00:06:59] A number of organisations and good talk about safety culture. What does the term safety culture mean to you?

Interviewee 5: [00:07:09] I guess culture is in some ways it’s kind of like, you know, it's the it's the heartbeat of the organisation. It's... It's when people think of the business, what do they get drawn to? And yeah. And I think Programmed has a very strong safety culture. It's very, I think our safety leaders right at the top of our business, the Managing Director Chris Sutherland and Group General Manager Safety Malcolm Deery, in particular. I think they're both really strong visible safety leaders. They're available at any time. I could get them out to any one of my sites within the next month if I asked them to. And I think that's a really powerful message for people at the coal face to be seeing, you know, a senior executive out at the coal face talking safety with them. So, they that they've created this culture where it's basically you know they walk, they walk the talk. And that's really important. It's not just executive talk and then directing at somebody else, and it's somebody else's job. That they take responsibility and accountability for that.

Researcher: [00:08:23] And do you think that filters all the way down to the contract level or are the differences in particular contracts?

Interviewee 5: [00:08:29] I think... I think particularly it does to a point, but I think, I think where it's strong it's because I guess at my level, if we talk about safety a lot and we use these examples a lot, I think it gets to the executive level really strong. I'm not sure or at the penetration from the executive level down to the next layer, to be perfectly honest... And some contracts with we better than others, because they may have had exposure to a Chris Sutherland site visits or a Malcolm Deery site

visit. And some people that have been with the organisation a little bit longer, as you get exposed to an organisation a bit longer probably see it more than others. But yes, I think it can. But I also think it's sometimes it gets to a point where it needs to be pushed down again as well. And I see that's my responsibility as the executive leader for this business unit.

Researcher: [00:09:32] And do you think that safety leadership affects more impacts on the overall performance of a contract or your business group?

Interviewee 5: [00:09:39] Wholeheartedly. I guess you can look at if you want to look at it pragmatically, if you, if your data is poor, if you know your, TRIFR is poor, LTIFR is poor, it makes it really hard to secure new contracts. Because with every contract that you try to secure moving into the future as growing the business. A lot of our contracts are government contracts and they're quite heavily related to safety performance. So, having good data is important to help grow the business. But, yeah, I think it's, I think to be honest it's yet to really important.

Researcher: [00:10:20] Is there any ways that also impacts on customer satisfaction or employee engagement?

Interviewee 5: [00:10:26] Excellent point. I guess two years ago when we took over the business one of the way... So, it's probably fair to say that the business unit that I'm in control of was performing poorly. If you look at net promoter score, which is a measure of customer satisfaction, I think we're at minus 21 at that time. So, it was a really low baseline. One of the things that we one of the things that we did when we first got involved in in trying to understand the business and turn around performance, and not necessarily performance up but I'll use the word perception, because perception I think is a really strong word. Is that we increased, we've had a real focus on increasing the number of safety conversations some lead safety indicators. And that achieved two things. It meant that we had people that were going out and talking safety which hopefully meant we had a safer workplace, but also one of the things that we did is we took that data and give that data to our customers, so our customers could see - hey, look at what we're doing here. It was a measurable metric that we could use, and yeah, it's a good point. I do believe it's really helped turn around our customer perception. In the recent net promoter score, which is October 2018 the VIC / TAS business unit, so we've gone from the minus 21 to 32, in the two into years. So over four survey periods, and a big part of that is our safety performance, which is always recognised. When you get into the detail of what that 32 means, one of the highest attributes that we always get is our is our safety performance. So, our customers definitely see that. Yeah most definitely so for retaining contracts it's a vitally important.

Researcher: [00:12:17] And then it flows on to financial performance as well?

Interviewee 5: [00:12:20] Well the facts are, an LTI cost the business approximately fifty thousand dollars. When you look at all the time invested. There is an expense to having an injury. If we have an incident you know then then I'm sending Tim out to do investigations, and business kind of stops for a couple of days and we focus on the investigation, and we try to understand why that happened? How can we learn from that? How do we stop it from happening again? So that there is a significant contract disruption when an incident occurs. And that's just an incident. It might be a high potential near miss, like we had at the airport the other day. But when an actual incident happened, you know there's a lot of, there's a lot of cogs that start turning to deal with that. And if there is there can be significant impact to the business both in operational performance and financial performance.

