CAREER MOTIVATIONS OF MECHANICAL TRADE STEM WORKERS IN AGRICULTURAL OCCUPATIONS IN REGIONAL AUSTRALIA

A Thesis submitted by

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ABSTRACT

The development of Australia's agricultural workforce is central to food and fibre security, and the national economy. Workers within middle skilled professions, such as mechanical trade workers educated via Vocational Education and Training (VET) pathways, are underrepresented in career development research. This research aimed to understand the psychological factors that influence career motivations of mechanical trade Science, Technology, Engineering and Mathematics (STEM) occupations in Australian agriculture. The research design was situated in an emergent paradigm, the Vocational Psychology of Agriculture (VPA) and utilised the Social Cognitive Career Theory (SCCT) to formulate research questions and hypotheses. Integrative SCCT modelling of persistence enabled mapping of the relationships between seven predictor variables: (a) personality and affective states, (b) contextual barriers and supports, (c) self-efficacy, (d) sources of self-efficacy, (e) outcome expectations, (f) interests, and (g) goal-directed activity, and their direct and indirect influence on satisfaction and persistence intentions (Lent, Miller, et al., 2016). A mixed-method exploratory sequential research design was utilised across two studies. Study One involved semi-structured interviews with a sample of 19 mechanical trade STEM workers, utilising thematic analysis to facilitate operationalisation of the core SCCT constructs within the mechanical trade domain. Study Two involved cross-sectional online surveys with a sample of 302 mechanical trade STEM workers, utilising multiple hierarchical regression and path analysis to test an integrative SCCT model of mechanical trade persistence. While the results were unable to support the role of self-efficacy in predicting satisfaction and persistence intentions of mechanical trade workers, goal-directed work effort was found to mediate the effect of ability-based outcome expectations on satisfaction. Satisfaction remained a key predictor of persistence intentions within the mechanical trade context.

CERTIFICATION OF THESIS

This Thesis is entirely the work of *Rebecca Leigh Black* except where otherwise acknowledged. The work is original and has not previously been submitted for any other award, except where acknowledged.

Principal Supervisor: Professor Peter McIlveen

Associate Supervisor: Dr Nancey Hoare

Associate Supervisor: Dr Nicole McDonald

Student and supervisors' signatures of endorsement are held at USQ.

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LIST OF ABBREVIATIONS

STEM	science, technology, engineering, and mathematics
VET	Vocational Education and Training
VPA	vocational psychology of agriculture
POW	psychology of working
SCCT	social cognitive career theory
ACCELL	Australian Collaboratory for Career, Employability, and Learning for Living
TAFE	Technical and Further Education
RIASEC	realistic, investigative, artistic, social, enterprising and conventional
USQ	University of Southern Queensland
JSS	Job Satisfaction Scale
OSS	Occupational Satisfaction Scale
POS	Perceived Organisational Support
SPOS	Survey of Perceived Organisational Support
SPSS	Survey of Perceived Supervisor Support
SPCS	Survey of Perceived Coworker Support
LEQ	Learning Experiences Questionnaire
MIQ	Minnesota Importance Questionnaire
WESC	Work Effort Scale
ASGS-RA	Australian Statistical Geography Standard
CFA	confirmatory factor analysis
CFI	comparative fit index
TLI	Tucker-Lewis index
RMSEA	root-mean square error of approximation
MCAR	missing completely at random
MAR	missing at random
MNAR	missing not at random

LIST OF CONFERENCE PRESENTATIONS

Black, R. (2019, May 22). *Career motivations of mechanical trade STEM workers in agricultural occupations in regional Australia* [Poster presentation]. Asia Pacific Career Development Association Conference, RMIT University, Ho Chi Minh City, Vietnam.

Black, R. (2019, October 2). *Social cognitive career theory (SCCT) and the development of agricultural mechanical trade STEM careers in regional Australia* [Poster presentation]. Institute for Resilient Regions Symposium, University of Southern Queensland, Toowoomba, Australia.

Black, R. (2019, September 19-21). *Utilising Social Cognitive Career Theory for Career Development of Mechanical Trade Careers in Agriculture* [Poster presentation]. Career Development Association of Australia National Conference, Hyatt Hotel, Canberra, Australia.

McDonald, N., Black, R. & Lovric, K. (2019, January 13-14). *Gathering evidence to help attract and retain Australia's agricultural workforce* [Symposium]. 2019 Food, Fibre and Agricultural Educators Conference, Hilton Brisbane Hotel, Brisbane, Australia.

McIlveen, P., Kossen, C., Black, R., & Lovric, K. (2019, May 21). *Zero hunger, sustainable development goal 2 depends on rural workforce development* [Symposium]. Asia Pacific Career Development Association Conference, RMIT University, Ho Chi Minh City, Vietnam.

CHAPTER ONE: INTRODUCTION

Agriculture is a significant and critical contributor to the Australian economy (Commonwealth of Australia, 2015; National Agribusiness Education Skills and Labour Taskforce, 2014; National Farmers' Federation and Sefton & Associates, 2013; Nelson, 2011). The Australian Government considers agriculture one of the "five pillars" of the national economy, prioritising the sector to assist with building the wealth of the country (Commonwealth of Australia, 2015). Efforts to build the profit, resilience and sustainability of the agricultural sector in turn, strengthen the Australian economy (Commonwealth of Australia, 2015) as well as the security and profitability of Australia's food and fibre supply chain (Cockfield & Courtenay Botterill, 2012).

The Australian agricultural sector is linked to contributions across sectors of the economy (National Farmers' Federation, 2012; Nelson, 2011). The sector generates wealth and employment (Worsley et al., 2015), as well as increased job roles, income, and community services (Commonwealth of Australia, 2015). Development of the agricultural sector is considered fundamental to a robust economy (National Agribusiness Education Skills and Labour Taskforce, 2014), with economic growth associated with societal as well as individual well-being (Department of Infrastructure and Regional Development, 2016). The agricultural sector faces significant challenges for the future, including increased production demands, altering consumer preferences, and technological advancements in the context of increased environmental considerations (Commonwealth of Australia, 2015; Spence, 2016).

Australia's Regional Workforce

Industry and communities in regional and rural Australia experience labour challenges, limiting productivity improvement in vital industries (Daly et al., 2015; National Farmers' Federation and Sefton & Associates, 2013). Vital industries are linked to regional sustainability and renewal (Cameron, 2011). The development of regional Australia is seen as

central for Australia's capacity for economic growth, as well as for Australia's food security, and contribution towards global food and fibre production; however, regional Australia is considered to lack the necessary labour force for achieving this growth and developing to its' full capacity (National Farmers' Federation, 2011).

The agricultural industry has struggled to attract and retain the skilled and semi-skilled labour force it requires to prosper (Commonwealth of Australia, 2015; National Agribusiness Education Skills and Labour Taskforce, 2014; National Farmers' Federation and Sefton & Associates, 2013; Nelson, 2011), particularly during seasonal fluctuations and adverse weather conditions, such as droughts, floods, and natural disasters (National Agribusiness Education Skills and Labour Taskforce, 2014). Skill shortages and workforce inflexibility have been related to limits with the capacity of the agricultural industry to improve productivity (National Farmers' Federation and Sefton & Associates, 2013; Nelson, 2011). Those production gains should be sought through building the human capital of the agricultural industry through extending labour and technical skills of the workforce (Commonwealth of Australia, 2015; National Farmers' Federation and Sefton & Associates, 2013; Nelson, 2011).

It is considered critical that the agricultural industry has an adequate and skilled workforce in order to meet industry needs, as well as regional sustainability, and national productivity (Nelson, 2011). Skilled labour is linked to education and training systems within the industry (Commonwealth of Australia, 2015; Nelson, 2011), driving the innovation and growth that underpins Australia's agricultural sector, regions and national economy (Nelson, 2011; Spence, 2016). In order to meet these challenges, the agricultural sector requires a well-educated and skilled workforce, who have access to advanced technologies, practices and capacity to drive organisational change (Australian Government Research Council, 2014; Commonwealth of Australia, 2015; Daly et al., 2015; Pratley, 2012, February).

A diverse and skilled labour force is vital to utilising technological advancement and latest research practices, allowing the agricultural industry to remain internationally competitive (Commonwealth of Australia, 2015). Establishing agricultural career paths that are financially stable, competitively packaged, and provide opportunity for structured advancement pathways is considered vital in addressing labour force attraction and retention issues within the agricultural industry (Commonwealth of Australia, 2015; National Farmers' Federation and Sefton & Associates, 2013; Nelson, 2011).

Agricultural Careers

Careers within the agricultural sector include a broad variety of roles within the fields of broadacre farming, livestock farming, mixed crop, and livestock farming, production horticulture, wholesaling, conservation, and land management; as well as those aspects of the industry that support this production through the supply chain. The agricultural labour force requires skills at all levels, from unskilled, semi-skilled, to trades and professionals, across all fields and associated supply chains. Jobs within the agricultural industry include farm and station hands, vegetable growers, machinery operators, tradespersons, service technicians, salespersons, managers, production, and retail services, as well as agricultural scientists.

These vital agricultural careers sustain regional infrastructure and regional communities, yet there is little research into attraction and retention of workers across the broad range of careers within the sector. While previous sociological and psychosocial investigations in relation to the attraction and retention of workers in non-metropolitan areas of Australia have investigated factors, such as extrinsic motivators and living conditions in relation to skilled health professionals (e.g., Becker & Soosay, 2013; Cosgrave, Hussain, & Maple, 2015; Morell, Kiem, Millsteed, & Pollice, 2014; Russell, McGrail, & Humphreys, 2017; Russell, Wakerman, & Humphreys, 2013), vital infrastructure workers such as those employed within the agricultural sector have not been the focus of such attention.

STEM Skills

Science, technology, engineering, and mathematics (STEM) skills are considered critical to providing competitive advantage to established industries such as agriculture (Australian Government Office of the Chief Scientist, 2014c) and play a critical role in the competitiveness and adaptability of Australia's economy (Australian Government Office of the Chief Scientist, 2014a, 2014c; Marginson et al., 2013). Each of the STEM disciplines contains a diverse mix of fields, qualifications, specialisations, and relevant occupations, inclusive of occupations within the agricultural industry in Australia (Australian Government Office of the Chief Scientist, 2014a; Marginson et al., 2013; Rottinghaus et al., 2018).

Vital infrastructure careers within the agricultural sector require the use of STEM skills; which are taught and applied with an outcome focus (Australian Government Office of the Chief Scientist, 2014c; Marginson et al., 2013; Rottinghaus et al., 2018; Siekmann, 2016). The STEM agenda has global prominence with the focus on, support for, and strength of STEM disciplines considered to be imperative towards shaping the economy through boosting productivity, creating more and better jobs, and enhancing competitiveness (Australian Government Office of the Chief Scientist, 2014c; Marginson et al., 2013). STEM skills are considered to play a critical role in the competitiveness and adaptability of Australia's economy (Australian Government Office of the Chief Scientist, 2014a, 2014c; Marginson et al., 2013).

STEM education and training establish relationships between disciplines by supporting technical and scientific education, with an additional focus on critical and creative-thinking skills (Australian Government Office of the Chief Scientist, 2014c; Siekmann, 2016) and career adaptability (Rottinghaus et al., 2018). Each of the STEM disciplines contains a diverse mix of fields, qualifications, specialisations and relevant occupations, inclusive of occupations within the agricultural industry in Australia (Australian

Government Office of the Chief Scientist, 2014a; Marginson et al., 2013; Rottinghaus et al., 2018).

A focus on STEM-based innovation is linked to building resilience into Australian businesses, as well as the national economy (Australian Government Office of the Chief Scientist, 2013). Australians have been tasked with the responsibility of developing high-quality STEM enterprises to adapt to a changing environment, promote population wellbeing, manage food and water assets, secure Australia's position in a changing world, and to lift productivity and economic growth as a nation (Australian Government Office of the Chief Scientist, 2013).

A flexible skilled workforce, with a high level of STEM literacy and participation is considered necessary for STEM industries to thrive within the current environment of rapid technological change (Australian Government Office of the Chief Scientist, 2014c; Marginson et al., 2013). With societies as a whole experiencing technological change and placing greater requirements for improved goods and services, STEM enterprises should be valued in their innovative capacity for building the Australian economy (Australian Government Office of the Chief Scientist, 2013, 2014a).

As such, STEM skills are considered critical to providing competitive advantage to established industries such as agriculture (Australian Government Office of the Chief Scientist, 2014c). Through research and innovation, Australian STEM enterprises meet societal challenges by building, attracting, and retaining businesses that prosper in the global economy (Australian Government Office of the Chief Scientist, 2013). A flexible skilled workforce with a high level of STEM literacy and participation is considered necessary to thrive within the current environment of rapid technological change, particularly in the context of the challenges within the agricultural workforce (Australian Government Office of the Chief Scientist, 2014c; Marginson et al., 2013).

Mechanical Tradespeople

Tradespeople are skilled manual workers who require specialised STEM knowledge and skills. Consistent with broad trends within the agricultural sector, trade workers are increasingly requiring technical and advanced technological skills (Loveder, 2017; Rottinghaus et al., 2018). It is within this context, that Australian employers additionally report an expected increase in their needs for STEM qualified tradespeople in the future (Australian Government Office of the Chief Scientist, 2014a, 2015).

Within agriculture in particular, mechanical trade STEM workers are integral to supporting the industry's adoption of technology through their capacity to provide regional service and production support. Nationally, however, there are consistent skills shortages of mechanical tradespeople, such as mechanics and fitters, with regional employers experiencing greater difficulties filling vacancies than their metropolitan counterparts (Department of Jobs and Small Business, 2017a, 2017b).

Unfortunately, workers within middle skilled professions, such as mechanical trade STEM workers educated via Vocational Education and Training (VET) pathways, are underrepresented in career development research. Literature specifically focused on the career motivations of mechanical trade STEM workers is underrepresented in the field of vocational psychology. Under-representative worker sampling does not allow for accurate reflection of the labour market and workplace experiences, nor does it allow for an accurate understanding of the phenomena or constructs of interest (Bergman & Jean, 2016; Cannady et al., 2017). There is a large proportion of STEM workers trained through the VET system, yet these careers have been largely excluded from workforce research (Cannady et al., 2017).

Development of Career Paths

The agricultural industry has struggled to attract and retain the skilled and semi-skilled labour force it requires to prosper (Commonwealth of Australia, 2015; National

Agribusiness Education Skills and Labour Taskforce, 2014; Nelson, 2011), with poor or outdated perceptions of agricultural work as a career choice considered a significant barrier to attraction of skilled workers in the industry (Commonwealth of Australia, 2015; National Agribusiness Education Skills and Labour Taskforce, 2014; Nelson, 2011; Pratley & Hay, 2010; Rural Skills Australia, 2015; Turner & Hawkins, 2014). To address workforce challenges, agriculture must attract a highly skilled and diverse workforce that drives innovation and growth, while utilising technological advancements to address changing food and fibre production demands (Commonwealth of Australia, 2015; Spence, 2016).

Agriculture must be repositioned to use contemporary skills (Nelson, 2011; Rural Skills Australia, 2015; Turner & Hawkins, 2014) and provide significant career opportunities in the interest of the Australian economy, and food and fibre security (Daly et al., 2015; Nelson, 2011). The strong and resilient reputation of the agricultural sector must also be raised to attract talent and specialised skill sets to the industry, through image repositioning, career promotion, and the development of skilled agricultural career paths (Daly et al., 2015; Nelson, 2011; Pratley, 2012, February; Turner & Hawkins, 2014). Establishing career paths based in agriculture is vital to addressing labour force attraction and retention issues within the sector (Commonwealth of Australia, 2015; Nelson, 2011; Turner & Hawkins, 2014).

A Vocational Psychology of Agricultural Careers

The overarching psychological theories of careers, including the person-environment fit, social-cognitive, and constructivist frameworks have gained attention, with extensive research on a range of occupational issues for many years (Blustein, 2013; Duffy et al., 2016). Career development literature has increasingly utilised the social cognitive career theory (SCCT) as a theoretical lens on STEM-related academic and career behaviour (Lent et al., 1994, 2000; Lent et al., 2013; Lent, Sheu, et al., 2010; McIlveen & McDonald, 2019; Rottinghaus et al., 2018).

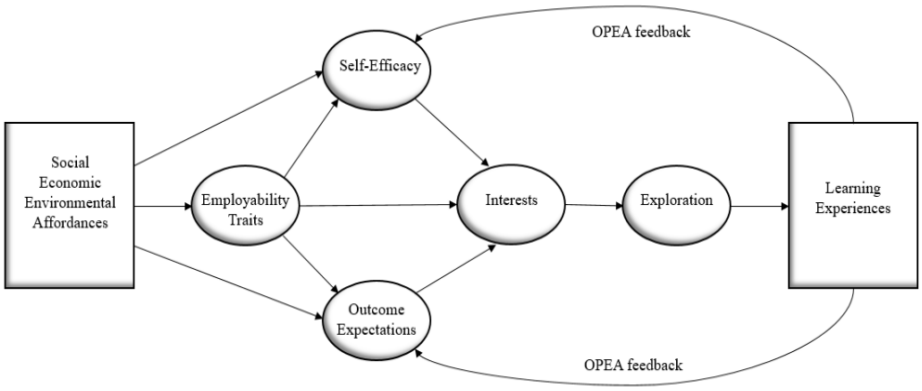
The Vocational Psychology of Agriculture – Farming Food and Fibre (VPA; McIlveen, 2015; McIlveen & McDonald, 2018) emphasises the vital role that vocational psychology should contribute to the agricultural sector, through addressing problems related to labour supply and work quality, and capacity to meet global food and fibre requirements. The SCCT's prominence in modern career development and vocational psychology research informs its utilisation as the guiding scientific framework of VPA research (McIlveen, 2015; McIlveen & McDonald, 2019). McIlveen and McDonald (2019) theorise a social cognitive model of agricultural career interest development (Figure 1), while building the argument that the SCCT is best placed to address research questions related to motivation and agentic behaviour within agricultural careers.

In addition to this scientific theory, the VPA is motivated by the ethical lens of the psychology of working (Blustein, 2006, 2013) towards the advancement of global human rights regarding access to decent work, while advancing epistemological contributions to agricultural career development (McIlveen, 2015; McIlveen & McDonald, 2018). The career development domain readies for further scholarship within social constructivist paradigms, such as inclusion of the psychology of working theory (Blustein et al., 2004; Lent & Brown, 2013).

Beyond the theoretical lens of SCCT, the psychology of working theory enriches existing career development theories by expanding their impact to a broader, more typical work context (Blustein, 2013; Duffy & Dik, 2009), with the goal of improving the quality and range of working experiences for all individuals (Duffy et al., 2016). The psychology of working proposes to broaden the relevance of current psychological theory, by including people with less than optimal volition in their work lives (Duffy et al., 2016).

Figure 1

Social Cognitive Model of Agricultural Career Interest Development via OPEA Feedback Loop



Note. O = observation; P = persuasion; E = experience; A = affective arousal

Adapted from "The vocational psychology of agriculture: Fiat Panis" by P. McIlveen & N. McDonald, 2019. In J. A. Athanasou & H.N. Perera (Eds.), *International handbook of career guidance*. Copyright 2018 by Springer.

An Integrative SCCT Model of Persistence

The SCCT was introduced 25 years ago and now consists of five core interrelated models of educational and occupational interest, choice, performance, satisfaction, and career-self management (Brown & Lent, 2019; Lent & Brown, 2019). Additionally, the SCCT offers an integrative theoretical platform that allows for the study of vocational persistence within the STEM domain (Lent, Miller, et al., 2016; Lent et al., 2013).

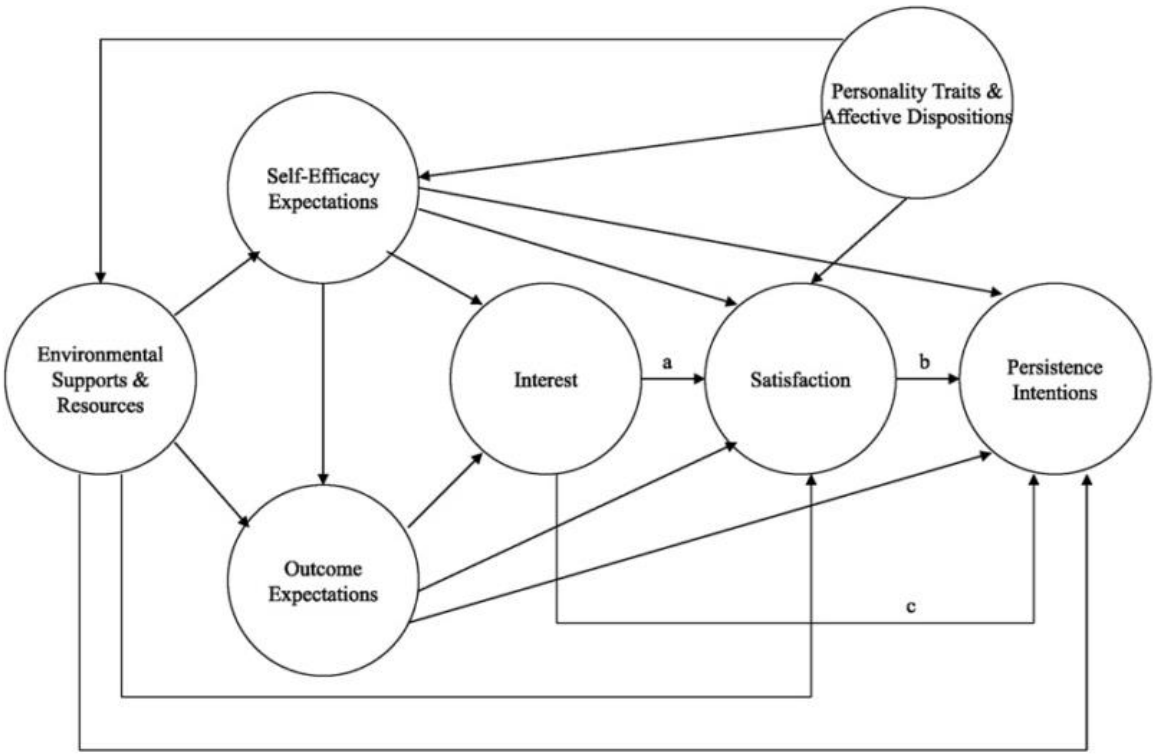
The interest and choice models centre around attraction to educational and occupational domains, while the role of performance model is to assist with predicting domain specific accomplishment (Lent & Brown, 2019). A further two models expanded focus on the role of the core social cognitive constructs to predict educational and occupational satisfaction, and aspects of career self-management (Brown & Lent, 2019). The career self-management model was developed to predict the process of how people manage developmental challenges such as job seeking, career exploration or retirement planning, which is not the focus of the current research problem (Brown & Lent, 2019).

While the satisfaction model has capacity to address aspects of the current research problem, satisfaction-persistence linkages have allowed for further inquiry and development of the SCCT through additional integrative modelling (Brown & Lent, 2019). Integrative SCCT models utilise the common core SCCT variables, including self-efficacy, outcome expectations, contextual barriers and supports, personality traits and interests; within the SCCT interest, choice, satisfaction, and performance models to predict persistence intentions (Lent, Miller, et al., 2016; Lent et al., 2013; Navarro et al., 2014).

The integrative SCCT model of persistence represented in Figure 2 has been theoretically supported within the academic domain of engineering (Lent, Miller, et al., 2016; Lent et al., 2013; Navarro et al., 2014), with outcomes consistent with meta-analytic findings in relation to the SCCT's interest and choice hypotheses (Sheu et al., 2010).

Figure 2

An Integrative Model of Interests, Satisfaction, and Choice Stability



Adapted from "Social cognitive predictors of adjustment to engineering majors across gender and race/ethnicity" by R. W. Lent, et al. 2013, *Journal of Vocational Behavior*, 83(1), p. 23.

Aims and Research Questions

Vocational psychology does not yet offer necessary the theoretical nor practical contributions to predicting the persistence intentions of mechanical tradespeople within Australian agriculture. The dominant theory of vocational psychology, the SCCT, is domain-specific, and, while SCCT research is emerging in the agricultural sector, the vocational psychology of agriculture (VPA) and the psychology of working (POW; Blustein, 2006, 2013) framework call for prioritisation of investigation into a broader range of careers in the sector. The current research project aims to understand the psychological factors that may influence career motivations, particularly career persistence, of mechanical trade STEM occupations (e.g., diesel mechanics) in the agricultural sector in regional Australia.

The project will address gaps in knowledge about the career motivations of mechanical trade STEM workers in agriculture. The research is conceptually based in the literature of vocational psychology and uses the SCCT (Lent et al., 1994) to formulate research questions and hypotheses. The SCCT research design is situated in an emergent paradigm of the VPA (McIlveen, 2015; McIlveen & McDonald, 2018) .

The current research project aims to address this knowledge gap in the discipline of vocational psychology by providing useful evidence to the agricultural machinery sector by deductively testing an integrative SCCT model of mechanical trade persistence. The main research questions this project seeks to answer include:

1. How can the core constructs of SCCT be operationalised in the domain of mechanical trade work in Australia?
2. How can the SCCT inform an integrative model of mechanical trade persistence in Australia?
3. How can these findings inform the attraction and retention of workers within agricultural machinery trade careers in Australia?

Anticipated Research Outcomes

Despite the global significance of the agricultural sector, vocational psychology is only relatively recently returning to the field via the VPA (McIlveen, 2015; McIlveen & McDonald, 2019), which offers new theoretical and practical contributions to efforts to attract and retain mechanical trade workers in regional Australia (e.g., McDonald, 2017). The knowledge generated by the present research will contribute to the agricultural sector's strategies and interventions to address workforce priorities in the coming decades. It is proposed that understanding factors related to the persistence of mechanical tradespeople within the agricultural industry would assist the sector to address workforce demands and priorities, and to build human capital.

Specifically, the current vocational psychology research project aims to develop the theoretical foundations of the SCCT and to further develop the VPA by testing an integrative model of mechanical trade persistence in a previously unexplored occupational group. It is anticipated that by determining the domain-specific factors that make mechanical trade qualified STEM career pathways in regional and rural Australia most attractive and rewarding to potential and current employees, strategies can be implemented to enhance motivation to engage with and persist in these careers.

The new knowledge will assist employers and industry sponsors to engage with and influence factors that both attract and retain talented workers in the sector. It is also expected that the research will directly inform industry education and human resource practices, as well as contribute to research that improves career development services for students in schools, Technical and Further Education (TAFE) institutions, and training agencies.

This project is significant as the findings will contribute to developing knowledge to strengthen the Australian labour force, even when that work is considered relatively less prestigious. Building the sustainability of the agricultural sector is imperative to

strengthening Australia's regional workforce and the national economy, as well as addressing increasing global demands for high quality food and fibre.

Organisation of the Thesis

Following this introductory chapter, Chapter Two establishes a rationale for the role of the SCCT in informing the efforts of the Australian agriculture industry to address workforce priorities of attraction and retention of mechanical tradespeople. A review of the literature on the SCCT and the core theoretical constructs that form an integrative SCCT model of mechanical trade persistence is provided. The operationalisation of each theoretical SCCT construct is proposed, through integration of the SCCT literature with broader psychological literature and relevant vocational studies within the STEM trade context.

Chapter Three outlines the methodology of the current research project, providing an analysis of the principles that underpin the research strategy used to adapt and explore an integrative SCCT model of mechanical trade persistence. The paradigmatic positioning of the project is presented through the philosophical position of postpositivism. The epistemological and ontological boundaries of the research are also presented. Axiological positioning within the research project is explained via the vocational psychology of agriculture (VPA) and the psychology of working (POW) framework. A researcher-as-instrument statement is included, disclosing prior knowledge, experiences, and attitudes in relation to conducting vocational research within the context of mechanical trade careers in Australian agriculture. The sequential mixed-method research design is then presented, demonstrating how the SCCT is best placed to address the research questions and inform understanding of attraction and retention of mechanical trade careers in Australian agriculture.

Chapter Four reports on the methods and results of Study One, which consists of a thematic analysis of semi-structured interviews with mechanical tradespeople who work in Australian agriculture. The analysis investigates each of the theoretical factors and

operationalised constructs of an integrative SCCT model of mechanical trade persistence, using the coded data themes to better understand the constructs in the mechanical trade context. The data is then used to inspect the operationalised SCCT constructs against proposed measures of these constructs to be utilised in Study Two. The findings of Study One then inform the development of a new measure of mechanical trade self-efficacy, and the selection and adaptation of existing measures to operationalise the specified theoretical model.

Chapter Five presents a hypothesised integrative SCCT model of mechanical trade persistence and corresponding hypotheses to be tested in relation to the core variables. The methods and results of Study Two are also presented. In particular, the measurement properties of the survey measures are discussed, with attention to the new mechanical trade self-efficacy measure. The four core SCCT outcome variables of job satisfaction, occupational satisfaction, job withdrawal intentions, and occupational withdrawal intentions are examined utilising hierarchical multiple regression analysis. Overall model-fit for the proposed integrative SCCT model of mechanical trade persistence is further investigated through path and mediation analysis.

Chapter Six, the final chapter of the thesis, integrates and discusses the results from Study One and Study Two in relation to the research aims, hypotheses, and core outcome variables. While the results are unable to support the role of self-efficacy in predicting satisfaction and persistence intentions of mechanical trade workers, goal-directed work effort is found to mediate the effect of ability-based outcome expectations on satisfaction. Satisfaction remains a key predictor of persistence intentions within the mechanical trade context. With consideration for these main findings, Chapter Six provides discussion in relation to the theoretical, practical, and methodological implications of the findings, alongside limitations and directions for future research.

CHAPTER TWO: LITERATURE REVIEW

Australian Agriculture

Agriculture is integral to the history of Australian society and the development of the nation's identity (Cockfield & Courtenay Botterill, 2012; Commonwealth of Australia, 2015; Worsley et al., 2015). The Australian people associate agrarian values with national character (Berry et al., 2016; Commonwealth of Australia, 2015) and attribute desirable values such as self-sufficiency, resilience, and community commitment to rural people (Cockfield & Courtenay Botterill, 2012). Valuing farmers, agricultural activity, and the land; continues to be associated with Australia's social, cultural, and political environments (Berry et al., 2016; Commonwealth of Australia, 2015; Daly et al., 2015). Despite facing significant challenges such as drought, Australian agriculture has historically demonstrated characteristic resilience, adaptability, and innovation (Daly et al., 2015); and has continued to be understood as a vital contributor to Australia's social, economic, and environmental sustainability (Commonwealth of Australia, 2015).

Increased demand for agricultural products, in the context of alleviating hunger and malnutrition highlight the global need to develop the sustainability and productivity of the agricultural sector (Food and Agriculture Organization, 2020; OECD/FAO, 2019; United Nations, 2020). The agricultural industry has the capacity to provide for global food security and build the economic resilience (OECD/FAO, 2019) while contributing to efforts to meet the United Nations Sustainable Development Goals of zero hunger, decent work, and economic growth (United Nations, 2020).

Production Demands

Globally, the agricultural sector faces increased demand for food and fibre production (Australian Government Research Council, 2014; National Farmers' Federation, 2012; Spence, 2016) due to global population growth (Australian Government Research Council,

2014; Daly et al., 2015; National Farmers' Federation, 2012; National Farmers' Federation and Sefton & Associates, 2013). Increased demand for food and fibre production in the context of reducing demand on global land and water resources, places additional production demands on the agricultural sector (Australian Government Research Council, 2014; National Farmers' Federation, 2012; Spence, 2016). Climate change impacts (Commonwealth of Australia, 2015; Daly et al., 2015; National Farmers' Federation and Sefton & Associates, 2013) and environmental sustainability (Australian Government Research Council, 2014; Worsley et al., 2015) will have major impacts upon the ability of the agricultural industry to meet global production needs.