Researcher: [00:13:18] Within the surveys over the last year and a half, there were some free text fields that people could respond into. I shared some of the preliminary data with a sense-making workshops of last couple of weeks and some of the themes around perceptions on safety leadership or the leadership. I was able to distil down into a couple words or phrases. I wanted to share those with you and get your thoughts on whether or not you agree with them or wanted to build on any of those themes. So, I'm listing these in alphabetical order for convenience: caring, collaborative, connection, Corporation, empowerment, learning, no blame, personable, respectful, rewarding good behaviour, takes action, teamwork, transparent, trust, and walk the talk.

Interviewee 5: [00:14:22] There they're all quite powerful adjectives aren't they. To be honest, you know, if that's the general thought amongst the team as to where we are, I mean that's... I mean they're probably powerful words to what we aspire to be. They, it's nice to hear that because sometimes you see came through and you get an appreciation you go out and conduct safety toolboxes and things like that, but you don't sometimes get that feedback. So yeah, it's nice to get feedback that the message is coming through.

Researcher: [00:14:57] Do you think we hit that 100% of the time or is that?

Interviewee 5: [00:15:00] No, look I don't think we're perfect all the time. Far from it. I think we've got opportunity for improvement. And that's really probably why it's pleasing to hear some of some of those sorts of adjectives to describe it. There potentially may have been some other adjectives which weren't you know which weren't so great. And at the end of the day a lot of that comes down to employee engagement as well. And sometimes you find an employee that's not engaged will be looking for excuses and looking for reasons... and a big part of being not engaged. Safety can be an easy an easy area to blame. You know, you're making this too hard for me, or this is impractical, or we never used to do it this way. I mean you hear a lot of that kind of sentiment. It's interesting. I sort of refer to it... I'm a father, and I have a 11-year-old and a 13-year-old, and I love, one of the things I love when I go to school when I see them and getting into broader topic is a lot of diversity. There's another one in my areas of passion. And you know my kids and their peers, at the moment and this might change, but they don't see colour. They don't see race. You know whether kids Chinese, Australian, South African, Indian, Sri Lankan, Malaysian, whatever. I just they just see them as people. And I find that fantastic and sometimes I sort of I feel like that the younger that you can get people on board, and you know they have just different attitudes and culture. And I find what we're trying to do what a lot of our workforce, we are trying to bring a younger workforce in, which does support our business. We're becoming a more mobile business and becoming more technology-based business. And by bringing young, youth into the business, I think you take away... They don't know anything different. They don't know what time where, you know, you couldn't you couldn't just use a you... they don't know a time where you didn't never have the tie off the ladder. They don't know a time where you didn't have to wear safety PPE. So, I feel like, as the new generations come through we're sort of moving past a lot of those, I'll call them old school excuses. And I think that's one of the areas, one of the reasons I'm really passionate about bringing youth through the business. Because I think the more, the more you... When you can reach that critical mass where you've got that people through the business where this is just what they know, it's you know, those people that provide those old school excuses the reasoning, they're just not accepted or tolerated by their peers. And I think we're sort of getting to that point within business. From a safety perspective I think that's quite exciting moving forward.

Researcher: [00:17:56] So it's allowing them to know you don't have to settle for unsafe workplaces?

Interviewee 5: [00:18:01] Yeah.

Researcher: [00:18:07] Is there any of those things that you think are more important? I'll turn it around, so you can read that again. Are there any that's that stand above the shoulders of the others or...?

Interviewee 5: [00:18:21] I guess if you, if you look at all of them they're all good words. I mean I like it when I see trust. You know because I mean we've all heard the term, the workers and the managers kind of thing so, trust is it is always it's difficult trait to build and it takes time. You don't establish trust in a week, but you can lose trust in a week. So, I always look at any relationship. That trust is a really important attribute that I seek. And if there's a level of trust, in the coalface / workforce, that what we're trying to do is the right way of going about it. To me, that's probably the most impactful word that I see there.

Researcher: [00:19:13] For you, and your I guess experience of Programmed and beyond, is trust something the you have to give before you get?

Interviewee 5: [00:19:27] It's an interesting question. I think... I think trust is, is it's something that takes a period of time to establish. And it's incremental growth. Right. So, you know one good thing happens and goes into the memory bank. The person remembers it from the next time, okay. and they drop their barriers just that little bit the next time. So, I don't think it's something, I think, in fairness I think trust is earned from both parties. Although I think a sign of good leadership is that you generally have to be the first person to, I guess, break the barrier down and trust the person. I think that's a sign of good leadership in order to do that. And one of the things, that I guess it just in me becoming a better leader is, is for people not to have to work so hard to earn my trust, and then have more faith that I have good people around me, and that those good people will naturally do what they need to do and that just that's my own management team, all the way down to the work groups. I think that's something that I'm still working on. And I think there's still an element of building trust. But I mean, I think that's probably I would trust more. First before they would trust me.

Researcher: [00:20:57] I think almost 12 months ago there was a couple of authentic safety leadership workshops run with your leadership group and some of the 2IC / next level - some of the facility manager and coordinators across the business. I appreciate those a while ago, but was there anything that stood out for you from that workshop, or the interactions within that workshop?

Interviewee 5: [00:21:24] Probably the main thing that stuck out for me, if we tried to run that workshop two years ago it wouldn't have been very well received. So, I guess in the 12 months, in the 12 months that we that we brought in, I don't want to use the tern lead safety mandate, but in some ways it kind of was right. And you know the safety conversations were, in some ways with the pillar that we used to turn around the operational performance of the business. We used it because we have a good tool in Noggin and everyone has access to Noggin. So, there's no good reason for them not to log a safety conversation if they conduct one. And I think probably the thing that did surprise me a little bit was is the was people's openness and willingness through those sessions. Because I fundamentally believe that 12 months earlier, that we would not have had the same reception. No one put any opposition to it. And everyone thought it was a good idea. And everybody contributed. Even you know, some people that you probably thought might find it a little sort of confronting or a little bit too left of their normal right personality. You know I'll use the term touchy feely, a fluffy kind of thing. I think... I think that they were ready for it because we'd spent 12 months prior to it, basically mandating that everyone's safety was of paramount importance to us. And they realised that you know if that wasn't top of mind for them previously, it needed to become top of mind. So probably the thing that surprised me a little bit was people's openness and willing to contribute.

Researcher: [00:23:14] It's always good to have surprise. Positive surprises.

Interviewee 5: [00:23:17] Yeah. I think I mean I think at the time we were a little bit unsure how it would be received. But I think it was received overwhelmingly positively.

Researcher: [00:23:26] So the workshop proposed a model of authentic safety leadership. Do you think a model of authenticity adjusted your view on safety?

Interviewee 5: [00:23:37] I think it seemed, authentic to me means being your true self. And I think some people, perhaps think that you are, their true self. They are who they are, and they can't change. I think this is a great example where people can change. And what the process has taught me I think I've... Personally I feel like I've always had a strong personal commitment to safety. And that comes through with the way that I act, in the way that I talk, and the way I conduct my own business. But not everyone is that way. And I think, so through the process, the process supported my authentic safety leadership very well. I thought you know from that perspective it worked well. But what I think is, it made others think about how people who probably never thought about it before we have we are a blue-collar business, and we do have some you know some people that need you don't most turn them old school and whatnot. And I think it made them think about well, what is my story? What is my what is my why? And what is my authentic safety leadership about it?

And I think I personally think that just the process has been really good for them. And you know in that sort of that path of self-development, and in this in this really critical area for our business.

Researcher: [00:25:10] So have you seen some changes in your direct reports or in your leadership?

Interviewee 5: [00:25:19] I'm not so sure that... I don't think personally I've changed. What I do have is, I have more confidence in, if there's anything that we wanted to do, we'd have no push-back. And that's probably more of a function of the team around me have grown and developed in this area. So, you know, within reason I feel like from a HSE perspective we could just we could literally go out and do anything right now and we'd have the full support, which is a very powerful position.