Consumer Preferences

In addition, the agricultural sector faces challenges with changing food markets, including changing consumer preferences and increasing food quality demands (Commonwealth of Australia, 2015; National Farmers' Federation, 2012). There is increased wealth in the world today, with an emerging middle class population increasing food consumption (Commonwealth of Australia, 2015; Daly et al., 2015); whilst also placing demands for ethics, sustainability or health attributes (Commonwealth of Australia, 2015; Daly et al., 2015; National Farmers' Federation, 2012; Worsley et al., 2015).

Changes in eating habits and dietary preferences towards increased demand for animal-based, rather than plant-based protein, has also placed a comparative increased demand on the resources of the agricultural sector (Australian Government Research Council, 2014; National Farmers' Federation and Sefton & Associates, 2013). Whilst addressing these challenges, the Australian agricultural industry is also competing in international markets (Worsley et al., 2015), where consumers are driving opportunities for Australia to focus on high-value, specialised products (Daly et al., 2015).

Technological Advancement

Advances in food and fibre production have been driven and challenged by ever changing technology (Commonwealth of Australia, 2015; National Farmers' Federation, 2012; Pratley, 2012, February). Technological advances impact upon labour and production, and the ability to meet food and fibre, as well as food security needs of the growing population (National Farmers' Federation, 2012; National Farmers' Federation and Sefton & Associates, 2013; Pratley, 2012, February).

Future work within the agricultural industry will use knowledge-intensive systems that draw upon technological development, in computing, science, engineering, and data analysis; placing the agricultural industry in competition with other industries for these skills (Daly et al., 2015). Accelerated technological advancement and automation of work has become known as the fourth industrial revolution (Hirschi, 2018). Hirschi (2018) indicated however, that vocational psychology and career research literature has not kept up to date with addressing these challenges.

Economics

There is a dynamic, yet strong sustaining economic relationship between the agricultural sector and Australian regional community economies, providing a level of co-dependence in terms of contribution to economic sustainability in Australia (Pritchard et al., 2012). The economic impact of labour problems in regional areas has been found to reduce regional business activities; as well as to negatively impact core community services, including health and education (Cameron, 2011).

While the development of the agricultural sector is seen as central for Australia's capacity for economic growth, regional Australia is considered to lack the necessary labour force for achieving this growth and developing to its' full capacity (National Farmers' Federation, 2011). The Australian agricultural industry competes against industries such as

mining and manufacturing to meet workforce demands, yet consistently demonstrates economic persistence and capacity to deal with supply and demand associated with product markets, as well as the impact of the mining industry, even during the latest mining boom, due to continual innovation, research and development (Anderson, 2018).

Improvements in productivity within the agricultural sector are considered to have flow-on effects for regional communities, including generational social change (Daly et al., 2015). Businesses within the agricultural sector are considered significant employers in regional Australian communities (Commonwealth of Australia, 2015; Pritchard et al., 2012), contributing positively to regional employment, infrastructure and community well-being (National Farmers' Federation and Sefton & Associates, 2013).

Urbanisation/Depopulation

While Australians value agriculture, increasing urbanisation, and declining regional and rural populations have disconnected people with the agricultural industry (Australian Government Research Council, 2014; Commonwealth of Australia, 2015; Daly et al., 2015). This disconnection threatens the social contract of the agricultural sector in regional communities, which depend on the industry for economic stability and well-being (Worsley et al., 2015).

Worsley et al. (2015) questioned whether Australians appreciate the role of agriculture in food and fibre production; and whether they understand the extent to which agriculture contributes to the economy and regions. De-population within regional areas is of specific concern in relation to regional labour challenges (Daly et al., 2015). In particular, out-migration of young people and demand for workers in the mining industry has exacerbated skill shortages in regional and rural areas for many trades occupations (Cameron, 2011).

In particular, young people are considered to be migrating out of regional areas, due to limits in service accessibility and access to vital infrastructure (National Agribusiness Education Skills and Labour Taskforce, 2014; National Farmers' Federation and Sefton & Associates, 2013). This outmigration has been related to environmental and technological changes, including improvements in productivity and innovation in employment; as well as lifestyle choices of workers and their families (Productivity Commission, 2017).

In addition to concern in relation to long-term trends of depopulation in regional areas (Pritchard et al., 2012), increased urbanisation in Australia is also considered a key factor impacting the needs of regional populations (National Farmers' Federation, 2011; National Farmers' Federation and Sefton & Associates, 2013; Productivity Commission, 2017). Skilled migration and foreign labour have become key elements in Australia's strategy to address major human capital issues; in response to regional labour and skill shortages (Cameron, 2011; Daly et al., 2015)

Infrastructure

Labour force attraction and retention factors are considered to underpin labour shortages in regional Australia (National Agribusiness Education Skills and Labour Taskforce, 2014; National Farmers' Federation and Sefton & Associates, 2013) and are consistently considered to be related to regional populations, poor accessibility and limited access to transport, medical services, education, accommodation, information technology and telecommunication services (Daly et al., 2015; National Agribusiness Education Skills and Labour Taskforce, 2014; National Farmers' Federation and Sefton & Associates, 2013).

Regional labour shortages can be addressed in connection with community factors, such as improving local services and infrastructure; as well as by improving the attractiveness of living and working in regional Australia (Rural Skills Australia, 2015). Communities who aim to attract, involve and retain skilled newcomers; have been encouraged to be proactive in

developing and managing resources, demonstrating capacity for innovation, embracing diversity, and demonstrating an environment of community confidence and sustainability (Rural Skills Australia, 2015). Associated poorer perceptions of regional infrastructure and lifestyles in turn, have been associated with difficulties attracting and retaining skilled workers and professionals as well as a reduced sense of community well-being (Cameron, 2011).

Workforce Priorities

Improving Productivity and Competitiveness

Concerns regarding economic sustainability and stability (Daly et al., 2015; Worsley et al., 2015), as well as prolonged periods of poor growth within the agricultural sector have compounded with general labour force issues experienced in regional Australia (National Farmers' Federation and Sefton & Associates, 2013). There is a need to increase the competitiveness of the Australian agricultural industry (National Agribusiness Education Skills and Labour Taskforce, 2014) and its capacity to address global industry challenges (National Agribusiness Education Skills and Labour Taskforce, 2014; National Farmers' Federation, 2012) through increased production (National Farmers' Federation, 2012; Nelson, 2011).

Strategic efforts to improve the productivity and competitiveness of the agricultural sector in regional economies, have been determined to positively influence economics of both the industry and regional labour markets (Cazcarro et al., 2016; Daly et al., 2015), as well as within associated sectors in the wider production chain (Cazcarro et al., 2016). Labour force issues within the agricultural industry must be addressed to support the sector to meet global challenges and ensure that it continues to drive Australia's economy (Daly et al., 2015; National Agribusiness Education Skills and Labour Taskforce, 2014) as well as to meet the future labour, skills, and education needs of the industry (Commonwealth of Australia, 2015;

National Agribusiness Education Skills and Labour Taskforce, 2014; National Farmers' Federation and Sefton & Associates, 2013; Nelson, 2011).

Embracing Change

Some roles within the agricultural industry are expected to require significantly less employees in the future due to increased productivity, innovation and technological efficiencies (Daly et al., 2015; National Agribusiness Education Skills and Labour Taskforce, 2014). This includes the use of robots and machinery to harvest and prune crops; and drones to survey crops and infrastructure (Daly et al., 2015). While automation will reduce some labour intensive roles within the industry, there will be a greater demand for new skills in response to the changing career opportunities within the sector (Daly et al., 2015).

Other roles are predicted to experience significant growth in response to the changing markets for food and fibre, such as those related to animal based protein-rich foods for the Asian market (National Agribusiness Education Skills and Labour Taskforce, 2014). In this context, modern agriculture needs to be seen as drawing on contemporary skills (Nelson, 2011; Rural Skills Australia, 2015) and having the ability to provide significant career opportunities in the interest of the Australian economy, as well as food and fibre security (Daly et al., 2015; Nelson, 2011).

Attraction of an innovative agricultural workforce is of particular importance to meeting global challenges (Spence, 2016). The agricultural industry needs to attract a highly skilled and diverse workforce that drives innovation and growth, addressing food and fibre production demands (Commonwealth of Australia, 2015; Spence, 2016) while utilising technological advancements to address changing markets (Commonwealth of Australia, 2015).

Repositioning Perception

To increase workforce participation of skilled vital infrastructure workers, the agricultural sector must be repositioned as a competitive industry of long-term choice for new entrants and as an employer of choice (Daly et al., 2015; National Agribusiness Education Skills and Labour Taskforce, 2014; National Farmers' Federation and Sefton & Associates, 2013; Nelson, 2011; Rural Skills Australia, 2015). Poor or outdated perceptions of agriculture as a career choice are considered a significant barrier to attraction and retention of skilled workers in the industry (Commonwealth of Australia, 2015; National Agribusiness Education Skills and Labour Taskforce, 2014; National Farmers' Federation and Sefton & Associates, 2013; Nelson, 2011; Pratley & Hay, 2010; Rural Skills Australia, 2015).

Lack of understanding or negative perceptions of the nature of agricultural careers has been associated with low uptake of careers in the industry (National Agribusiness Education Skills and Labour Taskforce, 2014; National Farmers' Federation and Sefton & Associates, 2013; Pratley & Hay, 2010; Rural Skills Australia, 2015; Worsley et al., 2015). Jobs in agriculture should be promoted as rewarding and challenging as other industries (National Agribusiness Education Skills and Labour Taskforce, 2014; Pratley, 2012, February), particularly to Australia's young urban population (Daly et al., 2015; Rural Skills Australia, 2015).

The strong and resilient reputation of the agricultural sector should also be raised to attract talent and specialised skill sets to the industry; through image repositioning, career promotion, and the development of skilled agricultural career paths (Daly et al., 2015; Nelson, 2011; Pratley, 2012, February). Current students should be encouraged to develop interest in meeting challenges in food and fibre production related to a growing population and changing climate/resource availability (Spence, 2016).

The agricultural sector has been implicated in failing to promote career pathways, as well as associated low level of industry involvement in education and training (Commonwealth of Australia, 2015; National Agribusiness Education Skills and Labour Taskforce, 2014; National Farmers' Federation and Sefton & Associates, 2013; Pratley & Hay, 2010). Industry groups have been encouraged to promote study and careers in science and agriculture in order to address this (National Farmers' Federation and Sefton & Associates, 2013).

The agricultural sector has been tasked with educating the Australian people about their role in food and fibre production, issues being faced, and significant achievements (National Farmers' Federation and Sefton & Associates, 2013; Worsley et al., 2015). This knowledge also needs to be accommodated into primary, secondary, and tertiary education sectors to build positive sentiment in relation to agriculture in the population (National Farmers' Federation and Sefton & Associates, 2013; Worsley et al., 2015).

As the vast majority of the agricultural sector is located in regional Australia, strategies for attracting and retaining vital agricultural workers must also address social perceptions about living in regions, such as negative perceptions about regional lifestyles and career opportunities (National Farmers' Federation and Sefton & Associates, 2013). While regional living presents concerns for some regarding adequate access to health services, education facilities, and housing; promotion of regional lifestyle could attract more skilled workers to regional living (National Farmers' Federation and Sefton & Associates, 2013) (Nelson, 2011).

Social Cognitive Career Theory

The social cognitive career theory (SCCT) was developed to complement and unite common elements of established career development theories, providing a framework for directing research hypotheses (Lent & Brown, 2006b, 2019; Lent et al., 1994). The SCCT

consists of five interrelated models of career and academic interest, choice, performance, satisfaction, and self-management (Brown & Lent, 2019; Lent & Brown, 2019). The core social cognitive variables of self-efficacy, outcome expectations, and goals operate with person, contextual, and behavioural variables to predict career behaviour (Brown & Lent, 2016, 2019; Lent & Brown, 2008, 2013, 2019; Lent et al., 1994, 2000; Lent, Ezeofor, et al., 2016; Lent et al., 2013; Sheu & Bordon, 2017).

The SCCT adopts Bandura's general social cognitive theory (Brown & Lent, 2019; Lent et al., 1994, 2000; Lent et al., 2013) and triadic reciprocal causation framework (Lent & Brown, 2019) to focus on contextual, person and behavioural factors that influence educational and career-related behaviour (Lent & Brown, 2019; Lent et al., 1994, 2000). The SCCT adds behaviour to the person-environment model as a factor, rather than an outcome; positing a dynamic interaction between changing individuals and their contexts (Lent et al., 1994).

The SCCT states that people exercise personal agency in the career development process, and that extra-personal factors enhance or constrain personal agency — relating people, their behaviour, and their environments as mutually influential (Lent et al., 1994, 2000). The SCCT places emphasis on situation and domain-specific behaviour, dynamic aspects of individual's sense of self, and the mechanisms of which individuals exercise personal agency — encouraging research into previously understudied career areas (Lent & Brown, 2019; Lent et al., 1994).

The core SCCT models theorise the relationships between environmental, affective, and socio-cognitive variables to understand vocational behaviour and adjustment (Lent & Brown, 2013, 2019; Lent et al., 2008; Sheu & Bordon, 2017). The SCCT models focus on the interplay between person, environment and behaviour variables; as they relate to ongoing processes through which people develop, make and revise occupational choices, and achieve

performance within occupational domains (Lent et al., 2013; Sheu & Bordon, 2017; Sheu et al., 2010).

The SCCT initially consisted of three interconnected models focusing on interest development, choice-making, and performance and persistence in educational and vocational domains (Lent & Brown, 2019; Lent et al., 1994). Further theoretical additions focused on satisfaction and career-self management (Brown & Lent, 2019; Lent & Brown, 2019). The SCCT hypothesises socio-cognitive determinants of career and academic interest, which promote career-related activity involvement and skill development (Lent et al., 1994; Lent et al., 2013).

During childhood and adolescence, people are directly or vicariously exposed to career relevant learning experiences and perceived performance observations within their home, education and community environments (Lent & Brown, 2019; Lent et al., 1994). These experiences form a sense of task-specific self-efficacy and people develop expectations about the outcomes of their performance (Lent & Brown, 2019; Lent et al., 1994). Interest, domain-specific self-efficacy, and outcome expectations are linked to individual goals and domain-specific satisfaction; all of which affect future career behaviour (Lent et al., 1994, 2000). The original interest, choice, and performance models have been the subject of meta-analytical review, with findings across the core models generally consistent with the hypothesized relations among the variables across behavioural domains (Lent et al., 2019; Lent et al., 2018).

The empirical status of the core SCCT models has been well supported in theoretical literature (Brown & Lent, 2019; Lent & Brown, 2019) and meta-analysis (Brown et al., 2008; Lent et al., 2018; Sheu & Bordon, 2017; Sheu et al., 2010). Performance models were the subject of meta-analytic review in 2008, with outcomes of adequate to excellent modelling of academic performance and persistence (Brown et al., 2008). Further meta-analytic review of

performance and persistence models supported a modified version of the model that also provided adequate fit to the data (Brown et al., 2011).

In addition to the meta-analytical findings regarding the SCCT core models, Lent et al. (2013) reported similar outcomes when integrating the SCCT models to predict persistence intentions. Integrative modelling utilises the core SCCT variables of self-efficacy, outcome expectations, contextual supports, personality traits, interests, and job satisfaction to predict persistence intentions; and has been theoretically supported within the academic domain of engineering (Lent, Miller, et al., 2016; Lent et al., 2013; Navarro et al., 2014).

Agriculture

The few studies in relation to agricultural careers that utilise SCCT as a framework focus on understanding career choice (Turner & Hawkins, 2014; Yanan, 2015), career exploration, and job satisfaction (Ding, 2015; McDonald, 2017). Two Australian studies have qualitatively drawn upon the SCCT to explore the career motivations of undergraduate agricultural science students, particularly in relation to attraction to agricultural jobs (Turner & Hawkins, 2014; Yanan, 2015).

Turner and Hawkins (2014) investigated university students in Tasmania, confirming that initial expected outcomes for careers in agriculture were largely negative or non-existent in this population, including misperceptions about low level skill requirements and limited career paths in the industry beyond farming (Turner & Hawkins, 2014). To counter these findings and positively impact the choice to pursue an agricultural career path, Turner and Hawkins (2014) developed interventions to revise negative expected outcomes of careers in agriculture and address barriers related to negative learning experiences to.

Yanan (2015) quantitatively investigated New Zealand agricultural students' expectations and perceptions of white-collar farm management careers, exploring personal and contextual factors that influence job choice intentions, across the individual, proximal,

and societal context. Yanan (2015) found that students' expectations and perceptions, as well as personal and contextual factors were influential in determining job choice. Two additional studies have demonstrated rigorous testing of SCCT variables, adapting constructs to career choice exploration and job satisfaction (Ding, 2015; McDonald, 2017). Ding (2015) conceptualised a choice model to focus on goals and career exploratory behaviour of African American agricultural science students.

In line with the current stream of research regarding the VPA, McDonald (2017) utilised a mixed-methods SCCT approach to investigate job satisfaction in a sample of Australian farm workers, further proposing a social cognitive model of agricultural career interest development (McIlveen & McDonald, 2019) as indicated in Figure 1. Both studies indicated that the respective structural models were indicated to have good fit overall in the populations, supporting the generalisability of both the choice and job satisfaction models of SCCT to the agricultural industry (Ding, 2015; McDonald, 2017).

Persistence

Within the SCCT, persistence is conceptualised as a reflection of choice actions and choice stability (Lent et al., 2003; Lent et al., 2013). Brown et al. (2008) combined meta-analytic and structural equation modelling methodologies to analyse and consequently support modelling of the social cognitive predictors of academic persistence. The integrative SCCT model of persistence proposed by Lent et al. (2013) has been the focus of both cross-sectional and longitudinal research with engineering students.

Examination of the adequacy of the integrative SCCT model of interest, satisfaction, and choice stability (see Figure 2) with engineering students in academic settings has, regardless of the type of study undertaken, generally supported the utility of the model (Lee et al., 2015; Lent, Miller, et al., 2016; Lent et al., 2013; Navarro et al., 2014; Navarro et al., 2019). Lent et al. (2013) offered support for the relations among the factors, theorising that

intended choice persistence was expected to be predicted by self-efficacy, outcome expectations, and environmental support, in additional to interest and satisfaction (Lent et al., 2013).

Lee et al. (2015) and Navarro et al. (2014) utilised longitudinal perspectives to test the integrative model within the academic domain of engineering, supporting the significant relations in the original model. Navarro et al. (2014) reported findings that supported a reciprocal relationship between satisfaction and intended persistence. Lee et al. (2015) reported that the integrative academic persistence model provided excellent fit to the data; indicating that most of the hypothesised relations among the variables were significant, additionally supporting the relations between self-efficacy, goals, and persistence.

Lent, Miller, et al. (2016) also conducted a longitudinal study to predict academic persistence. The results of their path analysis indicated satisfaction, self-efficacy and social support produced direct paths to persistence. Further research by Navarro et al. (2019) has continued to suggest that the hypothesised integrative SCCT model of persistence fits the data well, also suggesting that self-efficacy plays a core role in promoting academic satisfaction and persistence. These findings suggest that an integrative SCCT model can offer an explanation for the processes through which students become attracted to and persist with STEM fields (Lent, Miller, et al., 2016; Lent et al., 2013; Navarro et al., 2014). (Lent et al., 2013).

Theorising an Integrative SCCT Model of Mechanical Trade Persistence

Despite emerging support for the generalisability of SCCT to career behaviours within the agricultural industry, empirical research in relation to the application of the SCCT to problems associated with the career motivations of mechanical trade STEM workers is lacking. The VET sector plays an integral role in career entry of tradespeople; yet careers trained via this pathway have been overlooked in comparison to focus on university trained

career outcomes (Halliday-Wynes et al., 2008; Loveder, 2017). The SCCT integrative model of persistence (Lent, Miller, et al., 2016; Lent et al., 2013) requires further investigation within the domain of mechanical trade careers to develop a greater understanding of the social cognitive factors that influence this career pathway.

The SCCT constructs that relate to modelling of satisfaction and persistence will be investigated through conceptualisation and measurement of an integrative SCCT model of mechanical trade persistence in accordance with the VPA (McIlveen, 2015; McIlveen & McDonald, 2019). Mechanical trade domain-specific operationalisation of constructs within the integrative SCCT model will be informed by Lent and Brown's (2006b) measurement guidelines for conceptualising and assessing social cognitive constructs in career research.

Additional literature relating to trades and blue-collar careers may contain noteworthy findings that assist with domain specificity beyond that offered by the SCCT research. The relevance of this evidence will be discussed and integrated into the review of the literature for each SCCT variable within the measurement model where available. From the literature, preliminary arguments will be made to operationalise an integrative SCCT model of mechanical trade persistence, to assist with adapting this information to the agricultural context. The SCCT predictor constructs will include satisfaction, contextual barriers and supports, mechanical trade self-efficacy, sources of realistic self-efficacy, outcome expectations, personality and affective states, and realistic interests.

Satisfaction

Satisfaction sits at the outcome end of the Integrative SCCT Model of Persistence (See Figure 3) and is theorised to directly predict persistence intentions. Within the SCCT, satisfaction is conceptualised as the extent to which individuals enjoy or have a positive emotional status in relation to their global academic and vocational work domains (Lent & Brown, 2006a; Lent et al., 2013; Singley et al., 2010). Satisfaction is a determinant of

intended persistence (Lent, Miller, et al., 2016; Lent et al., 2007) and is considered a domain-specific aspect of individual psychological well-being that allows connection between the psychology of working (POW) framework and the SCCT (Blustein, 2008; Kim et al., 2018; Lent & Brown, 2008).

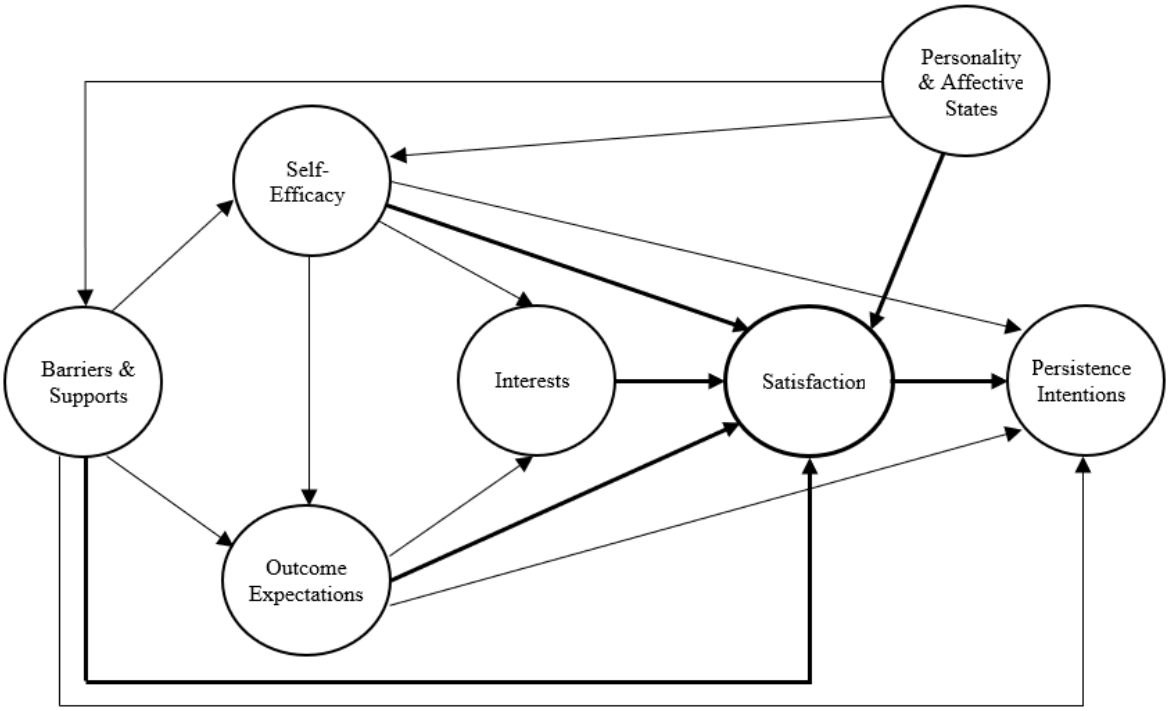
The social cognitive approach acknowledges that satisfaction has multiple sources (Lent & Brown, 2008), with satisfaction theorised to be predicted by self-efficacy, outcome expectations, interests, environmental supports, and personality traits and affective dispositions (Lent et al., 2013; Lent et al., 2007; Navarro et al., 2019; Singley et al., 2010). Job satisfaction has been studied extensively as an important outcome in vocational psychology and with research increasingly extending upon causal research to consequences of job satisfaction in relation to career persistence intentions (Fouad et al., 2017; Fouad et al., 2016).

Lent and Brown (2006a; 2008) use the terms job and work satisfaction interchangeably. The perceived fit between needs and values, and the reinforcers provided by work is strongly associated with job satisfaction (Lent & Brown, 2006a; Lent et al., 2007). Theory-consistent assessment guidelines utilising the social-cognitive perspective, specify that predictor variables be tailored to dependent variables, as with other variables in the model (Lent & Brown, 2006a).

Within the context of current research in relation to mechanical trade career persistence, these guidelines would suggest a need to investigate satisfaction at both the job and the occupation level of specificity. It is argued that satisfaction will be operationalised as job satisfaction and occupational satisfaction for an integrative SCCT model of mechanical trade persistence.

Figure 3

Integrative SCCT Model of Persistence Highlighting Direct Paths to and from Satisfaction



Note. The bold paths represent the theorised relationships between satisfaction and the other SCCT variables within the model. These highlighted paths will guide hypotheses testing. Adapted from "Social cognitive predictors of adjustment to engineering majors across gender and race/ethnicity" by R. W. Lent, et al. 2013, *Journal of Vocational Behavior*, 83(1), p. 23.

Contextual Barriers and Supports

Contextual barriers and supports are positioned on the outside of the Integrative SCCT Model of Persistence (See Figure 4). Barriers and supports are theorised to directly predict self-efficacy, outcome expectations, satisfaction, and persistence intentions. Contextual, or environmental career relevant barriers and supports include those that exist, or are perceived to exist in the environment surrounding the individual (Lent & Brown, 2006b; Lent et al., 2001; Lent et al., 2000).

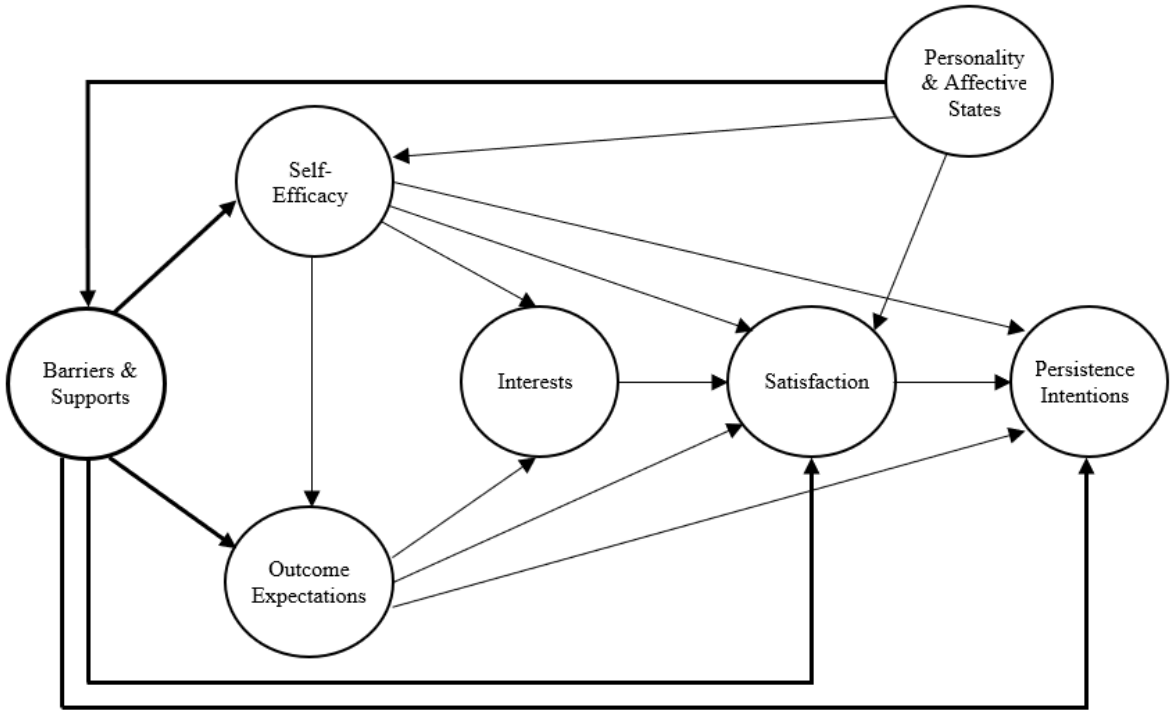
The SCCT research approach often involves focus on types of environmental barriers and supports that relate specifically to the domain under study (Lent & Brown, 2006b). Contextual barriers and supports are environmental factors that may facilitate or impede career development (Lent et al., 2001; Lent et al., 2000) and are theorised to relate to vocational outcomes through self-efficacy and outcome expectations (Brown & Lent, 2019; Sheu et al., 2010).

In the SCCT, contextual barriers generally refers to negative contextual influences upon career progress, whereas contextual supports generally refers to facilitative contextual influences (Lent et al., 2000). Both contextual barriers and supports are domain and context specific, and any investigation needs to correspond appropriately with outcome criteria content and timeframe (Lent et al., 2000).

Brown et al. (2018) utilised the SCCT operationalisation of contextual barriers and supports in a meta-analytic study investigating the role of environmental supports and barriers in educational and career development. Brown et al. (2018) provided empirical support for the importance of supports to career success and development, despite the experience of concurrent barriers; with supports reported to be a superior predictor of vocational outcomes compared to barriers.

Figure 4

Integrative SCCT Model of Persistence Highlighting Direct Paths to and from Contextual Barriers and Supports



Note. The bold paths represent the theorised relationships between contextual barriers and supports and the other SCCT variables within the model. These highlighted paths will guide hypotheses testing. Adapted from "Social cognitive predictors of adjustment to engineering majors across gender and race/ethnicity" by R. W. Lent, et al. 2013, *Journal of Vocational Behavior*, 83(1), p. 23.

As such, while Study One will investigate and operationalise both contextual barriers and supports within the mechanical trade domain. For brevity, Study Two will only capture contextual supports. It is argued that contextual barriers and supports will be operationalised as perceived organisational support for an integrative SCCT model of mechanical trade persistence.