Researcher: [00:25:57] The Authentic Leadership has four levels of, four dimensions. That was sort of surveyed as part of the survey as well. It looked at self-awareness, relational transparency, moral compass or value set, and balanced processing. So, do we get all the information before decisions are made. Are there any... Do any of those require more attention in terms of leading safety, or successfully leading safety in an organisation? Or are they fairly balanced?

Interviewee 5: [00:26:38] It's a good question. I think... I think at the end of the day... Everybody means well when it comes to safety. But sometimes meaning well and your actions are really, there's a disconnect there. Sometimes you have to ask why? Why is there a disconnect? What is it that's causing that disconnect? You know no one has intentions to come to work and do something that would be considered unsafe. And I think, to be honest, it's probably different people there might be different factors. So, it just suggests that there's one overwhelming area. But I struggle with it because I think if you broke down you know all the characters that we that we work with, there might be different area for some compared to others. So, I'd be reluctant to say that there's a particular area or focus that we would need to have across the broader group. I think is sort of getting to that point now of individualism, and everybody is different and it's about understanding, at an individual level, you know maybe what is what causes the breakdown at times between the intention to do the right thing and actually doing the right thing? And we might be creating some of that. And that's part of, part of our part you know part of our awareness of being safety leaders. Are we putting too much pressure on getting things done in a timely fashion? So therefore, you know we're not planning to work appropriately. Are we not providing appropriate tools and equipment? Right. So therefore, we're expecting people to be doing things which are not necessarily the right thing to be doing. So, we still need to ask ourselves these questions, but I think now we're sort of getting down into that individual person as to what.

Researcher: [00:28:41] As opposed to more broadly...

Interviewee 5: [00:28:44] Yeah, and that's sort of part, part of the path forward for the business in some ways.

Researcher: [00:28:50] Final question or comment around the workshop that was run that encouraged you and you and your leadership team to focus on three things you might have already touched on in previous responses are: psychological safety, vulnerability, and sharing stories. And I think you've already spoken about what the importance of sharing stories. Do you think these are important in terms of building a culture within the business?

Interviewee 5: [00:29:24] Wholeheartedly. I mean, It's almost the definition of authenticity. In some ways by... sharing a story you are, you're being, you're putting yourself in a vulnerable position. You know, it's not particularly, and we are a business that's dominated - it's a male dominated work environment. And the truth is our average age is probably closer to 40 than it is to 20. So, you know we're in that prime, we're in that prime area where we've got lots of males that don't like to talk about things. They don't like to talk about things that are personal to them. They don't like to open up. We are the prototypical: Let's talk about the footy, you know, how geez it's hot today, and we talk. We talk a lot, but we're not talking sometimes, talking about the right things. So, I'm a huge supporter of people opening up and telling them, telling other people their story. Because it's sort of defined who you are as a person. You know everyone has a different path that they follow to get to

where they are today. So that act of sharing stories, and you know being vulnerable to your work workmates, is really important. Someone told me, I learned something the other day, was talking about vulnerability. And vulnerability is, people look at that as, traditionally it would be looked at as sissy, or for being a bit of a pussy or... But it's actually, it's actually a really, really brave action. Because what it means is you're putting your emotional sort of front out there for people to judge. And for people to listen. And you're putting yourself in an uncomfortable position. And any time you do that I think you grow. You grow just a little bit. And I think, I think since we conducted the workshop there's been a number of people that have grown in this area because of their ability to share their stories. And you know, because they have to think about who they are how did they get to this point. What, what does define measure? What am I willing to accept? Is this something that I'm passionate about? is this a good thing is it a bad thing? So, by forcing them to you know have to have these sort of thoughts, and then they come up with their stories, and sharing those stories will help other people relate to why they, why they are like this. We talked about it earlier. it's the not just telling you what to do, but we're telling you why. And why what's important to us. And hopefully it'll resonate with them as well.

Researcher: [00:32:16] I can think of at least three people within your leadership team that regularly do it.

Interviewee 5: [00:32:23] Yeah, I think it's really important. And yeah, it helps people relate just in general. You know because as you get to know somebody in a more personal, and a deeper level, you know, the relationship grows stronger as well. So, your ability to work closely with that person, your ability to be able to perform together increases. So, I mean, it's not to be honest, it's not just the safety benefit, it's a benefit in delivering better operations. Because by working together more closely, by understanding who that person is and what makes them tick, they naturally work better, and they deliver it more productive, and they deliver a better service. And so, I feel like sharing the stories and putting yourself in a vulnerable position, is not just a benefit from a health safety and a psychological safety or well-being area, although I think it will help all of those three things. I fundamentally believe it creates better operations. And if you look at our business now our performance is exponentially better than it was two years ago and not all that... I'm not attributing everything to that with the focus that we've got on lead safety indicators, or the safety sort of path that we've followed over these last two years. But I think a big part of it safety was the sort of ten peg that we staked into the ground two years ago and we said we needed to change, and it was the driver for change. And since then there's been a lot of other drivers for change, but that was that was the first thing that the first sort of tent peg that we stuck in the ground. And we've really, I think fundamentally, changed the operational performance and the financial performance of this business as a result.

Researcher: [00:34:17] So you mentioned that focusing in on the health and well or the mental health and wellbeing space or the psychological areas is that next frontier. Are there any other areas requiring further work or attention?

Interviewee 5: [00:34:35] I think psychological safety is the is the obvious one. Purely because I think as we're becoming a lot more aware of people that their emotional wellbeing... And when you ask the question is someone fit for work, generally it's always been thought of well that person has a sore ankle you know, so they probably shouldn't be on their feet all day doing whatever activity it is that they need. And we probably never really thought too much about, well, look that person has, you know, had a significant challenge in their, in their relationship, or there's been an issue with a family member, or something along those lines. And fundamentally you know those types of impairments can be more challenging than someone that might be hungover or someone that didn't get enough sleep last night because their minds not on the job. So, I guess we're starting to understand that you know the appreciation and, you know, the correlation of people that are mentally healthy as well as being as being fit for work from that process. So psychological, so I think we're only scratching the surface to be honest and where we need to be. I feel like we've come a long way in the last 12 months, but I feel like we've got a long, a lot further to come. And I think in our business and the sort of next frontier also is, a lot of what we've done in the last two years is being driven top down. So, call it executive driving down through, you know, contract management,

driving down through supervisors, then driving down to the coalface. In some ways we've, you know, in the future we've probably got to invert that a little bit and start getting a little bit more feedback and start getting the coal face to be driving the message a little bit. And I think when we start to get to that point there, then I would consider that we are high performing in this area. We've looked at, we've looked at systems or processes, sorry, you know health safety management plans - service delivery plans. So, we're sort of going through that at the moment. We've had the lead safety indicator focus, which is good. We've had a very strong you know executive level top down focus on safety and then that. So that's next.

Researcher: [00:37:20] Getting that groundswell from below?

Interviewee 5: [00:37:22] Yeah. Yeah. So, with that I guess the Health and Safety champions within our business, we're starting to recognise those at the ground level that are about health and safety champions. And I think you know in some ways it's going to be getting them getting Kyle Kneebone out to the airport, you know, to stand out in front of them and explain what's important for him, what's his safety story? You know he's an apprentice that's conducted, you know, so young person has conducted more safety conversations with anyone else in our business in the last 12 months. Overwhelmingly right so, you know, I think as leaders what we need to do is to get back that sort of coalface, those leaders of that area and we need to grow and develop them a little bit better and have them face the future champions for safety in the workplace. Because they're the ones that are at the risk. They're the ones delivering work, and that is where our risk is - in the delivery of service. They are the ones that are there. I think somehow, we need to figure out a way to, to make and improve in that area. And we'll have some improvements in the wellbeing space. I fundamentally don't believe that people ask for help enough. So, it's about getting people to recognise when they might need help. So hopefully look at getting some support is almost being like preventative maintenance rather than waiting for something to break and then having to go into a fix. You know and out and now we have to break it down into that terminology which everybody understands. But, I fundamentally believe the use of our employee assistance program is really underutilised, and it's a great service, and I still don't feel like the business really understands all the services that might be available to them. And I think that's probably the next phase in, it's almost like your emotional coaching in a way. You know where we become a little bit more emotionally mature. As a business, as an executive, and right down to you know trades who work on the ground. And then at that point there, I mean that's the sort of ticking off physical safety, psychological safety, systems processes, you know you've got to really high performing team at that point.