Mechanical Trade Self-Efficacy

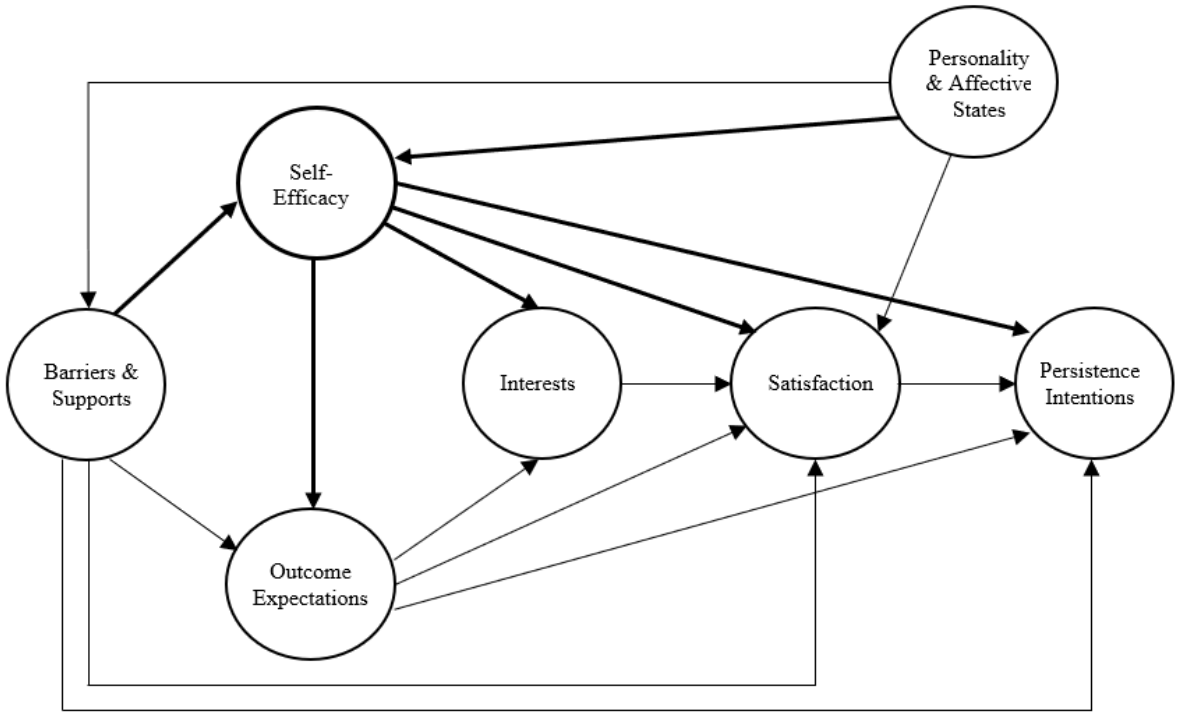
Self-Efficacy is a core construct of the SCCT (See Figure 5). Self-efficacy is theorised to directly predict outcome expectations, interest, satisfaction, and persistence intentions. Self-Efficacy beliefs are considered a core social cognitive construct and the central mechanism of personal agency within the SCCT (Brown & Lent, 2017, 2019; Lent & Brown, 2006b; Lent et al., 1994; Sheu et al., 2010).

Within the SCCT, self-efficacy is considered a dynamic set of central determining beliefs that are specific to particular performance domains; interacting with person, behaviour, and contextual factors (Lent & Brown, 2006a, 2006b; Lent et al., 1994). Conceptualisation of self-efficacy within SCCT is based on Bandura's (1986, p. 39) definition whereby, self-efficacy refers to "people's judgements of their capabilities to organise and execute courses of action required to attain designated types of performances."

Self-efficacy does not relate to objectively assessed capacity; rather, self-efficacy beliefs refer to a workers' confidence in their ability to meet the requirements of domain specific work-related tasks under normative conditions (Brown & Lent, 2019; Brown et al., 2011; Lent & Brown, 2006b; Lent et al., 1994). As such, self-efficacy answers domain specific questions of "can I do this?" task or set of tasks (Lent & Brown, 2006b; Lent et al., 1994).

Figure 5

Integrative SCCT Model of Persistence Highlighting Direct Paths to and from Self-Efficacy



Note. The bold paths represent the theorised relationships between self-efficacy and the other SCCT variables within the model. These highlighted paths will guide hypotheses testing. Adapted from "Social cognitive predictors of adjustment to engineering majors across gender and race/ethnicity" by R. W. Lent, et al. 2013, *Journal of Vocational Behavior*, 83(1), p. 23.

Self-efficacy is considered a primary changeable determinant of career performance activity and environmental choice; linked to interests, outcome expectations, personal goal-directed activity, satisfaction, and persistence (Brown & Lent, 2016, 2019; Lent & Brown, 2019; Lent et al., 1994; Sheu & Bordon, 2017). When testing an integrative model of engineering academic engagement, satisfaction and persistence Navarro et al. (2019) found engineering self-efficacy played a central role in promoting engineering academic satisfaction and persistence.

While additional meta-analytic research related to SCCT and STEM career choice supported these hypotheses, Lent et al. (2018) did suggest that the role of self-efficacy was more prominent in promoting domain specific outcome expectations and interest, than the direct link between self-efficacy and career goals. Additionally, McDonald (2017) found within the context of on-farm agricultural workers, self-efficacy did not directly predict job satisfaction nor goal-directed activity, rather, indirectly predicted work engagement through work volition.

Taking the theoretical information in relation to self-efficacy into account, self-efficacy is most commonly conceptualised and measured in relation to task-specific self-efficacy (Lent & Brown, 2006b). This refers to belief's in a person's ability to perform the specific tasks of their job or occupation (Lent & Brown, 2006b). In the relation to the domain of mechanical trade careers, the specific nature of mechanical trade tasks was initially explored through the O*Net Online database (National Center for O*NET Development, 2020); which contains standardised, occupation-specific descriptors of occupations, including task-based information.

The O*Net Online database indicates that across a range of industries, mechanical tradespeople complete tasks such as: inspecting mechanical systems; using hand and power tools; operating machinery; repairing and maintaining mechanical equipment; adjusting and

reassembling equipment; repairing, rebuilding, replacing or installing mechanical components; diagnosing mechanical faults; obtaining and evaluating job information; inspecting machinery; documenting information; and working on hydraulic, electrical and electronic systems (National Center for O*NET Development, 2020). For the present research, these tasks will form the basis of the operationalisation of mechanical trade self-efficacy for an integrative SCCT model of mechanical trade persistence. The new, domain-specific measure of mechanical trade self-efficacy will be developed utilising the results of Study One, to inform qualitative measurement of construct in Study Two.

Sources of Realistic Self-Efficacy

Self-efficacy beliefs are considered to be acquired and modified by four primary sources of learning experience, which depend on how individuals attend to and interpret them, including; personal performance accomplishments (e.g., successes and failures), vicarious learning (e.g., observations of others), social persuasion (e.g., social encouragement or discouragement), and physiological or affective states (e.g., positive and negative emotions related to performing particular tasks) (Bandura, 1977, 1986; Byars-Winston et al., 2017; Lent & Brown, 2006b; Lent et al., 2017; Sheu et al., 2018). These four learning experiences are "seen as key mediations of person and contextual influences on academic and career development" (Lent et al., 2019, p. 6).

Observations of others performance on a particular activity, considered vicarious learning, impacts self-efficacy particularly when the person has had little direct experience themselves in which to estimate their performance (Lent & Brown, 2006b; Lent et al., 1994). The effect of personal performance experience on self-efficacy is impacted by the conditions under which the task was performed; as well as the consequence of task performance, including successes and failures (Lent & Brown, 2006b; Lent et al., 1994; Lent et al., 2017). Social persuasion includes both encouragement or discouragement from within the primary

social network the person has access to; including whether the person is exposed to supportive messages in relation to their domain specific capacity (Lent & Brown, 2006b; Lent et al., 2017).

A final source of self-efficacy judgements also relates to the physiological or affective states that the person experiences during task performance. Anxiety or stress states may reduce perceived self-efficacy; whereas affective experience of pride or happiness may facilitate perceived experience of task self-efficacy (Lent & Brown, 2006b; Lent et al., 1994; Lent et al., 2017). In this context, affective disposition is considered a cognitive filter through which self-efficacy beliefs are judged (Lent et al., 1994; Lent et al., 2017).

Billett (2004; 2008) conceptualises workplaces as learning environments, particularly as participation and learning for workers trained in the workplace is central to their career. In this context, human agency plays a central role in the worker's formal and informal learning experience when engaging in the work environment (Billett, 2004, 2008). VET workplaces provide workers, such as mechanical tradespeople with the opportunity to engage their interests through goal-directed activity, to observe and interact with their colleagues, and to subsequently learn and develop through this participatory process (Billett, 2004, 2008).

Schaub and Tokar (2005) developed the Learning Experiences Questionnaire in order to extend upon the SCCT empirical literature, examining the hypothesised association of learning experiences with self-efficacy, using measures that assessed the construct according to associated RIASEC based source experiences. Realistic learning experiences were found to be a strong positive predictor of self-efficacy (Schaub & Tokar, 2005). The operationalisation of Bandura's (1986) four sources of self-efficacy as learning experiences across Holland (Holland, 1997) theme domains by Schaub and Tokar (2005) has been well-supported in the SCCT literature (Garriott, Raque-Bogdan, et al., 2017; Lent et al., 2017; Sheu et al., 2018).

More recently, Garriott, Navarro, et al. (2017) utilised the realistic and investigative Holland domains of the Learning Experience Questionnaire to investigate the relationship between engineering-related learning experiences, self-efficacy, outcome expectations, and persistence intentions in a sample (N = 130) of first-generation college students. These findings reiterate the importance of investigating the sources of self-efficacy of working mechanical tradespeople within the Australian VET domain as realistic learning experiences, to inform the operationalisation of an integrative SCCT model of mechanical trade persistence.

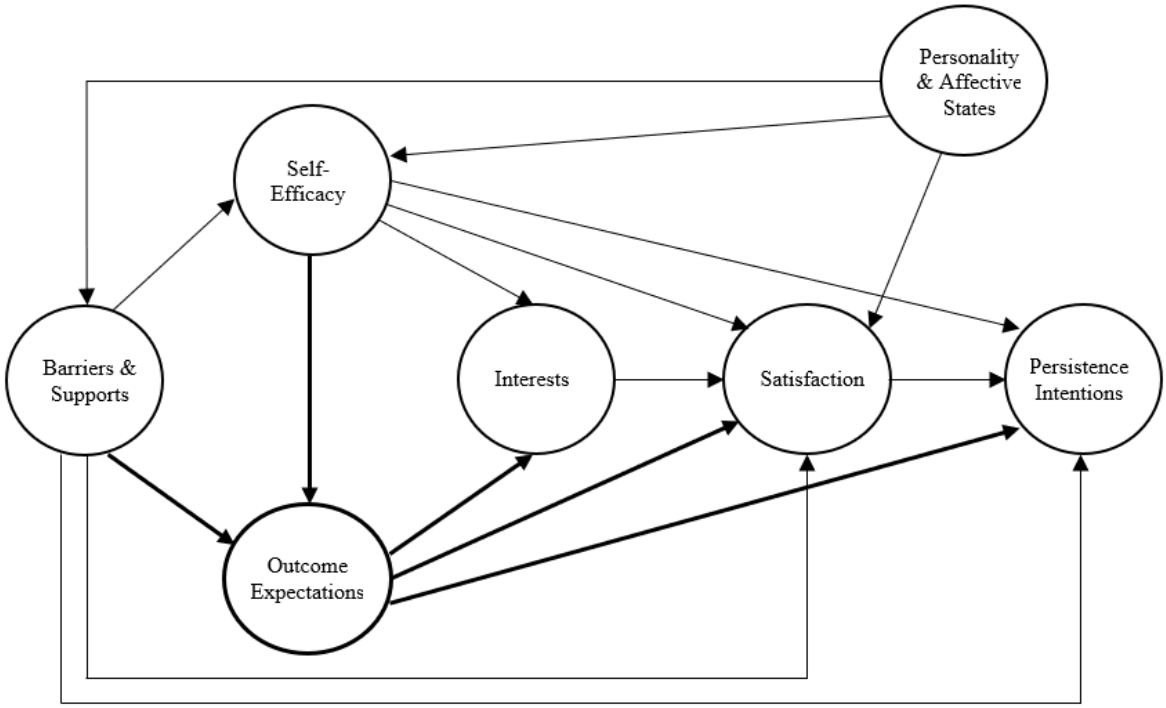
Outcome Expectations

Outcome expectations are a core construct of the SCCT (See Figure 6). Outcome expectations are theorised to directly predict interest, satisfaction, and persistence intentions. Outcome expectations are conceptualised as a person's beliefs about the consequences of performing particular behaviours or courses of action (Brown & Lent, 2019; Lent & Brown, 2006b; Lent et al., 2005; Sheu et al., 2010), when engaging in domain specific work-related tasks (Brown et al., 2011; Fouad et al., 2016; Lent et al., 2000).

Outcome expectations can be evaluated on dimensions of relative importance to the individual (Lent et al., 1994, 2000) and are conceptualised as the beliefs that people hold about the extent to which particular career outcomes satisfy their primary values (Lent & Brown, 2006b; Lent et al., 1994). Primary values have been aligned with traditional categories of work values, such as altruism, compensation, and autonomy (Lent & Brown, 2006b; Lent et al., 1994).

Figure 6

Integrative SCCT Model of Persistence Highlighting Direct Paths to and from Outcome Expectations



Note. The bold paths represent the theorised relationships between outcome expectations and the other SCCT variables within the model. These highlighted paths will guide hypotheses testing. Adapted from "Social cognitive predictors of adjustment to engineering majors across gender and race/ethnicity" by R. W. Lent, et al. 2013, *Journal of Vocational Behavior*, 83(1), p. 23.

Lent and Brown (2006b) theorised outcome expectations with types indicated by Bandura (1986) regarding anticipated social (e.g., family), material (e.g., financial), and self-evaluative (e.g., self-approval) expectations. Fouad and Guillen (2006) support this conceptualisation in relation to Bandura's types, including pleasant and unpleasant physical outcomes, and social reactions including recognition and approval.

The source of outcome expectations are similar to those of self-efficacy, including direct reinforcement from engaging in the activity and vicarious learning from others experiences (Fouad & Guillen, 2006). Specifically, these source learning experiences convey four types of information relevant to outcome expectations, including personal performance accomplishments, observational learning, social encouragement and persuasion, as well as physiological and affective states or reactions (Lent & Brown, 2013; Lent et al., 2017).

While empirical literature supports the general construct validity of career-related outcome expectations, as well as the hypothesised relationships between outcome expectations and other SCCT constructs (Fouad & Guillen, 2006; Lent & Brown, 2019), research in relation to the significance of outcome expectations within the SCCT has proved inconclusive (Lee et al., 2015). While many SCCT studies reported that outcome expectations are a significant predictor of interests, goals, and academic satisfaction (Byars-Winston et al., 2010; Flores et al., 2014; Lent et al., 2005, 2013); others are unable to report a significant relationship between these variables (Lent, Lopez, Sheu, & Lopez, 2011; Lent et al., 2003, 2007).

Sheu and Bordon (2017) reviewed 37 international SCCT research studies focused on the SCCT's interest, choice, performance, and satisfaction models; the majority of which were conducted in the academic domain across STEM majors and RIASEC domains. They were unable to offer consistent support for the hypothesised relationship between outcome expectations to outcomes of interest, choice goals or goal progress, and academic or job

satisfaction. Despite these inconsistencies, both Lent and Brown (2019) and Fouad and Guillen (2006) report that the accumulated data in relation to the SCCT is generally theory-consistent, including assumptions related to outcome expectations.

While many SCCT studies have investigated outcome expectations, varied construct operationalised is considered a primary factor related to inconsistent relational findings (Shoffner et al., 2015). Brown and Lent (2019) agree that differences in findings related to the role of outcome expectations in the SCCT may be attributed to measurement issues regarding the operationalisation of outcome expectations across domains. Navarro et al. (2007) has appropriately highlighted the lack of attention given to outcome expectations in the vocational literature and the need to further explore their operational definitions and their role in the SCCT. While outcome expectations in the SCCT are often conceptualised according to Bandura's categories of physical outcomes (e.g., financial gain or loss, life style, risk and setting), social outcomes (e.g., social status, approval), and self-outcomes (e.g., intrinsic motivation or rewards), they are rarely operationalised in this way (Fouad & Guillen, 2006; Shoffner et al., 2015).

Much of the theoretical research in relation to the interest and choice models of SCCT relates primarily to developmental tasks prior to, during, and just after career entry (Lent et al., 1994). Lent, Paixão, et al. (2010) undertook SCCT choice research with Italian high school students across the Holland (1997) RIASEC types utilising scales for auto mechanic and electrician outcome expectations across the realistic type. They found associations regarding positive outcomes such as independence, creativity, and prestige in relation to the occupational choices in the realistic Holland (1997) domain.

With this in mind, outcome expectations relate to the future, what the person 'will get' and involves the outcomes the person anticipates they will receive after they have attained their work choice goals, in turn relating to expected working conditions and reinforcers (Lent

& Brown, 2006b). Lent et al. (2007) presented concern that interest and choice measures did not adequately represent the most salient outcomes when investigating persistence intentions; subsequently adding a theory of work adjustment operationalisation of work values to the measurement of outcome expectations, with use of scales from the Minnesota Importance Questionnaire in subsequent persistence studies (Lent, Miller, et al., 2016; Lent et al., 2013).

Additional to general findings in relation to the role of outcome expectations within SCCT modelling, additional literature was sourced that related to the career motivations of blue-collar workers that may assist with domain operationalisation of outcome expectations for mechanical trade workers. While investigating how outcome expectations could be operationalised within the mechanical trade context, research regarding the motivating values of blue-collar workers was considered.

Koekemoer et al. (2019) had a qualitative approach to exploring vocational behaviour among blue-collar manufacturing workers; agreeing that this form of work is often perceived as lacking in prestige, value, and rewards. Consistent with the current research, Koekemoer et al. (2019) were motivated by the need to expand vocational psychology to this underrepresented category of workers, aligning with the motivations of the POW framework (Blustein, 2006). Thematic analysis reported the findings related to aspects of the workers lives that they deemed important: support from the organisation, opportunities to develop competence and skills, being able to provide financially, achieving personal standards of high performance, fulfilling a role that provides a sense of purpose and adds meaning, and working in a conducive environment.

Hennequin (2007) also took a qualitative approach to exploring the vocational behaviour of blue-collar workers, utilising a grounded theory approach to data analysis. While Hennequin (2007) operationalised their research around career success, they explored positive work-related outcomes that resulted from work experiences across textile,

automotive, and food industries. Hennequin (2007) found that blue-collar workers perceived financial rewards, recognition for being a capable worker, job successes (such as autonomy and expertise), collegial support, social status, recognition and reputation as positive work-related outcomes associated with their work.

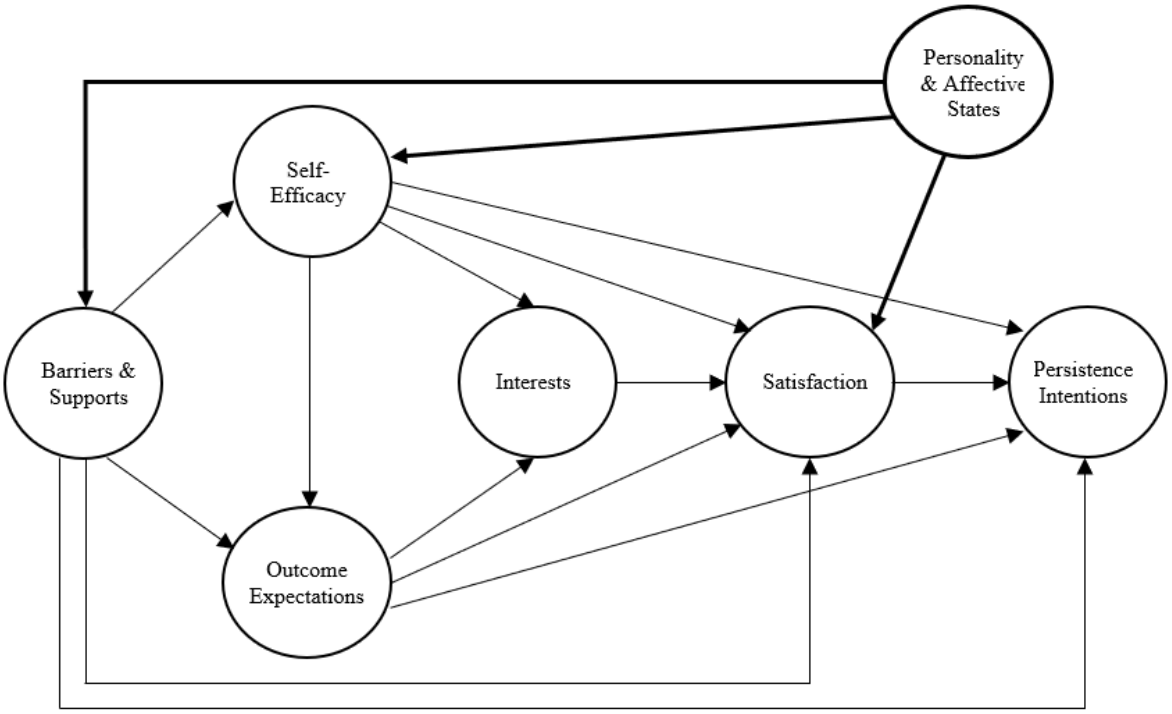
Research in relation to important elements of blue-collar careers that inform satisfaction and persistence needs to incorporate valued outcomes related to the domain, which is consistent with the research presented in relation to the current status of outcome expectation measurement within integrative SCCT models of persistence. It is argued that outcome expectations operationalised via the Minnesota Importance Questionnaire will be investigated in relation to determining a domain-specific operationalisation of outcome expectations within an integrative SCCT model of mechanical trade persistence.

Personality and Affective States

Personality and affective states are positioned on the outside of the Integrative SCCT Model of Persistence (See Figure 7). Personality and affective states are theorised to directly predict barriers and supports, self-efficacy, and satisfaction. With the SCCT, person inputs such as personality and affective states, impact upon career development processes as positive and negative affective dispositions are thought to alter an individual's perception of environmental conditions (Lent & Brown, 2006a; Lent et al., 2000; Schaub & Tokar, 2005). Personality is most often represented within SCCT according to the Big Five personality dimensions, which represent a broad classification of individual differences across traits including: neuroticism, extraversion, openness, agreeableness, and conscientiousness (Larson et al., 2002; Lent & Brown, 2006a; Sheu & Bordon, 2017). Personality traits and affective dispositions are hypothesised to have direct effects on environmental supports and resources, self-efficacy, and interests across different SCCT models (Lent et al., 2013; Navarro et al., 2019).

Figure 7

Integrative SCCT Model of Persistence Highlighting Direct Paths from Personality and Affective States



Note. The bold paths represent the theorised relationships between personality and affective states and the other SCCT variables within the model. These highlighted paths will guide hypotheses testing. Adapted from "Social cognitive predictors of adjustment to engineering majors across gender and race/ethnicity" by R. W. Lent, et al. 2013, *Journal of Vocational Behavior*, 83(1), p. 23.

SCCT research in relation to the role of personality and affective states in predicting satisfaction and persistence intentions has focused on the personality dimension of conscientiousness, as well positive and negative affective states (Brown & Lent, 2019). Brown et al. (2011) reported that both conceptual and empirical considerations in the research led to the focus on the Big Five personality trait of conscientiousness in SCCT research. Conscientiousness is a positively valued occupational trait characterised by persistence and achievement-orientation behaviour related to work performance indices such as job tenure (Brown et al., 2011).

Workers who demonstrate conscientious traits are theorised to be more likely to experience success in their workplace due to their tendency to set themselves challenging goals, to be hard-working, persistent and achievement-oriented (Brown et al., 2011). Conscientious workers are described as achievement-oriented, dependable, and deliberate (Judge et al., 2002). There is ample support to proceed with investigation of the trait of conscientiousness within the mechanical trades context, as conscientiousness has been found to be a strong and consistent predictor of workplace performance (Judge et al., 2002; Judge & Ilies, 2002).

The VPA (McIlveen & McDonald, 2019) also ascertains that in addition to conscientiousness, other personality and affective traits such as grit, may motivate agricultural workers. Grit is a personality trait defined as perseverance and passion for long-term goals (Duckworth et al., 2007). Workers who demonstrate gritty traits are seen to work strenuously towards challenges; and to maintain effort and interest over years despite experiencing failure, adversity, and plateaus (Duckworth & Quinn, 2009); much like workers experience in relation to achieving career success. Grit is highly correlated with, but theorised as a distinct construct of Big Five conscientiousness regarding the duration and intensity of

the behaviour (Duckworth & Quinn, 2009); demonstrating predictive validity over and beyond conscientiousness in measures of vocational success (Duckworth et al., 2007).

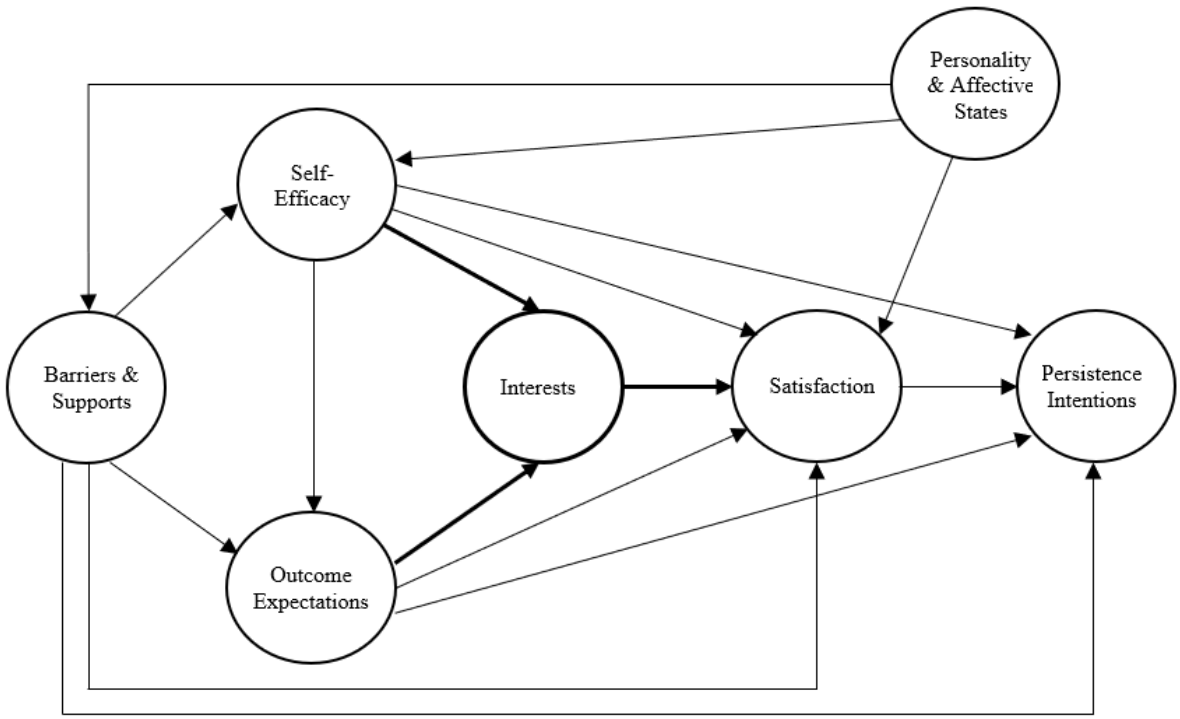
While they did not utilise the SCCT as a theoretical foundation, several studies investigating the relationship between personality and vocational satisfaction were examined. Diedrich et al. (2018) investigated the role of the Big Five personality traits in predicting job-fit and professional success across a sample of apprentice programs. They found that satisfaction was predicted by conscientiousness in a sample of apprentices within technical occupations. Volodina et al. (2018) investigated personality traits and as determinants of VET satisfaction in a sample off apprentices who were predominately technicians. They found that conscientiousness was significantly associated with VET satisfaction. It is then argued that personality and affective States will be operationalised as conscientiousness and grit for an integrative SCCT model of mechanical trade persistence.

Realistic Interests

Interests are a core construct in an Integrative SCCT Model of Persistence (See Figure 8). Interests are theorised to directly predict satisfaction. Vocational interests are defined as the extent to which an individual likes, or dislikes, a particular set of activities or tasks (Lent & Brown, 2006b; Sheu et al., 2010). The SCCT interest model research theorises that during childhood and adolescence, individuals are exposed to activities of potential career interest through either direct experience or observation of others (Lent et al., 1994). This process of interest development is considered fluid until late adolescence, before crystallising in early adulthood (Lent et al., 1994); with interests serving as a primary attractor to STEM majors (Lent et al., 2013).

Figure 8

Integrative SCCT Model of Persistence Highlighting Direct Paths to and from Interests



Note. The bold paths represent the theorised relationships between interests the other SCCT variables within the model. These highlighted paths will guide hypotheses testing. Adapted from "Social cognitive predictors of adjustment to engineering majors across gender and race/ethnicity" by R. W. Lent, et al. 2013, *Journal of Vocational Behavior*, 83(1), p. 23.

Research with the SCCT predominately examines domain specific vocational interests using the six Holland (1997) types: realistic, investigative, artistic, social, enterprising, and conventional (RIASEC; Lent & Brown, 2006b; Lent et al., 1994, 2000). Holland's (1997) theory examines individual and work environment traits and factors to enable person-environment fit in relation to variables that are considered global, constant, and enduring (Larson et al., 2002).

Mechanical trade workers' tasks involve hands-on, practical, active work with machines and tools, both indoors and outdoors — falling within the realistic RIASEC type. Sheu et al.'s (2010) meta-analytic path analysis of the interest model across RIASEC themes reported findings that 37% of the variance in realistic interest was accounted for by self-efficacy and outcome expectations.

Within the SCCT, measurement of interest is concerned with aligning predictors and their measures in the same conceptual domain, with an appropriate level of domain specificity (Lent & Brown, 2006b, 2019). The focus is often on assessment at a task level, beyond just the occupational title itself (Lent & Brown, 2006b). It is then argued that mechanical trade interests will be operationalised as realistic interests for an integrative SCCT model of mechanical trade persistence.

Research Questions

From the literature review it has been argued that there is limited research in relation to understanding the domain-specificity of an integrative SCCT model of persistence for mechanical trade careers in Australia. Furthermore, the Australian agricultural machinery sector lacks a comprehensive evidence base to inform career development interventions that would help to address workforce priorities and develop a sustainable workforce.

The current research proposes to understand the psychological antecedents of mechanical tradespeople's satisfaction and persistence intentions in relation to these vital

careers within Australian agriculture. As such, the current project aims to address a gap in knowledge within the discipline of vocational psychology and provide useful evidence to the agricultural industry by adapting an integrative SCCT model of mechanical trade persistence.

The current research project aims to address this knowledge gap in the discipline of vocational psychology by providing useful evidence to the agricultural machinery sector and by deductively testing an integrative SCCT model of mechanical trade persistence. The main research questions this project seeks to answer include:

1. How can the core constructs of SCCT be operationalised in the domain of mechanical trade work in Australia?
2. How can the SCCT inform an integrative model of mechanical trade persistence in Australia?
3. How can these findings inform the attraction and retention of workers within agricultural machinery trade careers in Australia?

In attempting to satisfy the aims outlines above, it is important that the research design is informed by an appropriate paradigm and suitable methods are selected to generate the evidence required to answer these research questions.

CHAPTER THREE: METHODOLOGY

This chapter presents an analysis of the principles that underpin the research strategy used to adapt and explore an integrative SCCT model of mechanical trade persistence. The paradigmatic positioning of the current research project is discussed through the philosophical position of postpositivism. The epistemological and ontological boundaries of the research are also presented. Axiological positioning within the research project is explained via the vocational psychology of agriculture (VPA; McIlveen, 2015; McIlveen & McDonald, 2019), the psychology of working (POW; Blustein, 2006) framework, and a researcher-as-instrument statement. Finally, an overview of the sequential mixed-methods design to be used is presented.

Philosophical Perspective: Postpositivism

The postpositive view acknowledges researchers influence the research being conducted (Ponterotto, 2005) while also lending itself to conventional standards of rigour: credibility, transferability, dependability, confirmability (Morrow, 2005). These qualities call for the researcher to demonstrate credibility through their engagement with participants, observations in the field, the use of peer debriefers, and demonstration of researcher reflexivity, while undertaking the objective role of distanced observer to approximate the reality being observed (Morrow, 2005).

Drawing on the POW (Blustein, 2006) framework, the rigorous contextualised method of psychological research offered is an exploratory sequential research design, sourced through detail rich context (Blustein, Kenna, Gill, & DeVoy, 2008; Levitt et al., 2018). The research involves a sequential mixed-methods approach of two studies: a qualitative study with data collected by interviews and a quantitative study with data collected by survey. Such mixed methods research is consistent with the tenets of postpositivism.