Researcher: [00:40:02] Are there any opportunities for more broadly PFM or maintenance as a result of what has been achieved over the last 12 to 24 months here in VIC/TAS?

Interviewee 5: [00:40:18] Look of course, yes most definitely. It's probably, it's whether those safety leaders are looking to, you know, be as focused in this area. I think that's what it comes down to. You know we've approached this with some fundamental belief that you need to walk the talk and get out there and talk safety. And I think everyone would, has those good intentions. But there does appear to be a bit of a disconnect in other areas. And whether that's a resource issue, a process issue, a system issue... I mean I'm not here to judge, you know, why that would be the case. But I think by running an authentic safety leadership process where you are actively encouraging your leaders to share their stories, show vulnerability and be actively involved in the psychological safety of all their employees, it can't be a bad thing can it? So yeah, I do believe there would be a benefit across the wider business.

Researcher: [00:41:37] And my last question, which I primed you for before we started, was are there any questions I haven't asked that you wanted to explore today?

Interviewee 5: [00:41:45] Nah, look I think you've been pretty concise through your question process. No, look um, look for me it's been a great process for us to go through as a business. Maybe if you had your time over again now, knowing what you know now, would you have changed the way that you went about undertaking your endeavour? Obviously...

Researcher: [00:42:19] Flipping the interview now?

Interviewee 5: [00:42:21] Well you asked me. We obviously have a lot more information now, right, and we know people a lot better.

Researcher: [00:42:26] I probably would have engaged Graeme a little in a different way. And maybe your peers just to keep them in the loop early. So that would probably be a learning piece. Again, just around having a more regular, steering committee or update them...

Interviewee 5: [00:42:53] Potentially could have been rolled out across a larger sample size?

Researcher: [00:42:57] Potentially, or at least, keeping everyone in the loop along each of the stages. The other piece would be around, can it be done in a shorter timeframe. And there's aspects that I think yes. So, we started this project three, well I started three years ago, early this week. And this first survey didn't come out until September 2017. So, you know, that could have been done a little bit early. Or could be that a bit later, but if we'd done earlier or in a different way would we have had the surprise that comes inside the workshop last year?

Interviewee 5: [00:43:42] Yeah. Whether the business was ready is already at that point?

Researcher: [00:43:45] I don't know.

Interviewee 5: [00:43:47] It's a good question. And may also help your results too. Because I think one of the things you'll find with your results, particularly maybe with some qualitative data, is that the perception from the original workshop was that things were pretty good in and so therefore you started from a higher baseline. If you started a bit early and maybe you start from a lot of baseline so therefore you would get better qualitative results, in theory.

Researcher: [00:44:14] So it's a bit of a, it's a weird one. This is where the project itself is fun and exciting, but also a bit of a challenge because it is messy and it's a dynamic workplace. We've had contracts that have been lost over that time, but we also have new contracts come in. So, shifting of personality, demographics have changed over the last two years, in terms of your leadership team, and the future is looking really exciting too. So there, that wouldn't have happened if some other things didn't happen over the last two years as well. So, it's weird space in terms of, how to do it? But I think the model for doing projects in terms, of what's the data saying? Use that to make a decision, rather than just read a paper and this says... this article in HBR says we should be focusing on authentic leadership... let's do it. But what's the data showing you?

Interviewee 5: [00:45:16] So how when, you mentioned that there's been some change in leadership and whatnot, how when new people come into the business, how do we get this message to them?