Axiological Considerations of the Research Project

Essential to framing my position within the current project are the axiological considerations, both paradigmatic and personal. Reflective introspection acknowledging the role of my values in the research process is included as a researcher-as-instrument statement (Morrow, 2005), describing how my personal experience and engagement with the agricultural industry informed this research project (Levitt et al., 2018; Ponterotto, 2005). Self-reflection on personal motivations and knowledge, that informs the analysis and understanding of both the qualitative and quantitative data.

Vocational Psychology of Agriculture

The Vocational Psychology of Agriculture – Farming Food and Fibre (VPA; McIlveen, 2015; McIlveen & McDonald, 2018) emphasizes the vital role that vocational psychology should contribute to the agricultural sector, through addressing problems related to labour supply and work quality, and capacity to meet global food and fibre requirements. The VPA conceives that vocational psychology research within STEM domains should incorporate agricultural domains to eliminate global hunger and poverty, and concomitantly improve global health and wellbeing (McIlveen, 2015; McIlveen & McDonald, 2019). SCCT's prominence in modern career development and vocational psychology research informs its utilisation as the guiding scientific framework of VPA research (McIlveen, 2015; McIlveen & McDonald, 2019).

In addition to this scientific theory, the VPA is motivated by the ethical lens of the psychology of working (Blustein, 2006, 2013) towards the advancement of global human rights regarding access to decent work, while advancing epistemological contributions to agricultural career development (McIlveen, 2015; McIlveen & McDonald, 2018). Bluestein's (2006, 2013) framework responds to theoretical models of applied psychology and career development that center around individual career choice and volitional decision

making. Furthermore the framework enriches existing career development theories by expanding their impact to a broader, more typical work context (Blustein, 2013; Duffy & Dik, 2009).

Psychology of Working Framework

The psychology of working (POW) framework is founded in vocational psychology, multicultural psychology, intersectionality, and the sociology of work; and considers working a central aspect of global life (Blustein, 2013; Duffy et al., 2016). It highlights the equal role that contextual factors such as social class, privilege, and freedom of choice; play with individual factors of career selection and fulfilment (Duffy et al., 2016; Duffy & Dik, 2009). The POW framework responds to current theoretical models of applied psychology and career development that center around individual career choice and volitional decision making (Blustein, 2013; Duffy et al., 2014). Current vocational research is contextually seen as being undertaken through a narrow, privileged view of personal choice and volition; without inclusion of careers undertaken to meet survival needs for food, shelter and social capital (Blustein, 2013; Duffy et al., 2016).

The POW framework seeks a new paradigm; to understand the work lives of people of all levels of privilege, volition, and context, to assist with achieving well-being, and quality of work life goals for all individuals (Blustein, 2011, 2013; Duffy et al., 2016). The framework expands the focus of career decision making theory to a more inclusive perspective, on the basis that most individuals do not have complete work volition (Duffy et al., 2015). Work volition is defined as the subjective-experience of freedom to make career choices, despite constraints influenced by societal inequities and intrapersonal psychological experiences (Duffy et al., 2015).

The POW framework captures contextual and psychological variables (Duffy et al., 2016) and is supported by diverse epistemologies including logical positivism, post-

positivism, and social constructionism to understand the nature of working (Blustein, 2013). Securing decent work is considered a central aspect of life, linked to personal well-being and mental health outcomes; as well as fulfilling core human needs of survival and power, social connection, and self-determination (Blustein, 2013; Duffy et al., 2016).

Decent work is conceptualised as (a) physical and interpersonally safe working conditions, (b) hours that allow for free time and adequate rest, (c) organisational values that complement family and social values, (d) adequate compensation, and (e) access to adequate health care (Duffy et al., 2016). The POW framework seeks to explain the process of securing decent work (Duffy et al., 2016), as it is considered a central mediating variable between contextual factors and need satisfaction, work fulfillment and well-being outcomes (Blustein, 2013; Duffy et al., 2016).

Work plays an essential role in the development, expression and maintenance of individual's psychological health and well-being (Blustein, 2008). In this sense, contemporary vocational psychology has the capacity to contribute to individual well-being in educational and work settings, with interventions designed to promote satisfaction in career-relevant domains contributing to overall life satisfaction (Brown & Lent, 2016).

Researcher-as-Instrument Statement

I grew up in a working-class family in regional Australia. My father worked as an electrical draftsperson for a local company that manufactured trains and my mother had a career as a bank teller. We were engaged in the local community through sports and had close ties with our extended family. My uncles mostly worked in trades, such as boiler making and painting; and my aunts mostly in human services, such as teaching and childcare. I also had very close contact with my maternal grandfather, who was an automotive mechanic. Those around me were very practical, hardworking, and family oriented people, providing a solid foundation to observe and learn about the world.

I consider the start of my identity as a worker to stem from childhood and involvement in the community, such as helping my mother and our peers with team catering at our local cricket club. This progressed to babysitting and then a retail position in a local department store. During secondary schooling, I gained support from a school guidance officer to determine what options I would consider upon completion of my high school education. My approach to knowledge, combined with a keen interest in people, lead to the occupation of psychologist as my career choice. I realise the position of privilege I was provided, in terms not only of choice, but in relation to the ability of my parents to support me financially in the choice of attending university. One month after I turned 17 years old, I left my regional town to attend university in our state's capital. While I enjoyed my chosen university course, I did not enjoy metropolitan living and consequently moved to a regional university to complete my studies.

Throughout my undergraduate degree I developed a keen interest in organisational psychology. After graduation, I worked as a training and placement officer, assisting people with disability to enter and retain meaningful employment. This was an enriching and diverse position entailing on-site assistance to disabled workers, their employers, and their co-workers; across a broad range of occupations. I further developed my professional skills by moving into a supervised registration program as a Psychologist. I then entered the field of vocational rehabilitation, working as a rehabilitation consultant supporting with people with a disability, injury, or health condition. Both work roles encompassed career development support to workers in regional areas of Australia.

I believe strongly in science as an approach to knowledge, in everyday life and in my work. I strongly identify as someone who is passionately concerned with growth and development. I strive to discover who I am and how I can become my best personal self, always with a quest for self-knowledge and self-improvement as a drive for my imagination.

I also want to help others to make that journey, as I'm naturally drawn to people and wish for the human race to fulfil its potential. I believe cooperative work for the good of all is important, as life is filled with possibility and rich meaning. My notes regarding my career goals included words such as strengths, values, growth, well-being, resilience, connection, adaptation, idealism, universality, human potential, evolution, positivity, journey, flourishing, creativity, and connection to people, our natural environment and the earth.

I sought to contribute to something bigger than the individual, something that contributed to the community in my role as a worker. I identify as an idealist and therefore moving my career into a period of research was an ideal opportunity to pursue these preferences. As a psychologist, with experience in career development and vocational psychology, I consider focus on development of the capacity of our food and fibre sector to be an utmost priority, and a valuable career contribution. Aligning with the Australian Collaboratory for Career, Employability, and Learning for Living (ACCELL), finding a research centre that prioritises vocational psychology research, particularly focused on supporting the agricultural industry is an ideal match with my values and professional skills.

In addition to my personal experiences, our family owns an agricultural farm machinery business in regional Australia. We are immersed in the setting of supporting the agricultural industry to meet production demands, through meeting their machinery needs with the help of a highly skilled and diverse workforce. I am grounded in the culture and have spent years building trust and rapport with other employers, employees, and industry. I have drawn upon this immersion in context and my diverse workforce experience from vocational rehabilitation to develop this research project. I see firsthand the importance of the industry and supportive networks, in order to meet food and fibre demands. I am involved in direct industry discussions regarding difficulties attracting and retaining workers in a sector of the agricultural industry, both regionally and internationally through a supported dealer network.

I see firsthand the gaps in the role of vocational psychology in supporting this industry, as well as the capacity to further engage with the industry to conduct first class research.

These experiences inform my desire to engage in best practice in vocational psychology to contribute to improvements in the workforce and use research to inform quality career development in agriculture. I carry these experiences into my current role as a researcher and have a desire to ensure any knowledge generated from the findings of this research are translated into careful and considered recommendations to be integrated into the agricultural machinery industry's workforce strategies.

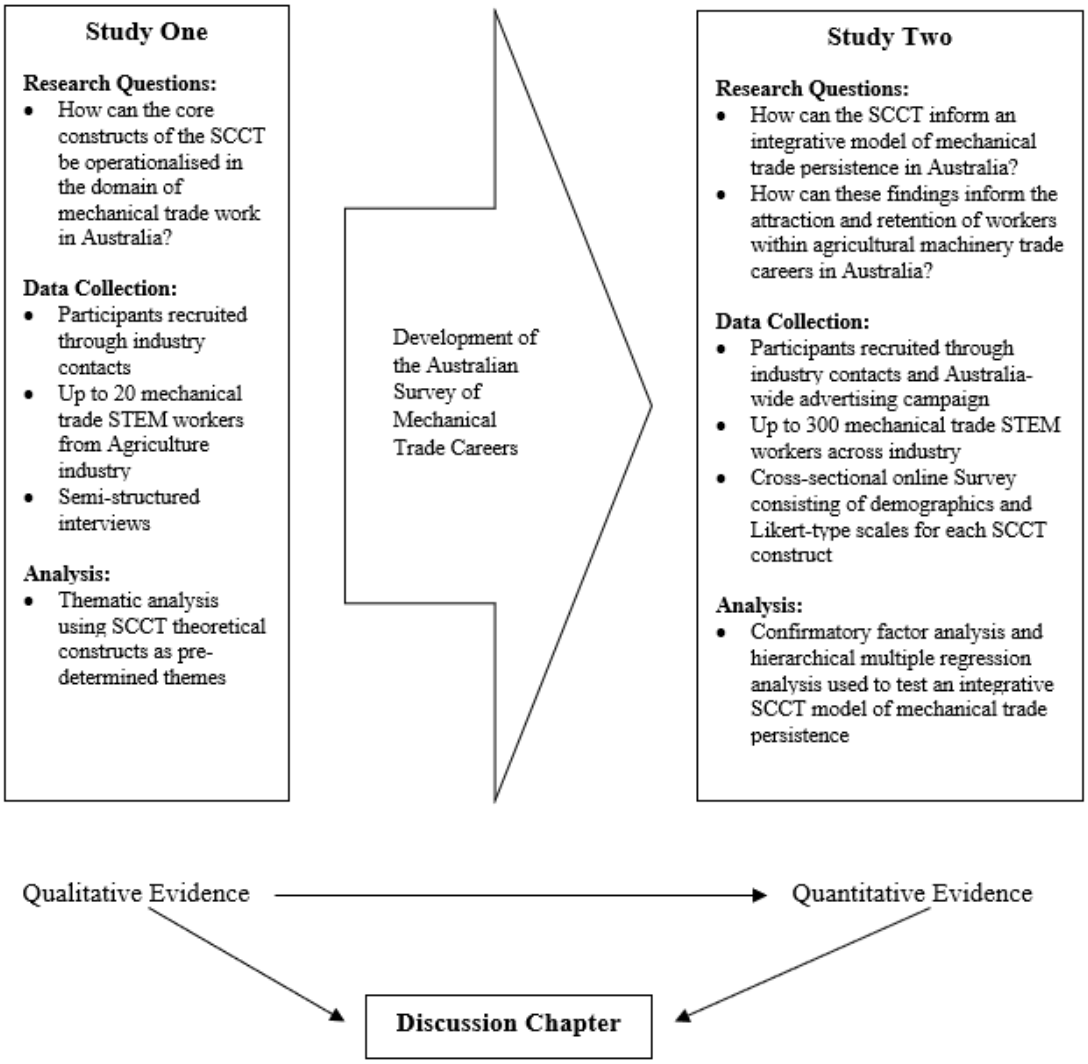
Mixed-Methods Approach

The research was conducted using a mixed-methods sequential exploratory design to answer the research questions (Hanson et al., 2005). Study One will firstly took a qualitative approach to understanding SCCT in domain of mechanical trades careers in Australia. Study Two took a quantitative approach to testing an integrative SCCT model of mechanical trade persistence.

Initial qualitative research is considered a primary methodological choice to determine domain specific aspects of career development according to the POW framework (Blustein et al., 2005). Blustein et al. (2005) indicate that qualitative research provides a critical context within which to expand the capacity of psychology research, as it occurs in natural settings from the perspective of the participant. Contextualisation is a core influence of SCCT model performance, requiring domain specific information. As the research involved a sequential mixed methods approach of two studies (Hanson et al., 2005): a qualitative study with data collected by interviews and a quantitative study with data collected by survey comprising standard measures of theoretical constructs, the research method was also consistent with the tenets of postpositivism. Figure 9 provides a visual representation of the sequential mixed-methods research design for the current project.

Figure 9

Sequential Mixed-Methods Research Design for the Current Research Project



Adapted from "Exploring Cotton Farm Workers' Job Satisfaction by Adapting Social Cognitive Career Theory to the Farm Work Context" by N. J. McDonald, 2017, p. 60.

Study One was qualitative and involved semi-structured interviews with a convenience sample of up to 20 mechanical trade STEM workers. Study One aimed to facilitate exploration of the phenomenon of interest relevant to the research questions, from the perspective of the participants (Lent & Brown, 2006b). Study One took a qualitative approach to understanding the domain of mechanical trade career persistence within the context of SCCT. The dependability of the findings, including information about the emergence of the research design, research activities and processes, influences on data collection and analysis, emergent themes and analytic notes will form part of the research data according to the postpositive paradigm (Levitt et al., 2018; Morrow, 2005).

Study Two was quantitative and involved cross-sectional online surveys of up to 300 mechanical trade STEM workers throughout Australia. Study Two aimed to test an integrative SCCT model of mechanical trade career persistence, as well as specific hypotheses drawn from the theoretical model. Study Two took a quantitative approach to analysing the SCCT in the mechanical trade domain, involving administration of standardized measures of theoretical constructs, testing an integrative SCCT model of mechanical trade persistence. Study Two focused on standardised method of obtaining knowledge from a large sample of individuals, as such the research is nomothetic and etic (Morrow, 2005).

These data were analysed statistically, including testing hypotheses by hypothetico-deductive logic. The aims of Study One and Study Two were to allow further application of the research findings to the context of the agricultural industry, after general findings were reliably established in the context of mechanical trade STEM work. While the aim of this process of postpositive research was to test theoretical constructs and hypotheses predicted by the SCCT theory, that this research is inherently limited by the quality and volume of data available. Whilst every effort was made to recruit sufficient volume of data, it is

acknowledged that there will always be more value in having more data to complete more advanced testing of hypotheses.

Conclusion

It has been established that the current research is positioned within the post-positive paradigm. Epistemological and ontological implications of post-positivism were discussed, as were axiological considerations. An extensive researcher-as-instrument statement outlined the researcher's beliefs and opinions relevant to the research project. This reflective exercise was completed and included to make explicit the potential values that could impact the research, and by doing so, enable to research to set these aside and strive for objectivity in the data analysis and interpretation of results. Finally, the sequential mixed-methods design was linked to the three research questions. I now turn to the first study.

CHAPTER FOUR: STUDY ONE

This chapter presents the method and results of Study One. Information about participant recruitment, participants, source of data, and ethical considerations are presented with consideration for the trustworthiness and rigour of the research. The results are then discussed with implications for development of the survey to be used in Study Two. More in-depth discussion on the overall practical and theoretical implications from the current research project informed by Study One results are reported in Chapter Six.

It has been established in Chapters One and Two that attracting and retaining mechanical tradespeople within careers in regional Australia is of national importance. Understanding more about mechanical trade workers' thoughts, behaviours, values, and intentions, and the interaction of these with the environment to influence satisfaction and persistence intentions is necessary to inform retention of mechanical trades workers.

Despite the global significance of the agricultural sector, vocational psychology does not yet offer necessary theoretical nor practical contributions to identification and development of variables associated with the attraction and retention of these vital regional infrastructure workers. Although the SCCT provides a comprehensive and new approach to understanding Australian mechanical trades work, the lack of vocational psychology research into mechanical trades careers in general and specifically in the Australian context, means there is little empirical evidence describing the work context in enough depth to confidently quantitatively measure the SCCT.

Lent and Brown (2006b) recommend a valid and reliable SCCT research process by guiding conceptualisation and assessment of the core constructs of the theory across domains. Initial qualitative research facilitates exploration of the phenomenon and provides greater depth of understanding in relation to the constructs of interest. For example, the operationalisation of outcome expectations is not reliability measured across SCCT research

(Brown & Lent, 2019) and therefore requires further exploration in context in order to understand how this construct should be operationalised for mechanical trade STEM workers. The present approach will provide experience-near information (Blustein, 2006) to determine the face validity of domain specific operationalisations of SCCT variables of interest related to mechanical trade persistence intentions and inform the selection of psychometric measures for Study Two.

Study One aimed to address this gap of knowledge in the discipline of vocational psychology and provide useful evidence to the agricultural machinery sector, by deductively testing an integrated SCCT model of occupational persistence in a previously unexplored group who enter the workforce via the Vocational Education and Training (VET) system. In the instances of studies investigating gaps in the SCCT literature related to domain-specific predictor variables, there is a need for a measurement development phase prior to, or in conjunction with hypothesis testing (Lent & Brown, 2006b). Study One involved semi-structured interviews with a purposeful sample of 19 mechanical trade STEM workers, facilitating exploration of the phenomenon of interest relevant to the research questions, from the perspective of the participants (Lent & Brown, 2006b).

The interviews explored social cognitive factors related to career motivations for mechanical trade STEM work careers, across industries, based in regional and rural areas of Australia. This included discussion around self-efficacy for mechanical trades, occupational interests, expected outcomes of the occupation, occupational intentions, barriers and sources of occupational support. Interview data was gathered to the point of redundancy, following interview transcription and the use of thematic analysis, using NVivo. Thematic analysis is a widely used qualitative analytic technique that provides a systematic procedure for developing codes and themes from qualitative data (Clarke & Braun, 2017; Levitt et al., 2018). The themes identified through Study One will inform modification of the conceptual

model and the selection of factor-based psychometric measures to be used to test the model in Study Two.

Method

This section presents an overview of participant information, the method of participant recruitment, the source of data, ethical considerations, trustworthiness and rigour of the research, and data analysis strategies.

Participants

The participants were 19 mechanical trade STEM workers, all of whom identified as male. Their ages ranged from 18 to 65 years (M = 39.5, SD = 14.5). The key recruitment criteria stipulated that each participant self-identify as being an apprentice or having completed a trade qualification as a mechanical tradesperson, in a nationally accredited Australian Mechanical Trade Qualification. The key recruitment criteria also stipulated that the participants must be employed in a role primarily focused on their mechanical trade; in regional, rural or very remote locations in Australia, as classified by the Australian Statistical Geography Standard (ASGS-RA).

The participants reported having a range of qualifications, including diesel mechanic (e.g., heavy duty, automotive, automotive transmission, mobile plant, and road transport), automotive mechanic, light vehicle mechanic, and helicopter transmission mechanic. The period the participants had been employed as a mechanical tradesperson ranged from 2 to 38 years (M = 17.8, SD = 12). Participants were employed in roles such as diesel mechanic, diesel fitter, mechanical fitter, maintenance technician, automotive mechanic, workshop foreman, workshop principal, and independent inspector; supporting industries including agriculture, transport, automotive, mining, construction, gas, local government, and aviation. Participants workplaces were located in southern Western Australia, northern Western

Australia, central Victoria, central Queensland, southern Queensland, and south east Queensland.

Participant Recruitment

Participant recruitment predominantly utilised my developed networks, involving direct contact with suitable employers of participants, or direct contact with participants themselves. Five participants were recruited through their employers within an agricultural machinery dealership network that is known to me. Two machinery dealers discussed participation in the research project with their mechanical tradespeople. I travelled to those workplaces to conduct interviews with willing and available participants. A third dealership was approached regarding potential participation in the research project, however they declined due to seasonal availability of their staff.

A further two participants were recruited through personal contacts. Both participants lived in central Queensland and were fly-in-fly out workers across the mining/construction and gas industries in Western Australia and the central Queensland coast. Following this, a production manager in the agricultural and heavy vehicle industry who is known to my networks, recruited three participants from their workplace. While workplace schedules did not permit interviewing of these participants during work hours, the three were willing to engage with me through phone through interviews after work hours.

A regional council plant and fleet branch manager also engaged and was able to support recruitment of another three participants. These participants were able to be interviewed at their workplace with the support of their employer. An additional participant in the aviation industry was recruited through networking.

Further recruits from automotive mechanical trades were then sought. This included an attempt to utilise a contact within a roadside assistance service, however while this employer was willing to engage, there was no eligible participants in their work team at the

time. Another networking contact was able to support recruitment of a relative who was an automotive mechanic and was amenable to phone interview after work one evening. Through another network, an additional self-employed mobile automotive mechanic was recruited. This participant had recently commenced work as a self-employed travelling automotive mechanic for the year, after having worked in a retail environment for several years previous. They were only able to be contacted via telephone, due to their remote location in Victoria at the time.

As the research period progressed, participant recruitment moved to canvassing of suitable employers or participants outside of known networks. Several attempts were made to recruit participants who identified as female, however these attempts were not successful: This included attempts such as the aviation mechanic forwarding recruitment details to a female colleague, contacting female mechanical apprentices who had been in media for their work, contacting a self-classified female mobile mechanic and several self-identified female mechanics through twitter hashtags. Additional non-successful attempts at canvassing for participants outside of my network included contacting an agricultural apprenticeship agency and two large farms who were known to employ mechanical tradespeople; one in the Northern Territory and one in far North Queensland.

In a final round of targeted recruitment, an additional four mechanical tradespeople participated in Study One. An agricultural and heavy machinery business provided access to a participant pool through contacts associated with my agricultural machinery network. A further three interviews were conducted at this worksite, during work hours, and with the permission of the employer. A final participant within the automotive/gas industries was located who was willing to be interviewed after work, via the telephone.

Source of Data

Data were collected via semi-structured interviews. Participants were informed that their participation would involve taking part in an audio-recorded interview that would take approximately 60 minutes of their time. All interviews were conducted one-on-one between myself and the participant, with eight participants interviewed at their workplace and seven participants interviewed via the telephone. Duration was related to the participants engagement with and response to the interview questions, with a range of duration from 15 to 74 minutes, and an average (*M*) time of 32 minutes (*SD* = 15.0).

The interviews were semi-structured in nature, with questions aimed to elicit information and discussion around the theoretical and operationalised constructs of the SCCT in the domain of mechanical trade careers (Lent & Brown, 2006). This included discussion relating to career entry, mechanical trades work domain experiences, and future career goals. Open-ended example questions were developed to elicit domain-specific information in relation to each theorised construct of the SCCT, in accordance with Lent and Brown's (2006) measurement guide for conceptualising and assessing social cognitive constructs in career research. The questions were designed to provide the opportunity for respondents to recall their experiences and focus their discussion in relation to their work within the mechanical trade domain. The interview schedule is presented in Table 1.

Sometimes the participant answers to questions were elaborate enough that further information was not required to answer the remaining questions in the interview schedule. Further detail about the results of the information collected in the interviews and the relationships between this information and the SCCT constructs is reported in the Results and Discussion section of this chapter. I completed all data transcription related to the semi-structured interviews.

Table 1

Study One Interview Schedule

Variable	Interview Questions
Choice	1. What attracted you to working as a mechanical tradesperson?
Self-Efficacy	2. I'd like you to think back to the time when you considering what job you were going to choose when you finished schooling. Mechanical tradespeople perform tasks like dismantling engines, using hand tools, cleaning and repairing parts, testing machines. How confident were you that you could successfully learn and do the mechanical trade tasks?
Sources of Self-Efficacy	3. What can you tell me about your hands-on experiences, like dismantling, repairing or adjusting engines or machinery before you chose to work as a mechanical tradesperson? 4. What those experiences in mind, how confident were you in your hands-on mechanical skills before you chose the trade? 5. Before you started your mechanical trade training do you remember what it felt like when you worked on engines or used tools to repair things? 6. Prior to starting work as a mechanical tradesperson can you tell me about any experiences you had where you watched other people working on engines or machinery and what that was like for you? 7. Was there someone in your life, like a family member, a friend or a teacher who encouraged you to pursue work as a mechanical tradesperson? Can you tell me about that experience?
Realistic Interests	8. What interested you about working as a mechanical tradesperson?

Variable	Interview Questions
Barriers and Supports	9. Can you tell me about your experience gaining your training and entering work as a mechanical tradesperson?
	10. What tasks or situations have you found most challenging about your work as a mechanical tradesperson?
	11. Can you tell me what's helped you to overcome these challenges?
	12. Has there been any factors that have made challenging work situations more difficult?
	13. What keeps you motivated to keep up your training and skills in the industry?
Outcome expectations	14. What did you expect the future would hold when you chose to work as a mechanical tradesperson?
	15. Has working as a mechanical tradesperson been what you expected?
	16. Now that you are in the job, can you tell me some of the tasks or activities that you perform as part of your role as a mechanical tradesperson?
	17. What do you expect now from your future in working as a mechanical tradesperson?
Satisfaction	18. Do you feel that you are satisfied with your work?
	19. What aspects of your work do you particularly enjoy?
Persistence Intentions	20. Where do you see your career as a mechanical tradesperson heading?
	21. Do you intend to persist in your work as a mechanical tradesperson?

Ethical Considerations

Study One was reviewed under a research project proposal by the University of Southern Queensland Human Research Ethics Committee prior to any participant recruitment (Ethics Project Code: H18REA022). Researcher skills in semi-structured interviewing and knowledge of the work domain were utilised to establish rapport throughout the interview process, which positioned participants as domain experts.

Careful ethical consideration associated with the collection of data included a process of informed consent with each participant regarding the nature and purpose of the research, bounds of confidentiality, data use and storage, the right to withdraw, the nature of any anticipated risks, and how to manage adverse reactions. The participation consent process involved the provision of verbal information, as well as a participant information sheet detailing all aspects of ethical consideration. Participants provided their written consent to participate in the interview prior to commencement of audio recording of the interview questions.

Participants were informed that Study One was specifically aimed towards no more than 20 mechanical trades STEM workers (i.e., diesel fitters and mechanics), employed across a range of industries, in regional and rural areas of Australia. Participants were also informed that the purpose of the project was to investigate personal career-related factors, such as occupation specific beliefs, expectations, interests, and personality variables that attract and retain individuals within mechanical trade qualified STEM occupations, specifically in rural and regional areas.

Participants were informed that the research team requested their assistance because there are national skills shortages of mechanical trades workers across industry, in the context of technological changes, and increasing production demands. In addition, they were informed that the research would be undertaken in regional and rural Australia, where

employers experienced difficulty retaining skilled workers vital to prosperous business operations. Participants were informed that questions would be related to their experiences within the mechanical trade domain and example questions were provided.

Participants were informed that their involvement in the project was entirely voluntary. They were informed that if they did not wish to take part they were not obliged to. They were informed that if they decided to take part and later changed their mind, they were free to withdraw from the project at any stage, and that any data collected about them be destroyed. Participants were also informed that their decision whether to take part, to not take part, or to take part and then withdraw; would in no way impact their current or future relationship with the University of Southern Queensland (USQ), the Principal Researcher, or their employer.

Participants were informed that there were no immediate benefits from participation in this research. They were provided with information regarding both the short- and long-term anticipated benefits of participation in the research. In the short-term, it was anticipated that by determining the factors that make mechanical trade STEM careers in regional and rural Australia most attractive and rewarding to potential and current employees; employers and industry stewards could implement strategies to enhance motivation to engage with these careers.

In the long-term, it was anticipated that this research project could contribute to knowledge that can strengthen the labour force. It was expected that this research could directly inform education and human resource practices relevant to a vital workforce which needs to attract and retain STEM qualified talent. Participants were informed that there were no anticipated physical, economic, or legal risks to participating in this research project beyond those associated with normal day-to-day life. It was appreciated that time inconvenience was involved with participation in this project.

Participants were informed that there was an unlikely emotional risk that any participant disclosing information about his/her career may associate this content with discomforting thoughts or feelings. Participants were again informed that interviews may be terminated if they found this uncomfortable or distressing. Participants were informed that if they experienced any adverse reactions to the interview questions, to please contact Lifeline on 131114 or see their medical practitioner. They were informed that there was no anticipated long-term risk to participation in this research project.

Participants gave consent for audio recording of their comments during the interview. They were informed that all comments and responses would be treated confidentially unless required by law. Only the principle investigator, supervisors and associate research team members at USQ would have access to individual recordings and transcriptions. A professional transcriber may have been involved with transcribing de-identified versions of audio recordings through USQ, however this was not required.

Participants were informed that any data collected as a part of this project would be stored securely as per USQ's Research Data Management policy. Participants were informed that individual results would not be reported, and that a summary of the results of this project may be reported to them as a participant, as well as interested employers. They were also informed that summarising and reporting of de-identified results would be managed according to the nature of information requested and managed through the university, under direct supervision of the Research Director of the Australian Collaboratory for Career, Employability, and Learning for Living (ACCELL). Finally, participants were informed that Study One formed part of a larger program of research, which I would present as a PhD thesis.

Trustworthiness and Rigour of the Research

Morrow's (2005) criteria for establishing trustworthiness and rigour in qualitative research was utilised in the design and undertaking of Study One. Researcher reflexivity was practiced in several ways throughout the process. This included engagement with the participants and their industry, observation of mechanical tradespeople working within the domain, immersion within the work environment where interviews were undertaken in person, and at times, having a workspace within an agricultural machinery trades environment.

Immersion the mechanical trade environment allowed me to understand and connect with facets of the work environment such as heat and noise, to engage with the social environment and character of mechanical trades workers, to reflect upon the research process while literally immersed within the domain. Observation in the field also went beyond the workplace, to spending time in the regional towns where these workers were employed, seeing firsthand the distance from metropolitan areas and between worksites, to limits with access to services and facilities, and understanding more about the communities where the work is performed.

Participants were all made aware of my personal affiliation with the agricultural industry and associated biases or preconceptions that may come with this. My stance of naïve enquirer was upheld during the interviews. The interview process often involved verifying and clarifying information with participants, both in terms of their individual reports and in terms of general themes that were emerging from participants as interviews progressed. This process assisted me to ensure consistent collection of data and ongoing engagement with the domain of mechanical trades; ensuring that adequate breadth and depth of data was collected to answer the research questions and fulfil the purpose of Study One.

Data Analysis

Once interview data was gathered to the point of redundancy, I transcribed the interview recordings and analysed the data using NVivo11. Qualitative thematic analysis using a six-phase analytic process was used to identify and analyse themes in the interview transcripts to answer the research questions (Braun & Clarke, 2006; Braun et al., 2014; Clarke & Braun, 2016, 2017; Terry et al., 2017). This process provided a framework for developing a domain specific understanding of what mechanical trade workers experienced in relation to their career motivations and how the core constructs of SCCT could be operationalised for mechanical trade workers.

Thematic analysis provided qualitative techniques for use within a post-positive paradigm, allowing for standards of reliability in the process, while being theoretically flexible (Clarke & Braun, 2017; Terry et al., 2017) The overall research paradigm of the project fell post-positively, however the nature of Study One, including the active role of the researcher-as-instrument and subsequent thematic analysis process kept this study within the qualitative domain (Braun et al., 2014; Clarke & Braun, 2017; Morrow, 2005).

The coding process utilised within the thematic analysis was guided by scientific method, with theoretical deduction of themes guided by the interview questions and variables under review within the domain (Braun et al., 2014; Clarke & Braun, 2017; Terry et al., 2017). A coding framework was not utilised. The analysis was created around the intersection of the data with theoretical and conceptual frameworks, along with my disciplinary knowledge, research skills and experience, as presented through the researcher-as-instrument statement (Terry et al., 2017).

First Phase: Familiarisation with the Data. I conducted and transcribed all interviews. During the interview process, I took self-reflective notes, which were discussed along with progressive interview themes during regular supervision sessions. I further

immersed in the data by relistening to the audio recordings after transcription, both to check accuracy, and to engage further with the content while continuing to take notes in relation to thoughts and themes.

Second Phase: Coding the Data. The first level of coding was semantic, moving all data into codes centered around the variables of interest as operationalised through the SCCT. This process formed a descriptive foundation for investigation of the mechanical trade domain, in the context of the SCCT. Generating the initial codes demonstrated a representation of topics relevant to the scope of the research, which was again reviewed through the supervision process.

Third Phase: Searching for Themes. Further review of transcriptions and semantic coding, along with engagement with relevant literature, led to the development of more interpretive themes in the third phase of data analysis. The whole data set was reviewed, to progress through a latent coding process, while accommodating my reflective notes and early code formation. The identified themes generated a broader level of meaning from clusters with relevance to the research question. This process facilitated organisation of clear central organising constructs for the candidate themes, representing the dialogue of mechanical tradespeople.

Fourth Phase: Reviewing Themes. This phase involved quality control in relation to the identified themes, integration of theory, and the research questions. The data, codes, and themes were reviewed to ensure that there was enough useful data to support the analysis. This process again involved supervision and further level of justification for contextualising the thematic data of the domain regarding the SCCT and the original research questions.

Further literature was reviewed, along with data codes, allowing for relationships amongst the themes to be identified. Analysis within this phase allowed for both collapse and expansion of themes to ensure that they were internally coherent, and distinct from, but

related to each other (Braun et al., 2014). The themes were mapped against the SCCT model throughout this process.

To assist with development of the credibility and dependability of the research findings, my supervisors reviewed the interview data, my reactions to the interview data, my formulation of results, and my analysis with regards to the SCCT. Confirmability was addressed by detailed reporting of the research results including examples of verbatim statements made by the participants during the interviews, leading to development of the codes and themes, and explicit presentation of my biases through the researcher-as-instrument statement.

Fifth Phase: Defining and Naming Themes. Further detailed analysis of the themes and codes allowed me to deliver a coherent story about the data within the domain during the fifth phase of data analysis. Final theme demotions were conceptualised, allowing me to draw together a narrative related to the research question, ready to integrate the data into an analytic narrative.

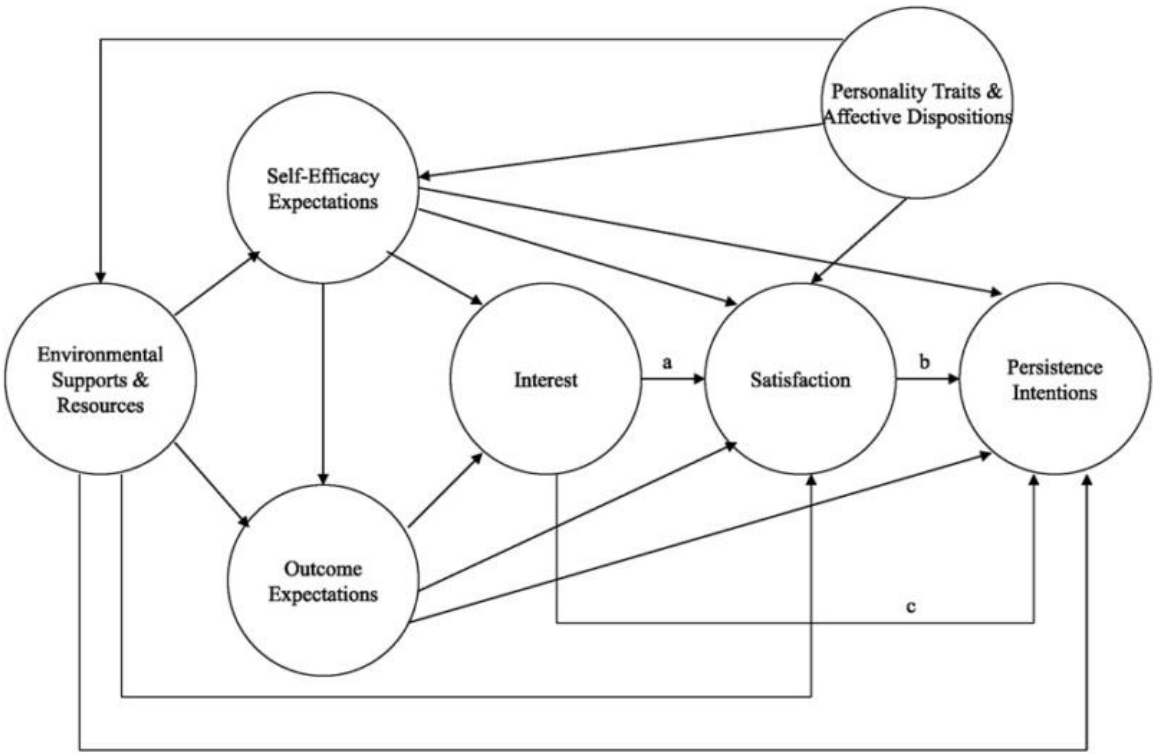
Sixth Phase: Producing the Report. The sixth and final phase involved integration of the analytic narrative with the data extracts and contextualising the analysis in relation to existing literature, as developed in response to the research question. This reporting of results allowed for a significant and polished response to the analysis, at the interaction of the data, the theoretical, and the conceptual frameworks, utilising my disciplinary knowledge, experience and skills.

Results

The results describe the data, organised by the theoretical constructs of an integrative SCCT model of mechanical trade persistence as represented in Figure 10. This included (a) satisfaction; (b) contextual barriers and supports; (c) mechanical trade self-efficacy; (d) outcome expectations; (e) personality and affective traits; and (f) realistic interests.

Figure 10

Theorised Integrative SCCT Model of Mechanical Trade Persistence



Adapted from "Social cognitive predictors of adjustment to engineering majors across gender and race/ethnicity" by R. W. Lent, et al. 2013, *Journal of Vocational Behavior*, 83(1), p. 23.

Satisfaction

Job Satisfaction. Many of the mechanical tradespeople who were interviewed spoke positively of their affective states in relation to their current job. Participant 1 reported “I do enjoy working here, actually I'm quite happy doing what I'm doing at the moment and being out here,” while Participant 2 reported “I love it. Yep. I enjoy getting out of bed, knowing that I'm coming to work to do something. Every day is different. A different challenge.” Regarding their job satisfaction, Participant 4 described:

> It's good, like you meet a lot of people, because I do a lot of mobile stuff, so I'm quite often out and about, you get to do a lot of driving, time to yourself to think about things, yeah, that's basically, yeah it's something different every day you know.

Participant 6 and Participant 11 also described strong positive affective states for their job with Participant 6 explaining “I love my job at the moment. It's one of the best jobs I've ever had, and I can't see finding another job better” and Participant 11 explaining “yeah, I like it now, I love it. Yeah, as I said, because I’m like, from day to day it’s very different.” In addition, Participant 10 stated:

> Yeah, very satisfied, yeah I find it very satisfying, when you’re, and especially here because you've got to keep the fleet going because we’re service based, you know you we’re keeping the town of Toowoomba going sort of thing. So yeah there is huge satisfaction in that.

Participant 18 also utilised positive affective sentiment when discussing their job, stating:

> I reckon it’s awesome. Like we all come here, bloody just come here and, yeah, I reckon it’s awesome. I get along with people, I love learning new things, just the work in general. Yeah, I am pretty happy, I enjoy it.

Occupational Satisfaction. Separating discussion around job satisfaction from discussion regarding occupational satisfaction can be problematic, however several statements made by the mechanical tradespeople related distinctly to occupational satisfaction. When asked how satisfied they were with the choice they had made to work as a mechanical tradesperson, Participant 1 stated “Oh very. Definitely I feel good. Like I said, I enjoy the work.” Participant 5 reported “it's all good. I love what I do. And I think you need to be passionate, and if you're passionate about what you do, you're halfway to succeeding.”

Additionally, Participant 7 stated “Yeah, I'm pretty happy with where I’ve got to and what I've done” in reference to their career as a mechanical technician in the mining industry. Participant 15 discussed “I’m pretty happy with the way that we went and what I’ve learned and where I did do it, um yeah, I’ve come out of it on top I think.” Others discussed their enjoyment of their occupation, making statements such as “I do enjoy it” (Participant 6), “oh yeah, I’m happy with the work yeah” (Participant 16) and “yeah, I love it. It’s what I always wanted to do, since a young fella, so. I enjoy it” (Participant 18).

Participant 9 discussed their occupational choices made through the military defence system, stating:

> When you get into it you start to get a bit of enjoyment out of it. Nothing’s what it appears to be until you start it, so, but it was good, I don’t regret my choice. I did quite well in my testing when I joined, so I had the choice, some 20 trades to choose from, all very, not all of them, very similar some of them, just specialising in little areas in defence so, yeah I went into the mechanical trade. I always loved tanks too, army tanks, so I asked the career people how do I get to work on them, and I that’s the stream that I went down so. I ended up doing that for quite a few years, like on the heavy armour. That was awesome, that was really good doing that work. I’m pretty happy with the decisions that I made yeah.

Contextual Barriers and Supports

Contextual Barriers. While contextual barriers are not operationalised in Study Two, they were investigated in Study One in order to further understanding of the mechanical trade domain.

Customer Expectations. For those mechanical tradespeople who had direct contact with customers, several described difficulties in managing those relationships. This included mechanical tradespeople within the automotive and agricultural industries. Participant 2 described instances where they needed to problem solve with the customer prior to commencing diagnostics, indicating:

> If you don't ask the right questions, you don't get the answers you want. And that's the biggest thing, it's making sure that you and the owner, the vehicle owner, the tractor owner are in the same area. They will tell you something and it will be the total opposite of what you're meant to hear. Because they don't understand, or they don't know. So that's probably the hardest, most challenging part of it. It's the customer relationship, dealing with them.

Participant 4 was also employed within the agricultural industry and described a range of ways that managing customer expectations and reactions impacted upon their work, describing:

> A range of things really, it can be anything from, all the parts have been organised wrong, you get to a job and the guy's got the shits on because his machine is broken or something, and all of a sudden it's your fault. You're only there to help them, but they're flipping out and carrying on like a two-bob watch. You know, things like where some people are anally retentive and you're not allowed on their farm unless you ring first, and you get sent out to a job an nobody is around sort of thing, so you get abused first thing, and that's the first impression, the first thing you do when you

> walk into a job and someone abuses for something that's not really your fault you know. That's when you get your back up and you get really shitty and it fucks the rest of your day too.

Participant 4 also talked of the pressures of meeting customer expectations of fast diagnosis and repair, as this related to the cost of the job they were undertaking. They reported that:

> Farmers like when you rock up, when you walk up and you just go, click, click and you fix it like that. They don't like when you're sort of stuck there for half a day and they can see the dollars ticking over in their head you know… they don't want you to sit there and drive the tractor around for two hours waiting for it to fail either, so it's a bit of a funny one … when you're actually out on the job, dealing with them face to face, some of them. Most of them are pretty good, but some of them just do your head in. You turn up and they expect you to know everything and diagnose it down to the very small problem that it could be straight away, instantly.

Participant 11 described a similar observation in relation to barriers related to managing customer expectations. As with several participants, they described the relationship between the introduction of electronic diagnostic instruments and the customer expectation of reduced diagnostic time or complexity when this is not actually the case. They stated, “it’s really hard because people are under the impression that we just hook a computer up and it says, your left hand shockie’s loose.”

Both Participant 14 and Participant 15 related difficulties around managing customer expectations, particularly in relation to the cost involved with labour. Participant 14 said “difficult customers. Sometimes they’re just expecting way too much, or they start off with a bad attitude, that they don’t like bringing their car in, don’t like spending money, don’t like mechanics in general and that sort of thing.” Participant 15 added:

> Yeah like on the customers end of it, like we had a lot, being a small workshop again, like the customer comes in, like you know, you're charging them 6, 7, 800 bucks but nothing's changed, you know you've just done a full service or something, changed all the oils and all that, and there you know, you're up for nearly a grand, but nothing physically in the car has changed; opposed to them coming in, spending the same money, and you've solved, it was running rough, or it had a huge knock, or something like that, you know, they're more okay with it if they can see the change, as opposed to they don't see any change and they're coughing up all this money and they don't really understand what they're paying for. So that side of it can be, a bit yeah, a little bit sort of tricky that, yeah.

Difficult Coworkers. In addition to difficulties with customers, many participants discussed the impact that difficult coworkers had on their work. For example, Participant 1 described:

> Yeah, we recently worked with a guy, he didn't last very long with us. He was very painful to work with. He tried to finish his apprenticeship twice with two different companies. Yeah, knew everything, you couldn't explain it to him. He came in thinking he was boss. So when you're working with people who you get along with and you know how they work, and they are willing to learn things that you've done off you, and you're willing to do the same, it's goes really smoothly in the workshop. But when you get that one person that thinks they know everything and doesn't want to take on any knowledge it's very hard.

Their father, Participant 2, agreed, saying "there's been a couple of guys through here that didn't fit and those days you know there is going to be a problem and you've got to go out somewhere. Where's a bailer I can go and fix?" Other mechanical tradespeople spoke of changing employers due to the barriers presented by difficult coworkers. Participant 3

explained:

> There was one old fella that was a bit domineering. We would all the work out the back and he would sit in the office and tell you in not a very polite way that you'd not done it right.

Participant 3 reported moving towns in order to remove themself from this relationship, whereas Participant 4 remained in the same town, but changed employers. Participant 4 said:

> It's just I was working with that guy and he give me the shits… I went to work and the bloke just started flipping out, acting like an idiot, so I rang Matt and said yeah, I'll take that job. Because he was a pretty grumpy sort of person the last guy I worked for, and I just had enough of him.

Participant 6, a mechanical technician in the gas industry also explained that challenging coworkers had a negative impact on their experience at work, explaining how they had worked proactively to manage this in a way that allowed them to remain with their employer. Participant 6 commented:

> The people I work with. The way they manage the system and the way you interact with the other techs. I find, the most challenging, I can do the work every day of the week, but the mind games that people play with-in job, I don’t do well, I don't really do well at that. But it's more people's attitude, but attitudes towards other workers. And how about how another worker treats another worker, and whether they deem themselves smarter than you. And they treat you like crap. Or they want your knowledge, but they don't want your help. And then some, and that's the reason why I looked at operations work, is to get away from the scenario at work. Crew wise, whether that would make me, at the time whether that would make me happier or that sort of thing, but I chose the style of work and changed my attitude to fit in better, or

something like that.

Participant 6's brother, a mechanical fitter, was employed in a similar industry with a role in construction. They reported similar experiences regarding interpersonal difficulties in the workplace. Participant 6 supported their brothers' statements, saying:

> I've been leading hand in the last two years. I've enjoyed that sort of aspect as in people coming to you for advice. But then you also get the negative side of it but, that everyone so of well, you get your name written on the toilet wall sort of thing and everyone hates you sort of thing. Different people talk, you get called things and it goes pretty well to heart, like you feel it a bit more. But then you sort of just realise what sort of people some of the other people are and you just stick away from them. There is always going to be those sort of people, even at school, they're sort of not really the bullies, in school you'd call them bullies, at work you just call them I don't know, it would be something else but they're always just trying to start something and make you sound worse, the sort of thing.

When Participant 6 was questioned, they indicated that workers literally wrote negative things about them on the bathroom walls in the workplace. They later used the term "fucking the dog," which they meant to indicate the wasting of time. Participant 6 went on to explain:

> You still want to be one of the boys but you've also got to be the discipline if you see him know, fucking the dog, which everyone does when it's quiet. But when you've got a leadership sort of role and you know they're fucking the dog, you've got to come in and say 'hey guys, when it's quiet I don't mind you stepping back and sort of doing nothing, but I said we're flat out we've got all this ahead of us, there's no need', but that's when they sort of start thinking who are you, you're just one of the guys but you're in between that sort of level. You're not quite staff but you're not one of the

guys on the tools either. It's sort of a hard thing to be in between."

Dirty Work. The realistic nature of mechanical trade work means jobs involve hands-on tool use, machinery operation, and industrial or commercial environments. This work involves both indoor and outdoor activities, regardless of weather and generally full-time work days. Many described this dirty work aspect as a difficulty of the work. For example, mechanical tradespeople in the agricultural industry may work on farm machinery in a paddock, dirt floor farm shed, in a machinery shed from above, or in a machinery shed from below in an underground pit. Participant 11, an agricultural mechanic, explained:

> When you rock out to a tractor that's covered in shit because the farmer has been too lazy to clean it, you sort of roll your eyes back. It's part of the cockies, it's one of the bigger things that you'll find, is that you go to service their tractor or whatever and they couldn't be fucked cleaning it or anything, and they don't want to pay to clean in, it's just how it is, and you can't do your job properly when something's covered in shit.

Participants 16, 17, and 18 were also employed in the agricultural industry and made similar comments about their experiences, such as "it's always dirty" (Participant 16), "that's where I spend the majority of my time, down in the pit, so," (Participant 17) and "most of the time I'm just here, in the pit" (Participant 18). Participant 12 worked for a different agricultural machinery business to Participants 16, 17 and 18, and reported that mechanics needed to be "committed to do the dirty work like we do," noting that "some days you do get really annoyed. You know like being in grease and oil every single day of the week."

A mechanical tradesperson in the automotive industry agreed, saying "well, yeah there is, the amount of shit you get covered in and how much you've got to wash your hands is a pain in the arse" (Participant 19). Participant 13, a mechanical tradesperson working in the aviation industry also commented "you expect everything to look like a space shuttle and it doesn't, it's got grease and grime and god knows what else on it." Participant 17 reported

similar experience, describing “diesel fitting, where your hands on dirty all day” as opposed “to mechanical fitting, where it was interpreting drawings.”

In addition to dirty and cramped conditions, one worker described the role that chemical exposure played in the roles that they and their work crew performed in the agricultural industry. Participant 5 reported:

> It goes back to safety again, is the chemicals involved. Not just your oils and stuff like that, in years gone by, no one probably thought that much about it, oil was on your hands, it doesn't matter sort of things, on your clothes it doesn't really matter, but also we work on sprayers as well. Now they are completely contaminated when we go work on them. If possible, we get the customer to wash them down, there's still a shitload of residue on them. So, all our guys have breathing apparatus, they all have access to proper chemical gloves, so if they need to work on something, yes have your safety gear on.

Other workers, such as Participant 15, who worked in the automotive industry, discussed the role that weather sometimes played on their work conditions, in addition to the role of dirty work:

> Sometimes the heat can get to you, sometimes you know like dirt and stuff like you know, it doesn’t really bother me much, um, pretty used to it, I don’t mind getting a bit dirty, but yeah like sometimes the weather and that, like sometimes you know it’s bucketing down rain, and you’re out in the rain trying to do something, or you know, you’ve got to make a house-call or something like that, you know and it’s bucketing down rain, or it’s 40 degrees or something, you know and it can be a bit hard.

Electric and Hydraulic Tasks. Many of the mechanical tradespeople interviewed presented feedback that they, or members of their team experiences barriers to their work that related to their skills performing electric and hydraulic tasks. This was consistent across

industry and often discuss in the context of increasingly complex designs of machines, equipment and subassemblies. Participant 5 explained:

> So, when I started in the ag industry, I knew that there would be areas that I would have to work hard to bring my knowledge up. One was electrics. I had a fairly good understanding of electrics, but machines are so complicated now that it's a whole new dynamic. And hydraulics, and the way I looked at those things, if you looked at something mechanical and it's broken, we you can say, that's broken. If you look at electrics and hydraulics, you can't see what's going on because it's hose, or it's a wire, and you can't see what's inside it.

Participant 11, a 37-year old mechanic was employed in a different role within the agricultural industry also supported these statements, indicating “then you start getting into the electrical side of it. It was very, not overwhelming, but nearly overwhelming the first time, trying to work it all out.” Another mechanical tradesperson employed within the agricultural industry discussed barriers related to “electrics, I don't think many people like to do electrics, working as a mechanic. It's always a bit challenging” (Participant 1). Participant 2 agreed, indicating:

> Electrical issues, they are probably the hardest. With the tractors now, they run white wires or brown wires. They are all the same colour, numbers on them, you've got to look up. There are so many electrical components on them now, that's the hardest by far. Um, its yeah, it’s an ever-changing deal with the tractors, with the electrical side of things.

Similar experiences were expressed across a range of work environments within the agricultural industry. With Participant 2 additionally noting “a lot of the times with electrical, say on the Fendt tractors, you need two techs to go out. You'll miss something, or they'll miss

something, or they've seen something before," indicating the need to utilise a team perspective when addressing this reported work barrier.

This mechanical foreman with an additional engineering qualification discussed their experiences within the mining industry. Participant 8 explained:

> These days with all of the electronics, you nearly need a computer or laptop to plug in because where a conventional engine basically works exactly the same way they've worked since 1904 or whenever they came out. And um, where now, that part of it's still the same, but they've got all of these electronic smarts around it that you can have a failure with, that affects the performance of that there, without actually there's nothing wrong with that there even though it's not working because of electronic issue, a sensor, mate that is the biggest hurdle we face as diesel fitters.

Working in the automotive industry, Participant 15 reported:

> In a smaller workshop it makes it very hard if we've got to chase an electrical problem and we need wiring diagrams, pinouts and stuff like that, it can be hard to get that information … that's probably been the most difficult thing.

Another automotive mechanic, who applied their skills within the mining industry explained:

> Out when you're on the rigs, I'm not too proud to pick up a phone and ring someone when I'm stumped, and you get times when you're stumped, especially with the hydraulics, you know multi-system hydraulics, you know, they run on computers and that sort of stuff, it's all pretty full-on.

Limited Learning Experiences. Several mechanical tradespeople expressed concern regarding changing skill development and limits with skill development within the occupation. As this mechanical technician who started their trade as a diesel fitter stated:

> The first part where I started my apprenticeship was a bit light on. I was on patrol boats, there was sort of one or two guys that would help you learn. With another person I was stuck with it was just cheap labour (Participant 7).

Participant 7 then moved to the mining industry and made similar observations for new trade recruits in this industry, stating:

> It's what they're doing, especially in the construction industry. They'd put on Apprentice fitters and mechanical fitters and they were just cheap labour, just saying that they put people on as apprentice. I asked some of them questions, when they'd come out of the trade, some of the ones we had in our group and they didn't know anything. Like they couldn't read the drawings.

With over 20 years' experience in the trade, Participant 7 also discussed their concern regarding the impact that the changing skill base would have generationally, upon the occupation:

> Also take it when a lot of us older people sort of retire. Not me I'm sort in the middle level. But yeah when the older people retire. There's going to be a big shortfall. I can see this. I said the way that they're doing training trades and that now. They're not learning.

Participant 19 expressed similar concerns indicating:

> The biggest thing that I find, is that I've been doing this for 20 something years and I can't remember the last time I had an apprentice. Who's gunna have my knowledge when I retire, like you go into any workshop and there's very few apprentices. So, you know who's training people, and not just that, like most of the young fellas, they go and plug the computer into it, but if the computer doesn't tell them what's wrong, they're stumped. They don't know the old tricks and how to diagnose stuff without a computer and you know, once that's gone, like I'm not big-noting myself, but any

> mechanic, any tradesman, once their skills have not been passed on to someone, what happens, we just become a throw-away nation, and you know, well that doesn't work fucking throw it away and put a new one in. But you don't have to do it if you know how to fix it.

With experience in both the automotive and mining industries, Participant 19 further added:

> Most of the government isn't taking those intakes of apprentices anymore, so for Ergon, all the work is contracted out, you know, to different companies and they don't take on apprentices, so, how do, who's going to be fixing all this gear in 20 years' time. They won't know how to fix it and they'll throw it away.

As a mechanical foreman working for a local council, a worker with 18 years' experience in the occupation agreed, saying:

> Like we were getting um, these guys are like vehicle mechanics, they're doing brakes steering suspension on trucks and then the hydraulic side of things like I was telling you about before, they've got no idea about hydraulics. They stuffed up there, Council (Participant 10).

Consistent with these comments, an aviation mechanic also discussed barriers related to skill development within their job, partly due to the role of increased technology:

> It sounds weird, but it's not as interesting, and you get to that point where the aircraft tells you what's wrong. I feel sorry, mainly for our apprentices, because it's like a dumbing down of their skills. Like we've got an apprentice that just graduated, and his systems knowledge is not really there, because you don't have to think about it as much (Participant 13).

Limited Technological Skills. The mechanical tradespeople also discussed work barriers that they related to technology in their occupation. Discussion centered around

several factors, including needing to increase technological skills in order to achieve their work requirements, through to the impact that others limited technological skills had on their work. This mechanical tradesperson aged in their 50's commented "with all the new technology... I see as probably easier for younger fellas coming in, into the game. So, computers are going to play a lot more part in it, computer diagnostics and all those sorts of things" (Participant 10). Aged in their 40's, a mechanical fitter explained that they were upgrading their computer skills in order to cope better with their work tasks. They commented:

> I look at the job that I've got now and I wish I was better at computers. My job now is 30 percent computer stuff and I'm on the tools. I'm trying to teach myself how to type so that I can use a computer a bit better (Participant 6).

A mechanical tradesperson aged in their 60's and working in the agricultural industry explained their concerns around working with technology. Participant 17 indicated "I've got no confidence at all with computers," further stating:

> Because I've never done much with them, they scare the crap out of me, because you're always, always, I don't know why, I keep on thinking that if you hit the wrong button you'll delete the whole computer out of the truck. It's not going to happen, but. And then they take so long to load up, when you plug in your diagnostic computer, it takes so long to load up and it's, that sort-of makes me start sweat.

Participants 11 and 12 reported similar experiences. Participant 11 discussed:

> As things have gone on, everything, even in the ag industry, actually in the ag industry probably more than anything I've found so far, it is all computer based if you work on anything new. I should say, yeah all the new stuff, which is all we pretty much deal in, it's all computer based, it's everything. If you're haven't got an idea about computers, it's really hard to do the job. We've got an older guy working for us

> at the moment and yeah he is a good mechanic, but he's not very computer savvy, so you try and walk him through the computer programs just the check codes and things just on trucks, and he can't do it … And it's really a pain in the arse, because every time he's got a truck, you think ah I've got to go and do the computer side for him. … The minute he has to do a computer problem, it's like ah shit, and it just drags you down because you know that eventually you're going to get copped with it, because he can't do it himself. So you've either got to go and fix it with him or you're going to have to go and fix what he's stuffed up and fix the job yourself, so yeah.

Participant 12, who also worked for the same employer as Participant 11, expressed the same concerns:

> Like trucks and like even tractors, tractors are more advanced in electronics than what trucks are. They're real but, you're still probably about 70 percent of mechanics need to know how to use computers as well, because you've got all the diagnostic. Like we have an older fellow at work, he does fit ups and that. And yeah he doesn't know how to turn a computer on or nothing. You need people that know how to get into computers, use them and all that type of stuff.

Participant 3, who was aged in their late 50's, discussed the difficulties they found in keeping up to date with the rapid influx of information that needed to be sourced through and in relation to computers and technology. They reported:

> Probably now days, the computers and the computer programs. I'm not over computer literate, I can weed my way through, I just find they change too quick and there's new scenarios that come in that are ahead of you all the time. It would be all right if we being a dealer and you sold ten of the one machine, you'd see repetition all the time, but we don't, we only sell probably two of the one model every time and they bring out a new model every 18 months' time. So, there's always things to catch you, so it's

> frustrating that type of scenario. You just always seem to be behind the eight ball all the time, trying to get that information in. And it's hard to get it to stick, just because you get so much variety and variation.

Physical Demands. While many workers discussed the dirty nature of their work, in addition, the mechanical tradespeople interviewed also discussed the impact of the physical demands of the role. Many discussed functional difficulties with undertaking the work, with some additionally discussing the impact of this upon their perceived capacity to persist in the occupation. For example, Participant 4, a heavy-duty mechanic in the agricultural industry stated:

> To be honest, I reckon by the time I'm sorta probably late 40's or 50's I probably won't be able to do it anymore. I mean I wake up these days now in enough pain and shit, and just that of some of the physical situations you've got to put yourself in, it's um yeah, it's hard work. You wake up pretty sore.

Participants 11 and 12, who worked with agricultural and heavy machinery supported statements made by Participant 4. Participant 11 explained:

> But you've just slaved away for an hour and a half, under a hot car or a truck or whatever, burning yourself on exhausts, hot oils or whatever … Yeah, look as long as I can, I think, it's very demanding on your body. Like a lot of people, the guys, sore back, sore leg, sore knees, sore hands. I'm no different from anyone, I suffer from it as much as everyone. So yeah, as long as the body holds out, I'll continue doing it.

Participant 12 supported these statements, by commenting:

> Doing this every day… You're bent over looking at the ground under the bonnet of something. And you know, once you get on with age, all through my 20's I was great with it you know. Then you hit 30 and the back says no, I've had enough of this … I started using my arms a lot more, and then my hands and my wrists, and things like

> that, and then my wrists so, and my shoulders or my knee hurts … I would be the one downfall of the job, just the fact that yeah, I don't know too many guys that aren't sore … every night I go home very sore. Yeah, like back, neck, shoulders, knees and all that type of stuff.

Participant 13, a helicopter technician stated:

> I've done 30 years out there too. I need to step back a little bit from what I used to do. I can't do as much as what I used to. … it all depends on how the body holds up I suppose.

Again, the participant discussed the impact of the functional demands of the work on their capacity to remain in their work role. He also reported "for myself, I had carpel tunnel surgery last year, in both hands, that was a little bit of a wakeup call, that I may not be able to do this forever."

A mechanic who worked in both the automotive and mining industries explained:

> At 44, you've got to start thinking as well, you know, so. … Like my hands are stuffed, my knee's stuffed, um, and I'm sitting here aching at the moment because I've been climbing in and out of shit all day, my back's killing me, but um, you know. How many old mechanics do you still see out on the floor? You just don't see any. The ones that are over 50, they're just doing the jobs, say engine rebuilding, or workshop type stuff, where you're at a bench and you get a seat to sit on, and you know, the old jobs doing diesel injector pumps in the cleanroom and those sort of roles. … Yeah, and up and down on machinery, and lying on the ground, and lifting stuff that's too heavy to lift. I lifted a battery today, it would have been 60 kilos. … Yeah, and you just can't do it forever. Messing around at home with cars is one thing, but being able to carry on like this, you know, I see myself seriously, buying, I'd have to buy myself a job basically, at 55. No one's going to want to hire a broken down 55-

year-old mechanic, you know (Participant 19).

Another participant, aged in their 60's provided further support, commenting:

> Oh yeah, when you were young, yeah, it wasn't a problem. And the heaviest part wasn't a problem, but it is now. Everything hurts, and you can't lift and do as much as you used to be able to, which is frustrating. Especially here, now that it's on concrete all day, that knocks the hell out of your legs (Participant 17).

Repetitive Tasks. In addition to explaining that their work is dirty and physically demanding, a range of mechanical tradespeople discussed their disinterest in engaging in repetitive tasks within their work roles. Participant 11 commented:

> I find doing the same job over and over again really boring and that is the one thing with it, you know some days you just get a run of change oil, change oil, change oil, change oil, change oil, all day long, everyday for three weeks straight and by the end of it, it's really, look for me anyway, it really sort of gets you down and you're like no, I'm over it, I'm better than this. And other days you get, or other weeks, you get four or five clutches in a row, and then you're over that. So, I find that if you can do a service, then a clutch, then go do tractor work and then go and work out an electrical problem, it's really great. If you can get into the role of, or get into the routine of different jobs all the time, it's really really good. If you just do the same job, over and over and over and over again, it's yeah, it gets a bit boring.

Participant 12, who worked for the same employer as Participant 11, also discussed their concerns about repetitive work tasks. He explained:

> Some days you do get really annoyed. You know like being in grease and oil every single day of the week. The problem I had was, I always done like all of the clutches because I started doing them when I was first year. I can get them out pretty quick. And then all the oily job I used to do them, so I kept doing the same thing for six

months straight and then I used to get really frustrated and angry.