Researcher: [00:45:29] That's... I guess that's the challenge. So, one of the ways that I've seen you doing for, so mobilising Make Safe - partner Chris up with Tash, having some mentoring pieces there I think is useful. Probably a good person to partnering up with, because he's one of the ones that I think shows a high level of vulnerability and sharing stories and authenticity with how he operates. He's one of the weird cats across the contract group that will just do it. And, I think that's go for his team and I think will hopefully flow across into someone like Tash. The other changes that have been made, say at City West Water, a stronger leader in that space as demonstrated an improved team performance, so there's... it's just a matter of trying to pull that out in terms of how do we do it. So that would hopefully be a recommendation or at least an action plan out of the report. I now have to write and do some work on.

Interviewee 5: [00:46:37] How do we, how do we achieve the final sort of stage that I see of this? How do we go into getting the safety leaders at the coalface more exposure across the business to share their stories and vulnerabilities? And how do we go about that?

Researcher: [00:47:03] So I had in my mind an idea of maybe getting some of them together in a room. So, we do obviously our monthly HSE management review meetings. But maybe setting aside a different forum to get HSE champions into a room to share stories and make some networks within each other, themselves. I like the idea of getting, like a Kyle out to the airport, or a Leigh Matthews down to your Yallourn or maybe City of Casey, and get him getting that sharing happening. It's simple, doesn't really cost much.

Interviewee 5: [00:47:45] I like the thought that. Might be something, something for you to own moving forward I think. Maybe it's something that we can put forward in the next HSE session as a as a continuous improvement.

Researcher: [00:47:59] But I mean that's one of the things I've enjoyed over the last two years. And this is moving away from the project and something that just happened to enjoy, is when I started with Sue, safety was 5 minutes on you contract manager's meeting. Okay well, the update is this and everyone just sort of moved off - it was pretty brushed over. And you're right, the stake in the ground change that to being, an hour, an hour and a half, two hours depending on how long...

Interviewee 5: [00:48:29] However long it needs to be.

Researcher: [00:48:30] However long it needs to be, it will be that long. And it's like, well, that's awesome, that's how it should be. But it takes the leader to do that.

Interviewee 5: [00:48:41] Yeah. Well we needed something didn't we?

Researcher: [00:48:43] So thank you, that helps, because it drives my agenda. And you know safety's job but it's everyone's passion.

Interviewee 5: [00:48:52] Well let's bring that that, that... I reckon I'd love to get everyone else's feedback on something like that, because I think it'd be good for the development of our team as well.

Researcher: [00:49:03] Because someone like a Dale's already kind of doing it.

Interviewee 5: [00:49:06] Yeah well. He's sort of in a space there right. I mean you know that's good that he's done that he's taken it on. But, like yeah, if you take a Mick Fosdick at City West [Water]. You know, if Mick went to Orica, or you know, sat down with Ron and all Ron's team, right. And you know, they just sat down, and they talk about what does safety mean to me. Sharing stories and whatnot. I think...

Researcher: [00:49:33] And then you'd sort of rotate around this doesn't have to be difficult. And you know it's opportunity for that person to go out and have three or four safety conversations, almost like your executive work arounds. But you're doing it more like grassroots sort of style.

Interviewee 5: [00:49:50] I think some of the, some of them would be really, you know... I think some of them we really energised by it, to be honest. I think they'd really appreciate the opportunity to do that, and the recognition that we see them as a safety champion within the business. So, I think somehow, we have, we need, I guess we need to sort of package up together. You know, when you might have to list the safety champions, you know, how do you become a safety champion? You know you've got Neil from Yarra Valley Water and you know, might go to Dulux. I don't know what it is, but we have, we have that recognition and then as a group and you know it doesn't have to be something that's a huge burden on them.

Researcher: [00:50:29] Should be fairly straight forward....

Interviewee 5: [00:50:30] Yeah, it's half a day, you know, once a quarter for them potentially.

Researcher: [00:50:34] And it's a learning opportunity back for that contract too, as well as them personally.

Interviewee 5: [00:50:40] Something to think about.

Researcher: [00:50:41] Now you're just giving me more work..