Employed within the aviation industry, Participant 13 also discussed their concerns about engaging in repetitive tasks, they commented:

> The thing that I hated about the deep level maintenance at QANTAS, partially was that the team leader that I had, he liked, you know like doing wings, each crew had a section of the aircraft to work on, and we did left wing all the time. And for whatever reason, he just liked it that way, and it was just the same sausage factory day in, day out, no variety.

This aligned again, with comments made by Participant 19 in relation to their early work gaining their automotive trade. Participant 19 reported:

> I did my apprenticeship with the Brisbane City Council fixing buses. It was boring as shit, because it was the same buses all the time, same colour scheme, same everything. Every now and then you might get one with a different add on the side of it, but other than that they're all the same, and you know.

Perceived Organisational Support.

Organisational Support. In comparison to barriers noted by mechanical tradespeople in relation to their work, organisational support was discussed by many workers. In the mechanical trade context, Organisational Support has been operationalised as support provided in the context of an organisation or within the role of employer/business. In Australia, the nature of work trained through the vocational education and training sector, means that often, the employer has dual roles, as both a manager and trade supervisor. This is particularly the case in small business. Data coded under the Organisational Support theme, related to support directly provided in relation to organisational/management roles, rather than support provided in relation to trade skills. In practical terms however, both forms of support may be provided by the same person in many workplaces.

A clear example of the provision of organisational support was provided by Participant 2. They discussed the need to change jobs due to their wife's ill-health and the support they gained organisationally in relation to both moving on and subsequently returning to the workplace. Participant 2 explained:

> I did take a break. I've only been back 3 weeks. I took a six-month break. It was painful. I hated every minute of it. So I came and saw Damo. He was looking for a mechanic and so I said here I am. So he welcomed me back. The main reason I left here was because my wife was sick. So, the guy that I was working for had a farm out in the country, but he also had a base in Perth. So the idea was for us to get back to Perth, for my wife to get through her illness, but unfortunately it didn't work out the way it was meant to be. Just with my wife being sick I had to get back to Perth, but it just didn't happen. And Damien understood even when I left what was going on.

Participant 1 also discussed the same employer, noting "Damien is good as a boss. As Damien stated, as your knowledge gets better on the equipment that you work on, so does your pay." Both Participants 1 and 2, valued the transparency that was provided them in relation to their ability to advance.

In the mechanical trade environment, many employers were referred to as "the boss." Several workers spoke of their employer as being supportive, such as Participant 3, who commented:

> As long as you can kind of see that basically the boss of the dealership is trying to do the right thing to them and they're trying to do the right thing to you. … I ultimately said to my boss when I did it, I said to the boss, I'll give you six years and see where it is from then. Then obviously that got forgotten, and the pay went up and I got a bit more encouragement to stay there.

Both Participant 1 and Participant 3 spoke of the role of organisational support in

relation to encouraging their persistence decisions with their employer. Participant 12 also discussed the role of organisational support in relation to their persistence intentions, commenting:

> I've got offers from other companies in excess of nearly 300 bucks more a week. But the loyalty from this company so far, I've just stayed with them…the Maryborough bosses are pretty good and I get along with all the boys. That's what pretty much keeps me there because I, you get a good like, just kind of second family like you spend more time working with them, then you're at home.

Working in a small regional business that provided mechanical services for trucks, tractors and heavy machinery, Participant 18, an 18-year old heavy diesel mechanic commented:

> How it runs, I reckon it's awesome. Like we all come here, bloody just come here and, yeah I reckon it's awesome. Like with a lot of other workshops you can't have music, and you can't have this and that, but here you can.

Several other mechanical tradespeople discussed the influence of organisational support in relation to assisting them with the technical skills required to perform their work. Participant 6 explained the value of receiving additional training to address the barrier of limits with technological skills, discussing:

> With the company I work for now, they are giving us courses on how to use the programs. Which is good, they actually do train us. They are actually putting more into training. So that we can actually use the search functions within our smart phones etc. So, they are putting training into us to learn the new skills.

Both Participant 11 and Participant 14 discussed the benefits of their organisation having access to product technical information in supporting their mechanical trade self-efficacy within their role. Participant 11, a mechanical tradesperson in the agricultural

industry explained:

> Because we're a dealer, we're sort of special, but not special in a way. We have the backup of the dealers, you know I could be working on a, because we do New Hollands, I can work on a New Holland and just jump on a New Holland, and if there's something I don't know, or the spec, and anything like that, and then get off that start working on a Western Star, don't know something so I just go onto the Western Star website, or to the dealer portals.

Participant 14, an automotive mechanic, supported Participant 11's statement, commenting:

> I think it was good in a way that dealerships have a lot better processes on doing things, so everything was probably more organised than just your corner workshop or whatever. Toyota have their own technical help, which is, can be quite useful, so that's an Australia wide sort of network, so if other dealerships are having the same issues, they can communicate and sort of find out what is going on.

An alternative viewpoint to those mechanical tradespeople who discussed the positive nature of organisational support, several participants discussed the need for improved support in workplaces where they noted this was lacking. Participant 13 discussed instances where lack of organisational support had impacted upon both their value and job satisfaction. They spoke of an aviation company where they said, "working in deep level maintenance … I'll be honest I hated it. Absolutely hated it…the people running it didn't run it very well. The management team were a bit isolated from the workforce."

Participant 13 then provided another organisational experience with a different employer that explained this further:

> I've been that guy, that disgruntled guy at different times. At the moment we're doing gun trials, fitting machine guns and multi-barrel guns to the MRH90's so it's, we've

> got engineers from Europe out, we've got guys that designed the stuff here in Australia and they're fitting it all up and working out fields of fire, because they've got a limit when the gun can go, otherwise you start shooting holes in your own aircraft, I got a real kick out of being involved in that, I was involved in that for about three or four days, and then one of the managers said oh this guy is going to be running it, so you're off the crew. It was sort of, well thanks, I've got something, I'm doing something interesting, that I can get my teeth into and you've taken that away from me. And that happens a lot to different people over time. Yeah, it's just, it just disengages people.

Participant 9, who worked for a multilevel government organisation, discussed their observations when they implemented improved organisational support for their mechanical trades team, reporting:

> Definitely not a thanks, our own manager doesn't, he comes over here maybe, once a day you might see him walk past the office, and that's to grab the newspaper and then he's back. He doesn't go around, he doesn't say g'day to anyone. You know he's not, I don't think he's super busy, I've seen the fleet side of things. It would be great to see the manager come over here and show that he cares. Yeah, they don't have that… they don't focus on their staff very much. When I first got here, there was people that, I'm going to blow my own trumpet a little bit here, they'd been here for years and years and years, they'd had no training, no further education, no specialised skills, nothing. So I was like, this has got to change you know, we better give these guys a go or else we're going to lose them, so a few of them have done dogging course, high risk work, truck licences, I've got 12 of us going through TAFE at the moment upskilling our trades. And we're not, every time I've tried to do these, the manager, the Principal tried to stop it, and I was like why, why would you do that? Invest in

your staff and you'll keep them, but they just don't understand that.

Supervisor Support. As discussed, there can be a blurring of lines between organisational and supervisor support in many mechanical trade work environments. Supervisor Support has been operationalised as support by a direct line supervisor, or an employer who is also a direct line supervisor providing technical role related support. This occurs particularly in small business in this work domain and also in relation to the vocational education training environment. Data coded under the Supervisor Support theme, relates to support directly provided by an employer in relation to trade skills, or by a non-employer supervisor as part of their work role.

Participant 14, an automotive mechanic explained "I was pretty lucky, I got to work with the head mechanic for four years, beside him and with him. So, I was pretty lucky there, it was a bit of a mentorship." They then explained the role their supervisor played in assisting them to meet their work targets, providing a buffer between themself and the organisational standards:

> Probably the only thing would be, and this is probably in the dealership side of things, more so than other places, but, your work efficiency and productivity and that sort of thing is very heavily monitored. That probably a lot of, some people don't understand how sort of monitored you are at how fast you're doing things and how long it takes you and that sort of thing. … It can be a bad thing sometimes, there's things that go on that you can't sort of put on a computer screen, it's not always accurate. .. Operations manager he is, slash workshop foreman, no he's not a mechanic, but he does have sort of a relative understanding that things happen, but in saying that, his boss is hounding him to make things sort of run faster and smoother, and make more money, and that sort of thing you know and so, yeah, he's pretty good in general yeah.

Participant 9, a mechanic who also worked in the role of workshop foreman, explained how important it was for them to provide support to the mechanical tradespeople in their team, explaining:

> It's a bloody busy workshop this, very busy and it's pretty stressful at times. The staffing issues here, you know such and such's daughter is sick, they've had a fight with their wife, you know you've got to deal with all the human factor as well.

They related a sense of pride in being able to support their team, around the personal factors that impacted upon their work, indicating "you know one of the mechanics saw me and said can I knock off now, I want to go do this. And you can sort of say no worries" (Participant 9).

Coworker Support. The mechanical trade workers who were interviewed discussed the role of coworkers in supporting their work, in relation to areas such as self-efficacy, work values, job satisfaction, and persistence intentions. When asked what factors assisted them to overcome difficult work days, Participant 1 indicated "usually it's a pretty good atmosphere out there with the boys, we usually have the radio going and not everything is all serious. … the guys in the workshop are good to work with."

Participant 2, who also worked for the same employer as Participant 1, provided a similar response when asked about managing difficult work days, commenting:

> Working alongside Ash and Jordan, our other apprentice. Every day there is something different. There is always something challenging and it's just enjoyable being out in the field with them. … working alongside the young guys. They are probably the best. There is always a serious side to work, but you'll get frustrated and they'll say or do something stupid, and that sort of breaks it all up, you have a bit of a laugh about it, then okay, it's alright. Working along the young guys is definitely the best part of it. … I love it. Yep. I enjoy getting out of bed, knowing that I'm coming to

> work to do something. Every day is different. A different challenge. And yeah, working with the boys, working alongside them.

Similarly, several workers also discussed their differing experiences, working off-site versus on-site in a workshop. For example, Participant 11 stated:

> Being in the workshops good because there's someone to talk to, you sit down for lunch and have a bit of a chat with the boys. … You really need a clown in every team, just to, just to joke and much around and make everyone smile and yeah, it's sort of, you've got to have a happy team to make it work. And a lot of the time you'll be standing two inches away from the person, you know, working under a dashboard, if you've both got the shits with each other, you both hate each other, it just doesn't work.

Participant 12, who worked for the same employer as Participant 11 in the agricultural industry supported these statements, explaining "I get along with all the boys. That's what pretty much keeps me there because I, you get a good like, just kind of second family like you spend more time working with them, then you're at home." Three other mechanics who worked for another employer in the agricultural industry, made similar comments in relation to their positive perceptions of coworker support, including "oh, the attitude of all the fellas, and you're really appreciated with what you do. Just the friendliness" (Participant 17); "yeah, I get along with people, I love learning new things, just the work in general, like you can always have a bit of a joke" (Participant 18); and "it's a good workshop, most of the blokes are pretty good" (Participant 19).

This 40-year old diesel fitter, Participant 8, who was employed within the mining industry, spoke of the value satisfaction that they gained from being able to support their coworkers in their role indicating:

> I don't know, sort of helping other people get, if they're not sure, if they've been

> struggling or that sort of thing. I've been leading hand in the last two years. I've enjoyed that sort of aspect as in people coming to you for advice … You get the good guys that work with, and like I'm still getting calls the guys, giving them references for new jobs and stuff. They're the guys you'd want to work again with.

Again, Participant 9 provided an alternative view, discussing their experience where the type of support was missing in the environment, commenting:

> I've always worked in, where you looked out for each other, got each other's backs, you would cover for each other, you know it was good morale and team work, but that is non-existent here and that's a huge part of morale, pretty much, so the human factor is what I think is the biggest thing

Mechanical Trade Self-Efficacy

Following the conventions for construction of domain specific social cognitive self-efficacy measures (Lent & Brown, 2006b), Table 2 contains an extensive list of mechanical trade terms was drawn from the interview data to assist with developing an Australian measure of mechanical trade self-efficacy based on empirical contextual data.

Table 2

A Summary of Mechanical Trade Occupational Domain Context Terms Adapted for a Measure of Mechanical Trade Self-Efficacy

Mechanical Trade Domain Terms		
Light vehicle	Agriculture	General repairs
Automotive	Automotive	Service
Heavy vehicle	Mining	Specialising
Heavy commercial vehicle	Gas	Fault finding
Heavy duty automotive	Energy	Fix
Heavy diesel fitter	Construction	Diagnose
Mechanical technician	Aviation	Program
Trade	Army	Repair
Techs	Council	Rebuild
Machinery	Industry	Problem solving
Tractors	Business	Design
Headers	Dealership	Maintenance
Bailers	Self-employed	Inspection
Sprayers	Shop	Restoring
Mowers	Farm	Fixing
Machines	Apprentice	Replace
Earth Moving equipment	School-based	Test-driving
Bull dozers	Manager	Modifications
Loaders	Team Leader	Manufacturing
Excavators	Head mechanic	Tools
Trucks	Foreman	Electronic diagnostic tools
Trailers	Supervisor	Computers
Commercial Vehicles	Training	Technology
Buses	Maintenance superintendent	Data
Motor vehicles	Engines	Workshop
Cars	Motors	Field
Performance	Gearboxes	Farm
Race cars	Electronics	Remove
Old vehicles	Electrical systems	On the road
4-wheel-drives	Hydraulics	Travel
Motorbikes	Airbags	Driving
Drift trikes	GPS	Paperwork
Helicopter	Navigation systems	Warranties
Planes	Transmissions	Recalls
Turbine engines	Nuts and bolts	Ordering
Pumps	Grease and oil	Interpreting Drawings
Drill rigs	Clutches	Workshop Manuals
Boats	Fuel control systems	Timesheets
Outboards	Brakes	Safety
Mechanical fitting	Filters	Customer Service
Diesel fitting	Steering suspension	Parts
Equipment		

Sources of Realistic Self-Efficacy. While coding the mechanical trade self-efficacy data, the sources of realistic self-efficacy were coded as themes. Data coded as sources of realistic self-efficacy contributed to a thorough understanding of mechanical trade workers' mechanical trade self-efficacy related to their jobs and occupations.

Vicarious Exposure. By far the majority of mechanical tradespeople discussed ongoing exposure to mechanical work in their childhood, prior to career entry. Participant 1 for example, indicated:

> I was never really a big fan of school, so I spent a lot of time at work with dad … I spent a lot of time when he worked in Perth as a gearbox condition mechanic, so I would go down and spend most of my time there. … Pretty much I was getting involved with what dad was doing. He would show me through something new and then he would give me one to do myself. …Pretty much the whole side of the family is mechanics, so I was always around it. Dad's brother, Pop. Whenever I could go and help anybody with anything, I would take the opportunity to do it.

Participant 2 discussed their pre-career exposure to mechanical tasks through the generation before them as well, indicating:

> Well my dad and uncle used to be in the drag racing scene, so they, became mechanics themselves. From there my dad went into the heavy diesel. My brother he was restoring an old car and that stage, so we were always in the shed. Their colleague, Participant 3 also discussed the role their father played in providing vicarious exposure to mechanical trade skills, indicating "dad had always done it all himself on the farm and I learned most of it, so that's how I ended up there. … I would have been 16 or 17.

Participants described a range of circumstances where they gained vicarious exposure to mechanical trade skills, from farming and workplace experiences through to social

experiences. Both Participant 5 and Participant 8 reported similar experiences in relation to exposure to mechanical tasks through family member involvement in the earth moving and agricultural industries. Participant 8 explained:

> I've basically been working with earth machinery since I was a little kiddie. I basically I got my finger jammed between a bull-dozer blade and a tree I was 10 years old. I have a long affiliation with bull dozers. … I've been around machinery all of my life.

Participant 11, a light vehicle mechanic, who was employed in the agricultural industry, talked about vicarious exposure to mechanical tasks from an early age. They reported:

> I used to work on cars, when I was about 5 with dad. He and another bloke worked on cars, just in the garage at home, like services and that sort of stuff. The other guy was a mechanic, dad used to help him out. So yeah, I've been around mechanical industry I suppose through that side of it, from year since I was 5.

Participant 13, an aviation mechanic discussed similar familial experiences, stating "I'd grew up in an environment where my father, and grandfather, and uncles fixed their own cars, basically did everything themselves, so as a kid I sort of just tagged along and picked things up as I went." Participant 15 reported similar pre-career mechanical trade exposure also, stating:

> My grandfather was a fitter and turner, so he did a lot of mechanical stuff as well. So whenever we went around there, at the time when I was younger, he was building a 43 Huppmobile mobile from scratch … completely rebuilt it. So I grew up sort of doing that sort of stuff as well … my dad was the same, even though he was a shop fitter, he was the same, he was always at home tinkering, changing brakes, changing wheel-bearings, stuff like that, as soon as I was, as soon as me hands were big enough to hold the tools, I was into it as well.

Mechanical trades are by nature, trained through a process of vicarious exposure, combined with formal training. Within the workplace, while undertaking training as an apprentice, mechanical tradespeople gain hands-on training from another more experienced mechanical tradesperson. Participant 2 described their early workplace experiences observing their father, explaining:

> In the beginning it was unusual to be out of school and straight into the workforce. It was enjoyable working alongside dad. So that was good. Once I'd finished my time, and we both sort of parted ways and I went into the transmission trade that's where I really found that I was enjoying it. So out of being a serviceman, doing like general repairs, into specialising in a field, that was really good.

While Participant 5 had mechanical skills prior to entering the occupation, they discussed the process of vicarious learning that they engaged in when they commenced the work, as well as describing the process of training that, as a foreman, their mechanical trade employees undergo. Participant 5 stated:

> When I started in the ag industry, I knew that there would be areas that I would have to work hard to bring my knowledge up… a lot of it is on the job training. If I have an apprentice come through, I will try and get a broad spectrum from all mechanics, I won't just try and affiliate them with one, you try and you know get different experience, because some people have bad habits. So yeah, you're always trying to mix and match level of experience. Pick up good habits, probably not the bad habits.

When moving between the mining and construction industries as a diesel fitter, Participant 7 described their process of transferring their knowledge between industry as one that they observed had benefited others as well. They spoke of:

> Asking people, I've never been afraid to ask. Being a leading hand last two years I've noticed guys that come and ask you the question when they don't know actually learn

> better than guys that will pretend to know. So more or less just asking questions and researching and picking people's brains that have actually done it before.

Within the automotive industry, both Participants 14 and 15 described the process of developing their mechanical trade self-efficacy through observation of more experienced mechanical tradespeople. Participant 14, who was employed within a major automotive dealership stated, “I was pretty lucky, I got to work with the head mechanic for four years, beside him and with him. So, I was pretty lucky there, it was a bit of a mentorship.”

Participant 15 reported a similar experience, indicating their capacity to receive broader exposure to a range of mechanical areas informed their choice of employer. They stated:

> Where I worked it was a small workshop out in the country, it was just me and the boss, I’ve done everything from tractors to heavy buses and trucks, to boats to outboards, I’ve done everything … like my boss he started when he was 16 his apprenticeship, he’s in his early 60’s now, he’s been in it a while, he’s owned a few different businesses through specialists, through just general workshops, he’s worked in agriculture and all that as well, he had a lot of knowledge which another reason why I wanted to do it in a place like that, because the people that do work there normally have been around and they have a lot of knowledge that they can hand on to you. So a lot of my knowledge I did get from the boss, especially the older cars and stuff like that.

Participant 17, a 63-year old heavy diesel mechanic, discussed the process of vicarious exposure as a learning tool in the early days of their mechanical training. They stated:

> It was interesting and I suppose the fellow that I worked with, taught me a lot by example. Like they weren’t very good teachers, you had to watch them. They couldn’t

> tell you how to do it, but they could do it. I suppose I'm a bit like that too, I'm not the best at telling someone how to do it, I just show them how to do it.

As a relative early career mechanic, Participant 18 discussed how observing more experienced mechanics, either assisting them with their tasks, or just observing their tasks, assisted with their skill development as a mechanic in the agricultural industry. They commented:

> Yeah, they come and show me stuff, and when I ask for help you know. Yeah, you always ask questions, you know. On what they're doing even, you know you just walk past even and they're on a different job, oh yeah, what are you doing there, rah, rah, rah. But if you don't know that they're doing, if it's something like with air-con, you know a bit about it but not a great deal.

Of note, even experienced mechanical tradespeople discuss the ongoing process of vicarious exposure as a source of self-efficacy within the workplace. In addition, many of the participants discussed not only self-efficacy development through their observations of others, but also, the process of interaction with other tradespeople. A simple example of this process is the response provided by Participant 1 when discussing problem solving within their role, they indicated "yeah, I do enjoy it. It's good to find things like that and be able to pass it on to someone else."

The helicopter technician who was interviewed also discussed this process of vicarious learning within the aviation industry. They explained:

> As time moves on, and you progress, and as your skills come up, instead of being the student, you start becoming the teacher. … You become the engine guy and if anything goes wrong with an engine, you're the go to guy, but then you pass it onto the next guy that's working with you. Okay on that course, I learnt this this and this, and when that goes wrong, that needs to go there, or you need to watch for this. You

> pass that on to time, then next time he does that job and his trades person is working with him, he'll pass that on to the next person. … companies need to offer more, career or trade based training, just to lift, to allow people to become subject matter experts, because the workforce will win out in the end, because those guys come back and they'll pass their knowledge onto others (Participant 13).

Similarly, several participants explained the need for teamwork in order to develop their mechanical skills vicariously. For example, in the agricultural industry, Participant 2 stated:

> It's an ever-changing deal with the tractors, with the electrical side of things. The schooling, it could be better … with faults, we all tend to work together, it makes life a lot easier. … A lot of the times with electrical, say on the Fendt tractors, you need two techs to go out. You'll miss something, or they'll miss something, or they've seen something before. It's not until you're out there at the tractor, that oh, we've seen this once before. So you really need two techs which is pretty hard, because some of our tractors are three or four hundred k's away.

Personal Performance. As discussed, the majority of mechanical tradespeople interviewed described having had vicarious exposure to mechanical trade tasks prior to career entry. In considering this, they also often discussed associated personal performance opportunities provided them by significant others. Participant 8, a diesel fitter with additional engineering specialisation indicated:

> Basically, because I've always done it. It wasn't a big issue. Yeah, ever since I was a little fellow I was always pulling apart a lawn mower or fixing this or fixing that. … to be a good tradesman, you really, it comes back from that, where a little tacker pulling apart a push bike, pulling apart a mower, pulling apart a whatever, and putting it back together just because you have that inbuilt curiosity for what makes it tick.

Similarly, Participant 5 spoke of their pre-career experience with motor vehicle mechanics. They said, “building my first car when I was 17, I got a fair bit of experience, just with actual mechanical working of things.”

Participant 4 described the need to move from vicarious exposure to personal performance when they were ready to start driving with their friends and didn’t have the money to pay for a mechanic. Participant 4 said:

> I wanted to go racing, or like back in the day you couldn't get a loan to get an expensive car, so you had an old bunkey and you were always fiddling around a little because they were always breaking down and shit was falling off it and stuff.

Participant 1 reported:

Pretty much I was getting involved with what dad was doing. He would show me through something new and then he would give me one to do myself. I thought that if I put my mind to it I could definitely do it.

In a later interview, Participant 1’s father, Participant 2, explained that they had provided their son with the opportunity to rebuild a vehicle engine as a personal performance test as such. Participant 2 spoke of this experience, saying:

> He had an old Patrol at home. And he said, he must have been 11, he said I want to be a mechanic. I said, no. But no. He said, I want to be a mechanic. And I bought him a motor for their Patrol and said if you put that in there, we'll talk about it. And yeah, he did.

Participant’s 15 and 19 described similar experiences, with Participant 15 indicating:

> I grew up sort of doing that sort of stuff as well … as soon as me hands were big enough to hold the tools, I was into it as well. … like I always wanted a 4-wheel-drive, as soon as I got my licence I got a 4-wheel-drive, being able to work on it and fix it and get it to the point you want it to. And then same with like helping out my

> family, working on all their cars, keeping all their cars up to scratch, safe and all that sort of stuff. Um, and those were that main things that sort-of, sort-of pushed me into in.

Participant 19 described:

> I bought my first car when I was 12 … I grew up in Proston, it's pretty small, so, my brother's godfather, one of dad's best mates was a local mechanic, you know there's only two garages in town and I spent most of me time running around there, fixing motorbikes and whatever I could get to with an engine.

While the majority of mechanical tradespeople spoke of having personal performance experiences in the mechanical trade domain prior to career entry, they additionally spoke of the relevance of personal performance as a source of self-efficacy in the workplace. This related both to learning during early career stages, as well as personal self-efficacy during maintenance stages of the occupation.

Participant 1 discussed the sense of enjoyment they gained through their hands on work as a mechanical tradesperson, indicating:

> I just love being able to, a bit of fault finding, being able to pull something apart, see how it works, put it back together, the variety of stuff you get to work on. …When I read, most of it doesn't go in. It's a lot easier when you're actually working on the stuff, or looking at it physically, rather than reading it out of a book.

Other participants also discussed a similar experience regarding the development of mechanical trade skills, making statements like "the learning kind of starts when you start doing" (Participant 13) and "you can gain your skills while you're actually working, which is a big thing" (Participant 17).

Working in the agricultural industry, Participant 4 discussed the development of self-efficacy as it related to increased experience and personal performance. They said:

> Yeah, but it's like then once you do know that, once you get that reoccurring problem, and someone rings up and says it's this, this and that, you go, I know what that is and go. You grab the part off the shelf and go and fix it. Whereas when it first happens, you're sitting there scratching your head.

Participant 12, a 23-year old diesel fitter working in agricultural and heavy machinery described the development of their confidence within the workplace, they said:

> I was a bit iffy I guess at the start, because I'd only done basic grease on mates trucks and like you know lots more that, then when I started, when I first started I was just doing basic services and then within six months I was popping clutches out, gearboxes out, replacing clutches. … I worked my way up, and then done that, so I went and done the basic mechanical knowledge I guess you could call it. And then you went to the bigger stuff.

Participant 15 discussed the value that working in a regional workshop provided them, in terms of the broad range of trade experiences they would encounter. They reported Within two weeks I was already rebuilding engines. … where I worked I got a look into like problem solving, electrical, re-wiring stuff, we did like, brain's just gone blank, manufacturing, like metal work and stuff, like we made bull-bars, rear-bars, side clips and all that sort of stuff. … having that broad range is something I wasn't really expecting, I was thinking oh yeah, I was going to be doing mechanical stuff, you know you'd be changing brakes, changing filters and maybe doing the odd engine rebuild, or something like that. Not all this other stuff as well, which has been really good.

Having worked in the automotive industry for a significant period of their career, Participant 19 displayed confidence in their mechanical trade skills, indicating:

> With what I'm doing now no, it's very straight forward and I know what I'm doing. I've been doing it for 20 something years, so you know, what we're doing with the light vehicles is, it's very straight forward and I know it inside out. I know my job.

Taking into account growing confidence with exposure and increased opportunity for performance, Participant 16 added:

> Some of the things you don't work on too often, you could get the chance to work on them more, and like a bit more knowledgeable in them, and a bit more competent in the work rather than sort of, you second guess sometimes and take a bit longer to do things because you're not entirely sure. But when it comes to stuff I've always worked on, you're fairly confident with your answers and that it'll work straight away.

Positive Affective States. During the interviews, many of the participants described having experienced positive emotions in relation to mechanical trade tasks prior to their career choice and entry. Participant 1 provided a clear example, stating:

> So I fell in love with mechanics from a really young age and so I knew what I wanted to do. … I just really enjoyed doing it. Yeah, it sort of gave me something to look forward to I guess. I've always grown up around working on cars and what not. Yeah that's just what I wanted to do.

Similarly, Participant 18 explained "yeah, I love it. It's what I always wanted to do, since a young fella, so. I enjoy it." Several mechanical tradespeople spoke of early interest in the trade, including Participant 3, who stated "I had always been interested in mechanics and dad had always done it all himself on the farm," while Participant 4 stated "I've always been, ever since school, like I wanted to be a mechanic." Participant 16 also discussed the influence their father had on their affective experiences with mechanical work, explaining "dad had a lot to do with it, he's always done that sort of stuff, mucking around with things on the

weekend, I always really enjoyed it, I probably got my interest from there I would suppose you say, yeah."

Participant 5 spoke of interest as well as passion for mechanical trades following early exposure, they indicated:

> It was something that I had always been interested in, farming industry, mechanics per se. … I was 17 when I first built my own car, which was a 58 Holden. So that was probably … the start of the passion. … you listen to those stories, and if that, if you've got any inkling inside you that that's interested, it just transfixes you and you just begin to love that type of thing.

Participant 6 discussed the role that their enjoyment for mechanical work played in their initial career choice, indicating:

> I was at school, I had a few offers of different other trades like building, plumbing, but I liked mechanical because it interests me and I live in a town that has a lot of work in that field. And I enjoy that sort of work you know.

Similarly, Participant 13 discussed the role that their enjoyment for mechanical work played in their choice of aviation career, reporting:

> I had a think about what I was good at, what I enjoyed, I'd always enjoyed doing mechanical work on cars and stuff like that, I'd had an interest in aviation as a kid and wanted to be a pilot, but didn't get very far with it, but yeah, ah put the two together.

For many of the workers interviewed, they continued to experience positive affective states in relation to mechanical tasks when they entered the occupation. As Participant 2 explained:

> In the beginning it was unusual to be out of school and straight into the workforce. It was enjoyable working alongside dad. So that was good. Once I'd finished my time, and we both sort of parted ways and I went into the transmission trade that's where I

> really found that I was enjoying it. So out of being a serviceman, doing like general repairs, into specialising in a field, that was really good.

From their early career experiences, to their experience over 30 years later and now working in the agricultural industry, Participant 2 further explained:

> I love it. Yep. I enjoy getting out of bed, knowing that I'm coming to work to do something. Every day is different. A different challenge. … I just love being able to, a bit of fault finding, being able to pull something apart, see how it works, put it back together, the variety of stuff you get to work on. … I do enjoy it. It's good to find things … and be able to pass it on to someone else … I enjoy doing the gearboxes and engines and things like that … I enjoy the work.

Also working in the agricultural industry, Participant 5 spoke of their enjoyment of their occupation, indicating:

> It's all good. I love what I do. And I think you need to be passionate, and if you're passionate about what you do, you're halfway to succeeding.” With similar passion for their work, Participant 6, who worked in the mining industry indicated “with the extra stuff that we're getting to do in the industry that I'm in now, it’s so much more diverse than being in a workshop. I love my job at the moment. It's one of the best jobs I've ever had and I can't see finding another job better.

Participant 13, who worked in the aviation industry described strong emotional states in relation to their role, explaining:

> Yeah you get that bit of a kick out of it. People talk about perceived pressure and actual pressure, like a little bit of actual pressure isn’t a bad thing. We had a, Monday morning we pulled an engine out of a helicopter that was in the training school, and brought it over to our hanger because we had an aircraft with a bung engine. And the flight line coordinator said okay boys, I’ve booked the test flight for this for 2 o’clock

> this afternoon, so old engine out, new engine in, all connected ready to run, and yeah, all of us got a big kick out of it when it took off and flew at 2.15. And now it's out flying around everywhere. … I found the engine that was broken to, which sort of was like a little bit of a buzz there. Pilots complained about an issue, a couple of caution lights, went through found it was starting, the internals, the oil pump was starting to fall apart, shrapnel all through the engine, it probably would have hand grenaded if it hadn't have been caught.

Verbal Persuasion. Several participants discussed the role of verbal persuasion in developing their confidence for mechanical trade tasks prior to career entry. Participant 6 and Participant 7 were brothers, whose older brother, father and grandfather were all mechanical tradespeople by occupation. Both spoke of the role that these influences paid in their career choice, with Participant 6 indicating "I had Daniel, which, older brother, in a trade, he had already done that five years or six years previous. So, it gave me a lot of heads up on what I needed to do at school and to achieve." Participant 7, stated:

> More or less my father said have something to back you up. I was more into tourism and hospitality at school and started sort of looking toward the chef way, but nothing really there and the times that you worked didn't really favour you. And dad talked me into applying for an apprenticeship as a diesel fitter, so that's how it started. … More off advice, that the work was going to be there for the future.

Participants 2, 9 and 16 also spoke of the role their parents played in persuading them to take up a trade, with Participant 2 indicating "I was about 13 and that's when it sort of started. I was offered, would you like to carry on the family trade. I was just over 14 years old when I left school and slipped straight into an apprenticeship." Similarly, Participant 9 explained:

> I'm one of 12 kids, all of my sisters went and became teachers, and all my brothers

> joined the army pretty much. It's a bit of a family thing, the old man's in service as well. But I was always going to get a trade through the army. I wasn't going to go to the army and not get anything out of it, and mechanical trade was the one that interested me the most.

Participant 16 reported a similar familial persuasion experience, indicating:

> I always enjoyed it, and mum and dad were like, well you've got to get a trade … They sort of said that to all of us, all my brothers, my brother and two sisters … that's what they wanted us to do, they said either you're going to Uni or you're going to do a trade.

Participant 15 discussed how they were not only persuaded by their family, but also their friendship group to take up a mechanical trade. They stated:

> That's what everyone was sort-of saying, and I at, from the get-go I could, knew like I was going to do a trade, like I could do whatever I wanted to after that, but like, I was never going to lose that trade, that knowledge that I obtained, so I could always fall back on it if anything went wrong, or I just needed money quickly or whatever, I could fall back on the trade and get a job.

The role of verbal persuasion in maintaining mechanical trade self-efficacy in the workplace was discussed by several participants. Participant 2, was an experienced heavy duty diesel automotive transmission trained mechanic, who worked in the agricultural industry. They discussed the role of discussions regarding mechanical trade tasks between mechanical staff in their team. They explained:

> A lot of the times with electrical, say on the Fendt tractors, you need two techs to go out. You'll miss something, or they'll miss something, or they've seen something before. It's not until you're out there at the tractor, that oh, we've seen this once before. So you really need two techs which is pretty hard, because some of our tractors are

> three or four hundred k's away. But yeah, we work in a team here as much as possible. We sit down and discuss before anyone goes out. … Chris is our head mechanic, but he also looks after parts. So when we're busy, he's out in the shop, otherwise he's in here looking after parts. He's been with the company 30 odd years, so he knows the place. And he knows how they work, so when we get stuck, we come and see him.

Participant 4, who was also a heavy duty automotive mechanic employed in the agricultural industry discussed the role, not only of formal education and training in developing mechanical trade self-efficacy, but also the role of verbal interactions between other mechanical tradespeople working in the same industry. Participant 4 explained:

> Yeah, once a year, or a couple of times a year, I go across to Perth. I've been to Melbourne a few times for different bits of pieces. Over the other side it's all Melbourne based, the training is over there, so it's easier for them. I've done one AGCO course in Melbourne, I've done the rest of them over here … it does help, because they're always updating stuff and changing stuff, and not really telling you when they do change stuff. And you get over there and get to speak to all of the other mechanics and that, and you know, you talk about problems that they've come across and see the patterns of what fails all the time, and what doesn't fail and that sort of stuff." Participant 4 explained that these verbal interactions, either in the training environment, or over beers at dinner that night, assisted their confidence in relation to their capacity to problem solve within their job.

Participant 5, also employed within the agricultural industry, discussed similar knowledge sharing experiences in relation to mechanical trade skills and tasks related to the role. They stated:

> There's pretty much something happening in there all of the time. And that's what I said about the knowledge that I need to impart to other people. Look, it's amazing the

> phone calls that I get from other branches, because I've been around, hey Bart's, how do I fix this, or I've got this tractor doing this, and that's one of the biggest problems, is they haven't got staff that have been around for long enough. You know, there's not, hasn't been enough continuity in branches that are out in the bush because they can't keep staff. Who wants to fucking work out there, unless you're going to get a farmers' son, and he going to do his job and fuck of back to the farm. And you know that, so those dealerships that more remote from us, have a hell of a lot harder time keeping staff.

Participant 5 discussed the role of verbal persuasion in building the confidence and capacity, not only of their staff, but other mechanical tradespeople within the dealer network. Having changed mechanical fitting roles from the mining to the construction industries, Participant 7 also discussed the role of verbal persuasion in developing their confidence with their capacity to undertake the tasks within the construction industry. Participant 7 stated:

> It was a challenge going from diesel fitting where your hands on dirty all day, to mechanical fitting where it was interpreting drawings. Which I had no experience on, but picked it up pretty quick just by asking people that knew, engineers and other guys. … Asking people, I've never been afraid to ask. Being a leading hand last two years I've noticed guys that come and ask you the question when they don't know actually learn better than guys that will pretend to know.

Participant 7 also discussed how they perceived their willingness to develop their mechanical trade self-efficacy through positive verbal relationships with their colleagues lead to their promotion to leading hand within their role in construction. Participant 8, who had also worked in the mining industry, discussed the importance of collective verbal influences regarding the capacity and confidence of mechanical tradespeople within their roles, explaining:

> The beauty of that, if anything goes wrong … there is a brains trust … that they know exactly what's wrong with it, and then they can talk with different mines who've got them and say, we've come across this, this is what we've found, bang." Participant 11 discussed similar experience of access to collective knowledge within the dealership where they were employed, stating "if there is an issue, you just look on the computer, or talk to someone else and scan sort of figure it out.

Participant 13, an aviation mechanic also discussed their experience of verbal persuasion and collective knowledge transfer stating:

> You become the engine guy and if anything goes wrong with an engine, you're the go to guy, but then you pass it onto the next guy that's working with you. Okay on that course, I learnt this this and this, and when that goes wrong, that needs to go there, or you need to watch for this. You pass that on to him, then next time he does that job and his trades person is working with him, he'll pass that on to the next person.

Participant 13 placed value on this process of pure mechanical trade skill development within trade roles in their workplace. Participant 16, a 23-year old heavy diesel mechanic discussed the role of verbal support from their supervisor and peers in relation to developing their mechanical skills across a broad range of equipment, after having worked in the occupation for 6 years. Participant 16 stated:

> If you need a hand you just ask, more or less. The boss likes to have things run by him most of the time too, so you might need to double check with something, how he wants it done specifically and that sort of thing too, as well, but um. Yeah, it sort of, if you need to know you ask usually, there's always someone around who can help.

Their peer, Participant 18, an 18-year old apprentice heavy diesel mechanic who had worked in the occupation for 2 years provided similar feedback stating:

> I usually call one of the boys and just say hey, what would be the easiest way to do

> this… Yeah, they'll show me, and yeah. Show me, or ask me, you know, what have you tried to do? And then, I just tell them, like yeah, well if you keep doing that and just go with this and just give you a little leeway onto it, to get it done yeah.

Participant 19, who was returning to the mining industry after working in the automotive industry discussed the added complexity within the mining role and the need to gain verbal support from other experienced mechanical tradespeople in order to undertake the full range of duties in their new position. Participant 19 explained:

> When you're on the rigs, I'm not too proud to pick up a phone and ring someone when I'm stumped, and you get times when you're stumped, especially with the hydraulics, you know multi-system hydraulics, you know, they run on computers and that sort of stuff, it's all pretty full-on. So yeah, I don't, I have to ring up whenever I get a problem I can't fix, I just ring a hydraulics person or whoever I need, mostly it's hydraulics.

Outcome Expectations

Data coded as participant values related to ability utilisation, achievement, advancement, autonomy, compensation, coworkers, responsibility, security, social service, social status, supervision, variety, and working conditions provided context around the domain specific outcome expectations of mechanical tradespeople in relation to their occupation.

Variety. The mechanical tradespeople discussed the value they placed on experiencing variety and diversity in their tasks and work environment. Participant 10, who worked for a local council maintenance fleet, discussed the positive side of working on a diverse range of equipment, from mowers through to trucks and tractors, he indicated "it's challenging and that's actually a good side of it, especially here, if you don't know what job you're going to get, from day to day."

Participant 16, who worked on agricultural equipment and heavy vehicles reported:

> The variety's good, the variety, it's never just the same thing, the same sort of stuff, it's a lot of old gear too, which is nice, not just to be working on, you actually get to get in and fix it and repair it, not just general servicing, so the full range of hands-on stuff I guess. We get some wilder stuff come through here and that's probably my favourite part of it.

Their colleagues, Participant 17 and Participant 18 supported these statements, linking their job choice to their need for variety, indicating:

> Yeah, that was one of the main reasons I came out here I guess you would say, there was more hours and more work, and there was a better variety of work on offer, it was exactly sort of what I was looking for yeah. Oh, the variety. We get a very good variety here (Participant 17); and,

> Everything's different which is a good thing, you're learning a lot about different varieties of vehicles, you're not just like, at a dealership you only learn about your one sort of tractor and all that sort of stuff, and they're all pretty much, they're basically the same. The variety's good that comes through, you get lawn mowers, to cars, to trucks, to tractors, to dozers, all your heavy machinery, yeah, no, it's good … this job is better because it has variety (Participant 18).

Participant 2, who was also employed in the agricultural industry, discussed the benefit of variety within their job, stating:

> Every day there is something different. I enjoy the bailers. …There is always something challenging and it's just enjoyable being out in the field. … We cover a fair and vast area. Every day there is something different. It's good. … I love it. Yep. I enjoy getting out of bed, knowing that I'm coming to work to do something. Every day is different. A different challenge. And yeah, working with the boys, working

alongside them.

Participant 4 was also employed as a mechanic in the agricultural industry. Their work role included service work, both in a workshop and also, on farming properties within several hundred kilometers of their workplace. Participant 4 discussed the positives of work variety, indicating:

> It's good, like you meet a lot of people, because I do a lot of mobile stuff … it's something different every day you know … there's a lot more happening in the ag industry, that you need to be aware of, than a normal motor industry I believe. I believe the ag industry is the most diverse industry that you'll get in any sort of form of mechanicing, because you have electronics and hydraulics, electronics over hydraulics, you've got engines, you've got transmissions that are cutting edge technology, so it is so diverse.

Similar to Participant 4's experience within the agricultural industry, Participant 6, saw benefit to the diversity of their work role in the mining industry, stating:

> With the extra stuff that we're getting to do in the industry that I'm in now, it's so much more diverse than being in a workshop. … It's rewarding as such that I do get to work on a lot of different kit, so that's, that's fine in itself.

Participant 11 provided a diverse perspective of daily variety within their work role, discussing not only task, but additional location variety offered within the workplace as impacting upon their work satisfaction. They reported:

> I find doing the same job over and over again really boring and that is the one thing with it, you know some days you just get a run of change oil, change oil, change oil, change oil, change oil, all day long, everyday for three weeks straight and by the end of it, it's really, look for me anyway, it really sort of gets you down and you're like no, I'm over it, I'm better than this. And other days you get, or other weeks, you get

> four or five clutches in a row, and then you're over that. So, I find that if you can do a service, then a clutch, then go do tractor work and then go and work out an electrical problem, it's really great. If you can get into the role of, or get into the routine of different jobs all the time, it's really really good. If you just do the same job, over and over and over and over and over again, it's yeah, it gets a bit boring. And I've found, I've worked in dealerships and for smaller guys, and in a dealership role you do get a lot of service work. Whereas in a smaller environment you sort of get a few more different jobs along the way. Yeah, I like it now, I love it. Yeah, as I said, because I'm like, from day to day it's very different. You know, I'll spend two days in the workshop on trucks and then it's like righto you're off to Bundaberg, so yep, in the car, you're in Bundaberg all day doing tractor stuff. You just come back, and then you're off to Gin Gin the next day for more tractor stuff. And on yeah, you're back in the workshop because it's Friday and you're having an easy day. … It's really good. At the moment I've got the best of both worlds. So, which is good, I would prefer not to be in the workshop, me being me, I'm over the workshop scene, um yeah, so.

While referencing the need for variety within the workplace, Participant 13 discussed an experience where their job satisfaction was impacted upon by lack of variety within their work role. Employed in the aviation industry, Participant 13 indicated:

> The thing that I hated about the deep level maintenance at QANTAS, partially was that the team leader that I had, he liked, you know like doing wings, each crew had a section of the aircraft to work on, and we did left wing all the time. And for whatever reason, he just liked it that way, and it was just the same sausage factory day in, day out, no variety. You've got to mix things up, let people do the odd trip, and get involved in interesting stuff, just to keep you engaged and keep you interested.

Participant 15 linked their need for functional variety with choice of employer in the

automotive industry. They sought to reduce the barriers associated with the physical demands of the occupation, stating:

> For example if you work in a dealership, you get a recall, like the big airbag recall they're having at the moment, you know like bending over under the dash all that sort of stuff, like you're doing probably 10 cars in a day exactly the same thing over and over again, well yeah, that would start to kill your neck, kill your back, that would kill you physically, which is the same again. Which is why I was working sort of where I was … a smaller workshop. Um, you don't get sort of stuff like that, like we might have a one-off coming in, but it's not like, we're not doing ten of them in a day, so you sort-of you do that, you get up, stretch around, walk around, do something else, you've sort of got the variety.

Compensation. Most of the mechanical tradespeople who were interviewed discussed the value of being paid well, to have a comfortable lifestyle and to be compensated well for their works efforts. Participant 1 discussed the security that their developing occupation had provided in terms of his ability to purchase their first home at 24 years of age, stating:

> I've bought myself a house. We lived back in Perth, everything was so expensive and the thought of buying a house down there was gone. So, when I finally saved up enough to get a house deposit down and did that it was pretty exciting. I wasn't expecting to do it. As your knowledge gets better on the equipment that you work on, so does your pay.

When asked about the factors that promoted their retention in their current workplace, several participants discussed the value of compensation. Participant 4 stated "you got to get paid. Basically yeah you got bills to pay," when asked about the factors that kept them working in their occupation. Participant 11 said "we're well paid," while their colleague

Participant 12 stated “they pay above award wage and all that type of stuff” when discussing positive factors within their work environment.

Several workers discussed the value they placed in their belief that long-term the occupation would provide for financial security and skill transferability in relation to their early occupational choices. Participant 3 stated:

> I was guessing at the time that it would give me a good grounding if I did go back to the farm. I ultimately said to my boss when I did it, I said to the boss, I'll give you six years and see where it is from then. Then obviously that got forgotten, and the pay went up and I got a bit more encouragement to stay there.

Participant 3 discussed the role that compensation ultimately played in their employment retention with their current employer. Participant 13 had been working as a taxi driver, prior to choosing to undertake a mature age apprenticeship as a helicopter technician. They reportedly linked the choice of occupation not only to their interests, but their value for compensation as well, they stated:

> I wanted to earn a decent wage as well, money is important. Money has a little bit to do with it. We’re paid very well for what we do. Um, to be honest there would be very few jobs where I would be paid as well, do to what I do, well to be blunt, to do as little as I do.

Participant 7, who worked as a fly-in fly-out mechanical technician remote Australia made the connection between their need for compensation, as it related to the consequence of working away from their family for years. They stated:

> End of the day most times it comes down to the coin that comes into the bank account. That's the main thing that keeps you going. The last two and a half years I've been probably on the worst roster for family. Being a four and one roster being over the other side of Australia. I found that quite difficult, probably would never do it

> again. But it was just a main goal to get some money and get ahead in life and then sort of relax and reap the benefits of doing it for that short amount of time. … Being away a lot, but also reaping the benefits of getting a good pay and getting ahead in life. I'm 40 now so I can cut back a bit now and don't have to go looking for those big jobs. So I more or less worked out that I've had 15 years in the industry, it's got me to where I am comfortable. So the next 15 years work is going to get me to where I want to for retiring. Sort of my goal I've got now.

Their brother, Participant 6, also a mechanical technician discussed the role of compensation in relation to remaining with their current employer in shift-work gas mining operation, stating "for what they pay us. The pay is, you're not going to get that outside." Participant 9, who was previously also employed in the gas mining industry discussed the role of compensation as well, stating:

> Yeah look, the wage was a good thing. I just did it because it was there to do, the rigs, the fly in fly out. It was big money, I think I was on about $165,000 was my base when I left.

Participant 19, who was employed in automotive at the time of their interview, reported that they were not persisting in this industry due to concerns about limited earning capacity compared to their previous employment in the gas mining industry. Participant 19 reported that they had accepted a new position in the mining industry:

> Because I'm, I hope I'm reasonably good at what I do, word got around that I was working in town and they called me. And it's more than twice what I'm getting to back to the rigs, so it's worth 120 grand per year, as opposed to 58. So it's a no-brainer mate hey, and you're only working 6 months of the year, you're doing 2 on 2 off roster, so, you know.

Conversely, several of the mechanical tradespeople employed within the automotive

industry discussed their concerns with limits of the industry to meet their compensation needs. Participant 15, who had worked in the industry for 6 years, stated:

> Um, something that is, that you also sort of not expecting, at the time, is the money that's in automotive industry is very very poor, considering the amount of knowledge that we do have to know across the board, like, as I said I haven't looked at all the other trades, personally I've spoken to a lot of tradesman as well, and in the automotive industry you need to know the most, you need to know and retain the most information of all the trades, and like the stuff that we're doing if we make a mistake, it could cost a life, it could cost three lives, like a car could go through a house, or something as opposed to like other trades where 9 times out of 10 it's just their own life at risk. We get paid the least amount out of all the trades, even though we are technically at a higher risk level than everyone else. So that is one thing that you're sort of not expecting, the money's very very not good.

Participant 19, a 44-year old heavy commercial vehicle mechanic discussed their concern with the compensation within the automotive industry. He had just resigned from the automotive industry, indicating:

> The money's just not there. So, I'm a, you know, I think, I didn't earn 60 grand last year, and when you're paying for my house, but then I'm paying for my daughter as well to go to uni, so, yeah I'm going backwards. That's why I've decided to pull-the-pin. I've sat down and worked out that with this other job, and twice the income, I can double my house repayments and have it paid off in 11 years, I can add, an extra big chunk into my super.

Working Conditions. A comfortable work environment is operationalised under work conditions for mechanical tradespeople. Beyond financial compensation, mechanical tradespeople discussed the value they placed on the additional working conditions that their

job provided them. For example, Participant 6, who worked in the mining industry, discussed:

> What the job gives back to me and my family. … what the job gives back to my family as far as time off, wage, that sort of stuff, you can't complain. I work an even time roster. And when I when I leave home, I leave home at five and I don't get home until seven. But that's only 14 days out of 28. So even though they're long days at work, you get better time at home yeah. I don't really want to change that at the moment, because I've got the shift, I've got the days, I don't do nights at the moment, which is a good thing.

Their brother, Participant 7, also discussed the value they placed on their working conditions, above and beyond the wage. Participant 7 indicated:

> If I go back into the mines the even time roster, the seven and seven roster is sort of more up my field. So if you have one week off, you've got a three week holiday three times a year. You seem like you have a lot more time off doing that roster.

Participant 9, who had previously worked in a mining environment discussed the value they placed on working conditions, to the extent that they had left a position paying almost double, to increase the time they spent with their family. Participant 9 explained:

> I might go back to the rigs or something later, but then there's that family life thing. I like at the moment, being with my kids every morning, I'd miss that too much … We have discussed going back, the possibility, for more money, but I don't think it's worth it. You know that hour in the morning with the kids is probably worth more than the extra 10 grand a month you'd probably be getting out there or whatever. Because it was big money, I think I was on about $165,000 was my base when I left and then I've come here to about $73,000.

As with Participant 9, Participant 11 also discussed the value they placed on working

conditions that suited their home life. Participant 11 stated:

> It is good, I am close to home. It's one of the perks to the job, that I'm home every night. Sometimes it a late night, but I'm home every night and leave from home every morning. Whereas if you go to the mines or something like that, you're away for two weeks and home for 4 days or something like that, whatever the roster is. Um, yeah it's good.

Participant 14 also discussed the value of their work conditions around minimal impact upon their life outside of working hours. Participant 14 indicated:

> Pretty well, um, it's all organised that everyone can go home on time most days, and sort of not being a manager and that sort of thing, I get to come home and not have to think about things at work. So, it doesn't take over your personal life too much.

Security. Several of the mechanical tradespeople interviewed discussed facets of security and comfort, relating to the need for steady employment and the ability to provide for their family. For example, Participant 5 stated:

> I've got a wife, I've got a family, I've got a nice house, I don't own it, I'm still paying for it, why would I want to go anywhere else? And not only that, but you start going through recessions and where does your high end performance go? That's one of the first to go, the first thing that drops off. My philosophy on life is pretty simple, is to live you have to eat, and who provides our food, it's farming. Farming is always going to be there, it's going to go through it's ups and downs. So that's our end goal at the end of the day, if my workshop is profitable, and Matt and Emma run the back end of the business right, I've got a future. I'm going to get paid. Ag industry, I think it's the place to be.

Participant 6, who worked within the mining industry, discussed how their need for stability and security changed once they started a family, indicating:

> I never thought I'd have a permanent job, I always thought I'd always do shut downs and just dribs and drabs. But starting a family sort of changed all that and then you start, then you start looking for the permanent work. So, as I matured I sort of, my goals and that sort of stuff changed.

Participant 7, who also worked in mining discussed the security of work within the industry, stating:

> The work was going to be there for the future, if you wanted to make money, it was always something that you can fall back on too. … I've never had trouble picking up work ... In other industries you're always sort of looking a bit harder to find work and you have to be the best to get a good job.

Participant 13, who worked in aviation, discussed their choice of employer based around the security of employment. He described initially having been interested in commercial aviation, however noticed the industry was disrupted by global events like terrorism and health events like the SARS virus. He discussed their choice of mechanical trade role in the military as a secure choice. As Participant 13 explained "if there's a natural disaster or a war, there's more military flying and it's government work, so, to a large extent it's guaranteed."

Participant 15, a 23-year old automotive mechanic reported that they considered the security of their occupational choice and long-term skill transferability when commencing work as a tradesperson. He indicated:

> From the get-go I could, knew like I was going to do a trade, like I could do whatever I wanted to after that, but like, I was never going to lose that trade, that knowledge that I obtained, so I could always fall back on it if anything went wrong, or I just needed money quickly or whatever, I could fall back on the trade and get a job. It's never going to go out of fashion, you're always going to have work, it's always going

> to be, well yes, the information and the technology updates, you've got to keep up with it, but um, you know, you're never going to lose that knowledge.

Ability Utilisation. Several of the mechanical tradespeople interviewed discussed the role of ability utilisation in meeting their need for achievement within the workplace. The preference to complete tasks that made use of ability was clearly discussed amongst several workers. Participant 15 discussed the need to gain employment that made use of their ability, not only in the workplace, but additionally, that their ability could be utilised out of the workplace to assist their family with their vehicles. He indicated:

> I tossed that up when I was looking for somewhere to get an apprenticeship, I tossed up whether, because I had an offer to go to a dealership, work at Toyota … I was sort of sitting there sort of going, it would be good, it would be easy, you know it would be sweeping floors for the first two years before I touched any tools, I sort of thought, or I could go out in the country … and I'll learn more. So I decided to go that way and like within two weeks I was already rebuilding engines, so it was definitely, definitely worth doing it that way. … And then same with like helping out my family, working on all their cars, keeping all their cars up to scratch, safe and all that sort of stuff. Um, and those were that main things that sort-of, sort-of pushed me into in.

Participant 1 discussed the positive experience gained from making use of their problem-solving ability, not only on task, but also the opportunity to make use of the ability to share knowledge with their coworkers. Participant 1 stated:

> I just love being able to, a bit of fault finding, being able to pull something apart, see how it works, put it back together, the variety of stuff you get to work on. Yeah, I do enjoy it. It's good to find things like that and be able to pass it on to someone else. I don't mind it. It's definitely, it makes you think and I don't mind that.

Participant 5, who worked within the agricultural industry also discussed the

satisfaction gained from utilising their ability to move beyond basic mechanical skills in the workplace, commenting:

> That's what it comes back to, it's diagnosis, a lot of people in the whole mechanical industry, whether it be mining or agriculture can replace a part that's broken, but finding out why it broke, so it doesn't happen again, is to me, key.

Participant 8 discussed a similar need to make use of their ability for problem solving, indicating:

> Because I've got a good understanding of why something works, I can actually understand why something then doesn't work and how to fix that … it's more the brains trust of why that is doing that and let's look at why we're continually having that problem, righto let's eradicate that whole problem if we need to go down a different path.

Achievement. Several mechanical tradespeople discussed the feeling of accomplishment gained from successful fault-finding tasks. Participant 2 stated "you can spend hours chasing your tail. Fault finding. But at the end of it when you have fixed the issue, that's the reward. If I can walk away and see the customer is happy, that is the reward." Their colleague, Participant 3 also discussed the feeling of accomplishment gained from persisting with fault findings tasks for customers, they indicated "there's a bit of satisfaction, actually finding it in the end. Well, you've got to because that machines probably worth $100,000 that tractor and it was a $2000 computer in the end that was playing up." Participant 11 also discussed the sense of achievement gained from solving customer problems, explaining "you get a sense of satisfaction when you actually do fix one, sounds weird when I say it, when a customer's been in with a vehicle that has an issue and when it leaves it's fixed, it's really good."

Participant 19 also discussed the feeling of achievement gained when completing

specialised mechanical tasks for their customers, indicating:

> In the current role I enjoy, you know, say you come in with your Prado or whatever you drive, and you go right well I want to the Cape, and then dump a heap of money on it, and I'll set it up to go to the Cape. You know, seeing people's reaction when they get their car back and it's all decked out ready to do a big touring trip, that's pretty cool.

Participant 9 discussed the sense of accomplishment experienced while they were working in the mining sector under time pressures, saying:

> Diagnostics is probably the most enjoyable thing for me, the actual swinging of spanners I didn't actually find that satisfying to be honest with you, but once you've repaired something and away it goes, that was satisfying I guess. Especially in the mining environment where time was money. Like on the rigs, if the rig shut down you'd be woken at bloody 2 o'clock in the morning, the whole rig completely shuts down and there's 30 people looking at you. A lot of pressure and that sort of stuff, and that was good, it was satisfying to get it running again. You earned your money out there. Good dollars but you were worth a lot more to the company that your wage tenfold so if you could get a rig going in 1 hour rather than 1 day, you might save them $100,000.

Working in the aviation sector as an independent inspector, Participant 13 discussed the sense of pride they experienced when being a part of a team who achieved high performance rates in relation to a particular aircraft. He stated:

> You wouldn't believe it, but our little unit out at Oakey with the MRH90's we are the, we fly the highest number of hours on the MRH90 in the world. And we have the highest serviceability rates of that aircraft type in the world. So you know, I get a bit of pride there, knowing that I'm part of that, that I helped make that happen.

Coworkers. Many of the mechanical tradespeople discussed the value they placed on positive interpersonal relationships in the workplace. For example, Participant 1 described their experience with their coworkers, saying:

> It's a pretty good atmosphere out there with the boys, we usually have the radio going and not everything is all serious. There's not usually too many days like that, where they're hot and you're over it, but with all the other guys out there. The guys in the workshop are good to work with.

Their father, Participant 2 agreed, stating:

> Every day there is something different. There is always something challenging and it's just enjoyable being out in the field … working alongside the young guys. They are probably the best. There is always a serious side to work, but you'll get frustrated and they'll say or do something stupid, and that sort of breaks it all up, you have a bit of a laugh about it, then okay, it's alright.

Participant 10 worked in a mechanical fleet maintenance crew and explained "I like working in a team, because you can just bounce ideas off. I would say I'm an introvert, but I do like working in a team and that social interaction." Participant 11, who worked also worked in a regional workshop agreed, stating "being in the workshops good because there's someone to talk to, you sit down for lunch and have a bit of a chat with the boys." He further explained the value and role of positive coworker interactions, stating:

> You really need a clown in every team, just to, just to joke and much around and make everyone smile and yeah, it's sort of, you've got to have a happy team to make it work. And a lot of the time you'll be standing two inches away from the person, you know, working under a dashboard, if you've both got the shits with each other, you both hate each other, it just doesn't work.

Their colleague Participant 11 agreed, explaining "I get along with all the boys. That's

what pretty much keeps me there because I, you get a good like, just kind of second family like you spend more time working with them, then you're at home." Participants 17 and 18 worked at the same smaller regional workshop and both discussed the value they placed in their interactions with coworkers. Participant 17 indicated "it's a good easy crowd to work with, so it's a happy work environment 99% of the time. The attitude of all the fellas, and you're really appreciated with what you do. Just the friendliness," while Participant 18 stated "I get along with people, I love learning new things, just the work in general, like you can always have a bit of a joke." Similarly, Participant 19 who worked for an automotive business indicated "it's a good workshop, most of the blokes are pretty good."

Several participants highlighted the value they placed on positive coworker relationships by discussing their experiences where their needs were not met within their work team. For example, Participant 1 explained:

> We recently worked with a guy, he didn't last very long with us. He was very painful to work with. He tried to finish their apprenticeship twice with two different companies. Yeah, knew everything, you couldn't explain it to him. He came in thinking he was boss. So when you're working with people who you get along with and you know how they work, and they are willing to learn things that you've done off you, and you're willing to do the same, it's goes really smoothly in the workshop. But when you get that one person that thinks they know everything and doesn't want to take on any knowledge it's very hard.

Participant 2 provided similar feedback, stating:

> There's been a couple of guys through here that didn't fit and those days you know there is going to be a problem and you've got to go out somewhere. Where's a bailer I can go and fix? But yeah, we've sort of trimmed them out and the crew is good. But the big thing is getting the right team.

Participant 3 indicated that they had previously left a work environment where their need for positive relationships was not met, stating:

> There was one old fella that was a bit domineering. We would all the work out the back and he would sit in the office and tell you in not a very polite way that you'd not done it right. So, things probably got a lot better when I actually moved here.

Participant 6, who had disclosed a high level of satisfaction in relation to their job in the mining industry discussed their need for improved relationships with coworkers at varying organisational levels. He reported:

> The way they manage the system and the way you interact with the other techs. I find, the most challenging, I can do the work every day of the week, but the mind games that people play with-in job, I don't do well, I don't really do well at that.

He explained that as they wanted to remain in the role and valued collegial relationships with their workers, they had had to develop coping mechanisms to more effectively manage difficult relationships in the workplace. Their brother, who also worked in the mining industry also raised concern regarding their experiences with coworkers. Participant 7 indicated:

> A difficult thing I found was just being in charge of large groups. Different people talk, you get called things and it goes pretty well to heart, like you feel it a bit more. But then you sort of just realise what sort of people some of the other people are and you just stick away from them. There is always going to be those sort of people, even at school, they're sort of not really the bullies, in school you'd call them bullies, at work you just call them I don't know, it would be something else but they're always just trying to start something and make you sound worse, the sort of thing but then you get the good guys that work with, and like I'm still getting calls the guys, giving them references for new jobs and stuff. They're the guys you'd want to work again

with.

Participant 9 also discussed the value they placed on healthy relationships with coworkers, discussing their concerns when those needs weren't met, indicating:

> It's the human factor always. We had a terrible Principal here … there was a lot of in-fighting here, a lot of bitchiness, ah it was bloody terrible. I've never worked in an environment like that, I've always worked in, where you looked out for each other, got each other's backs, you would cover for each other, you know it was good morale and team work, but that is non-existent here and that's a huge part of morale, pretty much, so the human factor is what I think is the biggest thing.

Social Service. When discussing the mechanical trade work that they completed with others, several mechanical tradespeople mentioned experiencing a sense of social service when assisting customers. Participant 2 stated "so, with the tractor side of things, if I can walk away and see the customer is happy, that now is the reward." Similarly, their coworker Participant 3 explained:

> A lot of them I suppose are people I've grown up with and a lot of them are friends and you feel a certain responsibility to do a good job, or the best job you can for them … most people are really good and understanding, there's realistically 90% or 95% of the farmers understand the process that if the shop doesn't make money it's not here, and their service will go somewhere else, or their little bits and pieces will go somewhere else, and they won't have anywhere. Or there will become a monopoly next door, you know he'll be the only dealer and I'm sure their scenario is no different to ours.

Participant 3 extended their sense of social service to the need to keep small businesses operating in regional towns. This discussion was similar to Participant 5, who was also employed in a regional town. Participant 5 stated:

> Every time someone comes in, they've got a problem that they need sorted out. You can either sit there and say fuck, I've got to go and sort this shit out and get this tractor going, or you can say righto, we've got a problem, let's solve it, let's get the customer happy again. … The decisions that you're making all the time, you've got to consider the customers best interest, and you've got to consider your best interests as in a business, to make sure it makes money. There's a lot of things that end up in that mix to make sure both of those parties are happy. … that's my values, and that's important to me.

In terms of placing value on support provided to the community, Participant 10 also added:

> Yeah I find it very satisfying, when you're, and especially here because you've got to keep the fleet going because we're service based, you know you we're keeping the town of Toowoomba going sort of thing. So yeah there is huge satisfaction in that.

Additionally, both Participant 11 and Participant 19 discussed the sense of satisfaction gained when assisting customers, adding "you get a sense of satisfaction when you actually do fix one, sounds weird when I say it, when a customer's been in with a vehicle that has an issue and when it leaves it's fixed, it's really good" (Participant 11) and "you know, seeing people's reaction when they get their car back and it's all decked out ready to do a big touring trip, that's pretty cool" (Participant 19).

Supervision-Human. Several workers discussed the role of their employer in meeting their need for supervision and support. Both Participant 1 and Participant 3 discussed the value their shared employer provided in terms of their job experiences, with Participant 1 stating "Damien is good as a boss" and Participant 3 adding "things probably got a lot better when I actually moved here. I got a bit more respect." Participant 12 indicated that the relationships with their supervisors and employers impacted upon their persistence intentions

within the workplace, saying “I've got offers from other companies in excess of nearly 300 bucks more a week. But the loyalty from this company so far, I’ve just stayed with them.”

Participant 11, who worked in the automotive industry, discussed the importance of the supervisory role in assisting the work team to meet their key performance targets, due to their understanding of the work requirements and team skill sets. He stated “there's a lot of management knowing who to allocate what job to, to keep everyone happy, you keep your percentages up, your KPI’s and that sort of crap, you keep everyone moving forward.” Participant 11 explained the benefit in a high quality supervisory relationship allowed them to perform their work in standard hours, assisting with their work-life balance.

Supervision – Technical. In additional to human supervision around working conditions, several workers discussed the need for technical supervision within their work roles. Participant 6 discussed the role of their employer training them well to complete the complex task requirements within the mining industry, indicating “the company I work for now, they are giving us courses on how to use the programs. Which is good, they actually do train us. They are actually putting more into training. So that we can actually use the search functions within our smart phones etc. So they are putting training into us to learn the new skills.”

Participant 14 also discussed the value of technical supervision, stating:

> Yeah definitely, so um I was pretty lucky, I got to work with the head mechanic for four years, beside him and with him. So I was pretty lucky there, it was a bit of a mentorship. … it’s pretty good I think, because you get, like as I was saying before, the training throughout that Toyota network. Even though it’s only one brand, most of it’s transferable across the lot.

Participant 15 discussed a similar value for supervision to Participant 14. Participant 15 indicated:

> My boss he started when he was 16 his apprenticeship, he's in his early 60's now, he's been in it a while, he's owned a few different businesses through specialists, through just general workshops, he's worked in agriculture and all that as well, he had a lot of knowledge which another reason why I wanted to do it in a place like that, because the people that do work there normally have been around and they have a lot of knowledge that they can hand on to you. So, a lot of my knowledge I did get from the boss, especially the older cars and stuff like that.

Responsibility. A few of the mechanical tradespeople discussed the ability to make their own decisions within their jobs and the role of autonomy and responsibility. For example, Participant 5, a mechanical foreman stated "I run the workshop and I'm responsible." He valued the level of responsibility provided them by the employer and the ability to communicate appropriately with the employer around decision making processes that affected their business.

Participant 7 discussed how their attitude for learning and technical advancement had led their employer in the construction industry to provide them with greater autonomy and responsibilities when working within their team. He described:

> By about three four months into my job I was leading hand teaching other people how to do it so. That sort of reward for me, other people come to me and asked me how to find stuff on the drawings and where they are. So that was sort of rewarding as well.

Participant 13 was also responsible for decision making around team management on-tools, indicating that when they were working on the helicopters:

> They're a bit smaller, they're a lot smaller, you can take a bit more ownership of the job. But I also work in the capacity of a tradesman and a supervisor, it's just another sort of higher level of certification that I can do. So, being in that, sort of higher position, I might be given a work package and a team, and be told that's your aircraft

go and do this.

Autonomy. Several of the tradespeople interviewed discussed the value they placed on their ability to work with little supervision across a range of work duties. Participant 11 who worked in the agricultural and heavy machinery sector stated:

> I like getting in the ute, throwing my tools in the back, righto, the boss can go and get stuffed for the day, I'm gone, I can just go and do my own job." Participant 5, who was a workshop foreman, discussed their role and how their employers "basically give me autonomy to run the workshop.

As another mechanical tradesperson who had supervisory duties, Participant 13 explained:

> I might be given a work package and a team, and be told that's your aircraft go and do this. Here's your people, make it happen, you've got x hours, that I don't, I like doing that. I'd been doing that a Boeing previously. Essentially where I'm at, I'm in a position where if I chose to be on the spanners, I can, whereas at the same time, like today, I was given a work package and a couple of guys, and go make this happen, so I did, so I didn't pick up a spanner all day. I was on a computer most of the day, doing the documentation, but I basically coordinated the service, and then I come and do my inspection here. And then, we'll go do these jobs and I'll do all the documentation while you guys do it, and then I'll come and certify it all. So I've got that option.

Advancement. The mechanical tradespeople interviewed discussed the value of advancement opportunities within their jobs, as well as their occupations. Mechanical tradespeople are trained through a system of advancing skill development within the initial years of their apprenticeship. In addition, many of the tradespeople interviewed also discussed skill development and professional advancement that occurs post trade-qualification. For example, Participant 2 commented "so out of being a serviceman, doing

like general repairs, into specialising in a field, that was really good." Other mechanical tradespeople discussed the opportunities for role progression with their employer. Participant 4, who worked for a regional agricultural machinery business, indicated "it's just one of those things. You might get the opportunity to move up the tree, you might, you know" when discussing their reasons for persisting with their job with their employer.

Participant 6 discussed the value of comfort and security needs being met through their current employment, as well as the value in knowing that they could gain advanced skills in alternative roles with the mining company whom they were employed by. He indicated:

> I've had ideas of going to an operational. Like because you get maintenance and you've got operations which control the process … So I can sort of move into a different field, but still have my trade background and use it in a different area of work. I have thought about doing that, but the job that I have at the moment and how it works and what I get to work on.

Participant 8 who was employed as a principal mechanic in a local government fleet maintenance workshop discussed how they valued the opportunity to utilised advanced training to complement their trade as a diesel fitter, indicating:

> Like for me, because I'd done the diesel fitting and then, and I was always, well why are we fixing this the same time, like every time and I wanted to find all that out. That's why I went to university got my engineering and went down the reliability field, but that's just me. … So where do I end up, I plan on being in this sort of role, which is not a hands-on physically fitting a tyre or fitting rollers anymore, it's more the brains trust of why that is doing that and let's look at why we're continually having that problem, righto let's eradicate that whole problem if we need to go down a different path.

Participant 10 discussed similar ideas about the role of their possible technical advancement within their occupation, stating:

> There is I suppose the scope to progress up the line up the management level if you want to. Yeah, I don't know, sometimes I don't feel like doing that, but then there's times and yeah, you sort of get into it and you go, I want to make changes or I want to do this.

The colleague of Participants 8 and 10, Participant 9, whose role included foreman duties within the same agency also discussed the value of advancement opportunities for the mechanical tradespeople employed within the team. Participant 9 indicated that their previous employment as a mechanical tradesperson in the army and on mining rigs had established their values for skill advancement within the trades, linking development of their team with building their job satisfaction and persistence intentions. Participant 9 explained:

> When I first got here, there was people that, I'm going to blow my own trumpet a little bit here, they'd been here for years and years and years, they'd had no training, no further education, no specialised skills, nothing. So I was like, this has got to change you know, we better give these guys a go or else we're going to lose them, so a few of them have done dogging course, high risk work, truck licences, I've got 12 of us going through TAFE at the moment upskilling our trades. And we're not, every time I've tried to do these, the manager, the Principal tried to stop it, and I was like why, why would you do that? Invest in your staff and you'll keep them, but they just don't understand that. And I've got a fair bit of thanks from the guys that have been here a long time, it's pretty awesome you know.

Participant 13, who worked on aircrafts as a helicopter technician discussed the value of career advancement in relation to their career decision making. They described:

> I've gone from working on the oldest helicopter in the Australian Army Fleet to the

> newest, and it's also the most advanced helicopter in the world. … career progression … was important, was just that feeling of just not being stuck in the same spot, doing the same thing for the rest of my life. … you don't have to just be there spinning spanners, you can move into maintenance, management, or even just team leading, like running teams, project management. I've done a cert 4 in project management since. … My next step would be flight line coordinator, so off-tooling, that's sort of the next step up, where you're managing a shift of people.

Similar to Participant 9, Participant 13 discussed the connection between workplaces providing relevant opportunities for technical skill advancement and the retention of mechanical trade workers. Participant 13 added:

> I work for Airbus now, and yeah, I think they have issues with retention and part of it is, the only career, well they don't do career progression really well. … the only training seems to be focused on management or leadership, and there's a lot of guys that just aren't interested, especially young blokes, like guys in their 20's who want to become subject matter experts on different things, you know, different systems, but if they offered more, like trade based courses, like engine courses, or a transmission course or something like that, or moving sideways into doing composite repair work as opposed to straight mechanical, because a lot of the young guys would go for that, I think, but you know instead all you get offered is leadership and management course, and the guys are going, that just bores me to tears, I'm not interested, mainly because our flight coordinators are in their 50's and 60's and they look at those guys and go that's crusty old me by the time I'm 30. But I think, just from my own experiences, companies need to offer more, career or trade based training, just to lift, to allow people to become subject matter experts, because the workforce will win out in the end, because those guys come back and they'll pass their knowledge onto others.

Participant 14, employed as a mechanic in a large automotive company discussed the role that advancement opportunities had played beyond their apprenticeship training and on-site experiences, indicating:

> Yeah, so I did my trade, light vehicle mechanic, and then through Toyota they have their own training after that. Where you do diagnostics and more technical sort of stuff. I'm getting more and more as I progress, to start with I didn't as an apprentice. But now I'm doing a lot more customer related stuff, whether that's test-driving or showing them things, um yeah, so it's progressing more and more.

Participant 18, added discussion in relation to technical skill advancement available to support their role in the agricultural industry, stating:

> I wouldn't mind learning hydraulics and all that sort of stuff. I think you can do that on top of TAFE, I think that's only another 6 months or something, on top of , it depends, if they send the boss the forms, and they say do you want to learn this and what not. Like you can do your air-con course and all that stuff, like I wouldn't mind getting that. Like the boss just got all the other fellas their air-con course not that long ago.

Social Status. Two of the mechanical tradespeople interviewed discussed the role of their employment status in their communities. Participant 6 discussed their mining role, noting "I think … the industry … being in gas, I see as the pinnacle of my trade," while Participant 13 explained:

> I've gone from a 31 year old driving a taxi, basically not knowing where my next dollar was coming from, to a 47 year old father of three, house, cars, and working for the biggest aviation company in the world.

Personality and Affective Traits

Data coded as diligence, prudence, consistency of interest, and persistence of effort provided descriptions around person characteristics demonstrated by mechanical tradespeople in relation to their occupation. The description of personality traits in the mechanical trade context, as reported by participants can be viewed through the conscientiousness constructs of diligence and prudence, and the grit constructs of consistency of interest and persistence of effort.

Quintessential mechanical tradespeople in Australia are traditionally characterised as hard-working, value-oriented people with a down-to-earth character. They demonstrate commitment to their work, their lives and their communities. Language within the realm of mechanical trades is often colloquial, forthright and functional. The use of profanity is pervasive. Swearing is ubiquitous, but generally not intended as offensive. Many mechanical tradespeople demonstrate persistent commitment to their work and personal lives, as well as consistency of their interest in the mechanical domain. During interviews with the participants, personality and affective traits were presented in terms of how the mechanical tradespeople discussed their work behaviour and experiences, which is consistent with the realistic nature of their work and character.

Diligence. Diligence in the work environment relates to hard work, self-discipline, and motivation to achieve. A 47-year old aviation mechanic commented "anything mechanical needs to be done properly. I've taken that approach with cars and all that sort of stuff too, you do it right or you don't do it." (Participant 13). A mechanical foreman in the agricultural industry explained that after working in their community as a mechanical tradesperson for 38 years, that "you feel a certain responsibility to do a good job, or the best job you can for them" (Participant 3). Another mechanical foreman working in the agricultural industry commented:

> Every time someone comes in, they've got a problem that they need sorted out. You can either sit there and say fuck, I've got to go and sort this shit out and get this tractor going, or you can say righto, we've got a problem, let's solve it, let's get the customer happy again (Participant 5).

Participant 19 also discussed the consequence of personal diligence on others, explaining "you've gotta be on your game, or else, you know, you cost the company money, you cost 30 people their jobs." Several mechanics discussed the sense of satisfaction they gained through their hard work problem solving in the workplace. For example, this agricultural mechanic commented:

> I guess there's a bit of satisfaction, actually finding it in the end. Well, you've got to because that machines probably worth $100,000 that tractor and it was a $2000 computer in the end that was playing up. Yeah, you've just got to keep at it. It doesn't get any easier, it's probably gets harder. And it gets easier to make mistakes, to grab at the first thing that comes along and change that, and suddenly that was a $1000 down the drain that didn't fix it, and someone's ultimately got to pay for it (Participant 3).

Prudence. Prudence in the work environment relates to deliberate thoughts regarding the consequences of ones' actions, particularly in relation to long-term outcomes. Several mechanical tradespeople discussed the role of considered choices made throughout and in relation to their careers with regard to the long-term consequences. This included primary occupational choice, choice of employer around training and skill development opportunities.

As a mechanical gas technician, who was a third-generation mechanical tradesperson, Participant 6 indicated they:

> Chose what I thought would be the better training, as in they have apprentice training areas, not just the small workshop sink or swim scenario. And that they sort of had a mentor such, not just a tradesperson or an apprentice trainer.

He worked in an industrial city and described the role of their career choice in relation to potential for career progression. This experience is similar to that of an automotive mechanic, who demonstrated layers of prudent decision making in terms of future expected outcomes and satisfaction. Firstly, in relation to the choice of career and again, in relation to choice of workplace:

> Yeah. That's what everyone was sort-of saying, and I at, from the get-go I could, knew like I was going to do a trade, like I could do whatever I wanted to after that, but like, I was never going to lose that trade, that knowledge that I obtained, so I could always fall back on it if anything went wrong, or I just needed money quickly or whatever, I could fall back on the trade and get a job (Participant 15).

Participant 15 also commented:

> Yeah, I tossed up when I was looking for somewhere to get an apprenticeship, I tossed up whether, because I had an offer to go to a dealership, work at Toyota, um, because I had family in there, I had cousins or whatever that worked there that offered me a job. I was sort of sitting there sort of going, it would be good, it would be easy, you know it would be sweeping floors for the first two years before I touched any tools, I sort of thought, or I could go out in the country, get a job out there, um, where I've got more of a variety and I'll learn more. So I decided to go that way and like within two weeks I was already rebuilding engines, so it was definitely, definitely worth doing it that way.

Another diesel mechanic expressed similar thoughts to several mechanics regarding the long-term usefulness and adaptability of mechanical trade skills in relation to other work areas, particularly in relation to farming. Participant 10 commented:

> I could see something that could work hand in hand with the rural industry. Because you know, we had a farm, we had tractors, dozers whatever. It was a good trade to

have and then if you wanted to go back on the farm, you could do all of your own repairs.

Consistency of Interest. Many of the mechanical tradespeople interviewed explained they had early interest in involvement with mechanical tasks in the home, social and learning environments. Some demonstrated interest in mechanical trades as early as primary school, like Participant 15, who stated "Um, I always knew I wanted to do a trade. As soon as me hands were big enough to hold the tools I was into it."

Similarly, Participant 11 commented:

When I was in grade 1, this is how I remember I knew I wanted to be a mechanic since I was 5. Because mum kept the paperwork, they did you know, some stupid little test that they do, you know, what do you want to be when you grow up? Everyone else writes you know, fireman or an astronaut or something like that, I wrote mechanic. Yes that what I wanted to do since I would write. Yeah like, going into it, doing it with dad, I started year 10 I started doing my school-based trainee stuff.

As Participant 1, a 24-year old diesel mechanic, explained:

I fell in love with mechanics from a really young age and so I knew what I wanted to do. I just really enjoyed doing it. Yeah, it sort of gave me something to look forward to I guess. I've always grown up around working on cars and what not. Yeah that's just what I wanted to do." Like their son, Participant 1, Participant 2 explained "I had always been interested in mechanics and dad had always done it all himself on the farm and I learned most of it, so that's how I ended up there.

Similar comments were made by Participant 4, a 40-year old agricultural mechanic who entered the trade as an adult apprentice:

I've always been, ever since school, like I wanted to be a mechanic. Yeah, well I've

> basically always had cars as a kid. We used to flog around in them. Old bits and pieces, anything, motorbikes, whatever, you know, involved with speedway so you basically have to have a lot of mechanical knowledge to do that, otherwise you're having to pay other people to do it so we always built our own cars and own engines ever since I was a young-in.

Again, the context of farming was mentioned:

> It was something that I had always been interested in, farming industry, mechanics per se. I was 17 when I first built my own car, which was a 58 Holden. So that was probably, not the start of the passion, but my grandparents had always been farmers. I think it gets in your blood. We were forever pulling shit apart, whether it went back together or not, completely irrelevant.

Persistence of Effort. Several mechanical tradespeople indicated that their preference for realistic work, meant that they often found their trade school training to be different, or uninteresting. Despite this, they reported persisting with the training, in order to achieve their career goals. For instance, Participant 1 indicated "I didn't enjoy it, but it had to be done. I got through it fairly well. Through all the TAFE stuff," and also:

> With certain parts, different courses, there was some that I went through, really flew through. But there were others that I sat down and really had to read some of it because it might not be something you really work on a lot. But I got through in the end.

Participant 5 reported "I knew that there would be areas that I would have to work hard to bring my knowledge up." He described having experienced learning difficulties throughout their school years and the associated difficulties around bookwork related training. Participant 6 described their movement from one industry to another, and the need to be persistent with their learning in order to meet different work standards. He described being

rewarded for this persistent behaviour in the new workplace, through swift promotion and coworker relationship. He indicated:

> Yeah, so again going back into the mechanical fitting, which I hadn't done before the construction. Yeah just interpreting your drawings and stuff like that. I found that a challenge and then actually found out I probably knew a lot more than what other people did that have been doing it longer than me just because I thought I was behind to start with and so I actually spent the first few weeks just picking people's brains, research on the Internet how to read them, and by about three four months into my job I was leading hand teaching other people how to do it so. That sort of reward for me, other people come to me and asked me how to find stuff on the drawings and where they are. So that was sort of rewarding as well. I studied the crap out of it because I didn't want to be caught looking like an idiot.

Another common area where persistence of effort is demonstrated within the mechanical trade domain, relates to the depth to which some problem solving tasks require personal application. This ranges from multi-level task problem solving, through to problems that require several technicians to address. Participant 3 describes how changes in the agricultural industry relate to their experience in the workplace as:

> When I first started off, AGCO would have had two ranges of tractors, like they would have had 1100 series, like 1175's and 1155's, and then smaller 100 series. They were older tractors then, they were just, you still had to work them all. Where now a days there's machines made all over the world and there's about eight different tractors ranges, so I just find it's getting harder and harder to know. You spend more time just actually looking for questions than actually with hands on, especially with trying to help the workshop as well.

Realistic Interests

When discussing their realistic interest experiences, most mechanical tradespeople who were interviewed discussed having realistic interests in relation to both their occupational and personal interests. For example, when discussing their experiences working on mechanical trade tasks Participant 1 explained:

> I just really enjoyed doing it. Yeah, it sort of gave me something to look forward to I guess. I've always grown up around working on cars and what not. Yeah that's just what I wanted to do. I just love being able to, a bit of fault finding, being able to pull something apart, see how it works, put it back together, the variety of stuff you get to work on.

Their father, Participant 2 not only discussed their mechanical trade interests, but also indicated:

> A friend of mine owns a farm just out of town. I used to spend a fair bit of time out there with his horses, training them. We used to be big into Clydesdales, so we had a Clydesdale stud and a friend of ours had a Clydesdale stud, so I would go out and train his horses. And while I was out there, any machinery that he needed repairing I would. That's where it all sort of came into it and hay time I'd come out and do a bit of work with is bailers.

He also discussed interest in motor and outdoor sports, explaining:

> We were into drag racing. When we weren't drag racing we were fishing. … we like to ride. So the city rides are more enjoyable than the country rides. I miss the ocean. We've got a boat in the shed, and we can't get around there as often as we'd like to.

Participant 4 discussed also discussed interest in motor sports, indicating:

> Yeah, well I've basically always had cars as a kid. We used to flog around in them. Old bits and pieces, anything, motorbikes, whatever, you know, involved with

> speedway so you basically have to have a lot of mechanical knowledge to do that, otherwise you're having to pay other people to do it, so we always built our own cars and own engines ever since I was a young-in.

Participant 5 also described interest in motor vehicles, explaining:

> I was 17 when I first built my own car, which was a 58 Holden. I think it gets in your blood. I mean we used to pull shit apart, you know, when from being young kids and I remember my grandfather saying that bloody thing has got a spring in it, it's going to knock your head off! Well it didn't stop us. We were forever pulling shit apart, whether it went back together or not, completely irrelevant.

Participant 12 also discussed interests in motorsports, explaining "we actually do speedway and all that type of stuff, ride motorbikes." Similarly, Participant 13 also discussed an interest in motorsports stating:

> I'm a car guy, so um, and I build drift trikes and stuff like that at home. I've got an old 60's mustang in the shed, yeah it was going to be, when I bought it, a quick, tidy this up, and start driving. And here I am nearly 6 years later, and it's still up on blocks in the shed. Because I fix one bit and look at the next bit and that looks a bit dodgy, I'll fix that, and then it just snowballs to now I've got complete new wiring and all the rust has been cut out, and rust proofed better than it was when it came from the factory, and um yeah, brakes are three times the size of the originals.

Participant 14 also discussed working with motor vehicles and early interest in hands-on tasks. He described:

> Fixing up old bush bashers and stuff like that at home, and um stuff dad was working on and what not. Just probably fixing things up, getting things going and um, it's a bit hard to describe, making things better I suppose. I've got performance interests, and also 4-wheel-driving interests, and then through my brother and my dad, a bit of an

old car interest.

Participant 19 spoke of motor sport interests as well, explaining:

> I bought my first car when I was 12, it was a 1960 FD Holden. One of dad's best mates was a local mechanic, you know there's only two garages in town and I spent most of me time running around there, fixing motorbikes and whatever I could get to with an engine. I still have, a shed full of old cars, I still, I just like the, well one thing I like when I restore a car, horsepower and the thrill.

While Participant 6 described having interest in a variety of realistic activities, saying:

> I was into woodwork. I enjoyed woodwork and that was my almost one of my thoughts of doing like a chippy trade. But being mechanical, it allowed my timber work to be my hobby. If that makes sense, where how many builders do woodwork on the weekend for fun, or how many mechanics work on their car for fun. That sort of scenario is what I planned all those years ago.

Participant 8 described early exposure to heavy machinery through their family's earth machinery business, as well as general interest in farming. He reported that they had previously been employed as a cane farmer, however this had not remained financially viable, therefore they trained as a mechanical tradesperson in order continue in realistic employment. Participant 8 stated:

> I've basically been working with earth machinery since I was a little kiddie. I basically I got my finger jammed between a bull dozer blade and a tree I was 10 years old. I have a long affiliation with bull dozers. I've been around machinery all of my life. I went and bought a cane farm, and the cane went through whatever, I was at Wallaville there, and that was yeah, because I always wanted to be a farmer. When I actually got serious about the diesel fitting was when I sold that, came back down. … Yeah, ever since I was a little fellow I was always pulling apart a lawn mower or fixing this or

> fixing that. Had I been on a, not a machinery style property but a cattle property or whatever where you're more into horses no agricultural equipment, I probably wouldn't have been going down the line I did. It would have more been animal husbandry or something like that I imagine. But yeah, it's one of those things.

Participant 11 discussed interest in hands-on mechanical work during primary school, stating:

> When I was in grade 1, this is how I remember I knew I wanted to be a mechanic since I was 5. Because mum kept the paperwork, they did you know, some stupid little test that they do, you know, what do you want to be when you grow up? Everyone else writes you know, fireman or an astronaut or something like that, I wrote mechanic. Yes that what I wanted to do since I would write.

Participant 15 discussed development of realistic interests as it related to outdoor activities with their family. He reported:

> When I was younger and that, my parents grew up through scouts, venturers, 4wding camping all that sort of stuff, um, so I had, still have a real passion for all of that, and my grandfather was a fitter and turner, so he did a lot of mechanical stuff as well. So, whenever we went around there, at the time when I was younger, he was building a 43 Huppmobile from scratch, basically from the, completely rebuilt it. As soon as me hands were big enough to hold the tools, I was into it. I always wanted a 4-wheel-drive, as soon as I got my licence I got a 4-wheel-drive, being able to work on it and fix it and get it to the point you want it to. … I still enjoy more-so working on the 4-wheel-drives and stuff like that, like we've had race cars and stuff come through and all the fine tuning and rebuilding like performance engines and stuff, like I do enjoy that sort of stuff, but like my passion and that, is in the 4-wheel-driving and camping side.

From the qualitative findings, it can be argued thematic personality and affective state and realistic interest construct themes of diligence, prudence, consistency of interest, persistence of effort and realistic interests could be operationalised as goal-directed activity in Study Two. Goal-directed activity was not identified in Chapter 2 as a potential SCCT construct to be operationalised in the present research project. Goal-directed activity is a core construct of the SCCT model of job satisfaction (Lent & Brown, 2006a, 2008). This construct is theorised to directly impact satisfaction and to mediate the paths from the predictor variables of contextual barriers and supports, self-efficacy, and outcome expectation variables to satisfaction (Lent & Brown, 2006a, 2008). The presence of goal-directed activity enables workers to exercise personal agency (Lent & Brown, 2006a) while participating in valued activities, providing life structure and meaning (Lent & Brown, 2008).

Discussion

The results of Study One supported the domain-specific operationalisation of the mechanical trade career constructs in relation to the core variables of an integrative SCCT model of mechanical trade persistence. The results were also interpreted in relation to consideration for the face validity of the proposed measures for Study Two.

Table 3 integrates interview data with consideration for the face validity of the Job Satisfaction Scale (JSS) measure as an operationalised job satisfaction. Table 4 integrates interview data with consideration for the face validity of the Occupational Scale (OSS) measure as an operationalised occupational satisfaction.

Table 5 integrates interview data with consideration for the face validity of the adjusted Perceived Organisational Support (POS) Scale for Perceived Coworker Support, Perceived Organizational Support, and Perceived Supervisor Support (adjusted POS-13 item) scales as an operationalised Perceived Organisational Support construct.

Table 6 integrates interview data with consideration for the face validity of the new Mechanical Trade Self-Efficacy scale developed for use in Study Two, to operationalise the mechanical trade self-efficacy construct. Table 7 integrates interview data with consideration for the face validity of the Learning Experiences Questionnaire (LEQ) measure as an operationalised sources of realistic self-efficacy construct. Table 8 integrates interview data with consideration for the face validity of the Minnesota Importance Questionnaire (MIQ) measures as operationalised outcome expectations construct.

Interview data coded as diligence, prudence, consistency of interest, and perseverance of effort will be conceptualised as goal-directed activity and operationalised as Work Effort in Study Two. Goal-directed activity will be operationalised using a measure of Work Effort that incorporates behaviour Persistence, Intensity, and Duration scales. Table 9 integrates interview data with consideration for the face validity of the Work Effort Scale (WES) measure as a goal-directed activity construct within an integrative SCCT model of mechanical trade persistence.

Table 3

Face Validity of the Job Satisfaction Scale (JSS)

JSS Items	Interview Data	Comment on Face Validity
I feel fairly well satisfied with my present job.	Yeah, very satisfied, yeah I find it very satisfying, when you're, and especially here because you've got to keep the fleet going because we're service based, you know you we're keeping the town of Toowoomba going sort of thing. So yeah there is huge satisfaction in that (Participant 10).	This mechanical tradesperson talked about the satisfaction gained from their role within a fleet maintenance crew for their local council.
Most days I am enthusiastic about my work.	It's all good. I love what I do. And I think you need to be passionate, and if you're passionate about what you do, you're halfway to succeeding (Participant 5).	Mechanical tradespeople can use emotive words to describe their enthusiasm for their work each day.
Each day of work seems like it will never end.	I love it. Yep. I enjoy getting out of bed, knowing that I'm coming to work to do something. Every day is different. A different challenge. And yeah, working with the boys, working alongside them (Participant 2).	This mechanical tradesperson talked about the role a dynamic work environment played in their perceptions of their work day.
I find real enjoyment in my work.	Yep, I do enjoy working here. I'm quite happy doing what I'm doing at the moment and being out here. I feel good. I definitely feel like I'm connected. I enjoy the work (Participant 1).	This mechanical tradesperson again used emotive words to reiterate their enjoyment for their work in the agricultural industry alongside their father.
I consider my job rather unpleasant.	I love my job at the moment. It's one of the best jobs I've ever had and I can't see finding another job better (Participant 6).	This 38-year old mechanical tradesperson related their job experience in the gas mining industry with positive thoughts and emotions.

Table 4

Face Validity of the Occupational Satisfaction Scale (OSS)

OSS Items	Interview Data	Comment on Face Validity
I am satisfied with my choice of occupation.	I don't regret my choice. I did quite well in my testing when I joined, so I had the choice, some 20 trades to choose from…specialising in little areas in defence so, yeah I went into the mechanical trade. I always loved tanks too, army tanks, so I asked the career people how do I get to work on them, and I that's the stream that I went down so. I ended up doing that for quite a few years, like on the heavy armour. That was awesome, that was really good doing that work, so. Bloody oath. I'm pretty happy with the decisions that I made yeah (Participant 9).	This mechanical tradesperson talked about how they combined their personal interest of army tanks, with their mechanical trade preferences to develop a career they would be satisfied with.
I truly enjoy the occupation I have chosen.	I'm pretty happy with the way that we went and what I've learned and where I did do it, um yeah, I've come out of it on top I think (Participant 15).	This 23-year old automotive mechanic talked about their satisfaction with the choices they had made, working in a small rural workshop, allowing them to develop a wide range of mechanical skills as a starting point for their occupation.
Given another opportunity to chose careers, I would chose differently.	Yeah, I don't know. I probably will stick to mechanic, but you never know, time will tell later on I guess (Participant 18).	This mechanic was early in their career and noted that they would only envisage changing occupations if there was no work available in their regional area. They noted a preference for living near family and were concerned about the influence of labour market opportunities on their career options.

Table 5

Face Validity of the adjusted Perceived Organisational Support (POS) Scale for Perceived Coworker Support, Perceived Organizational Support, and Perceived Supervisor Support (adjusted POS-13 item) Scales

Adjusted POS-13 item	Interview Data	Comment on Face Validity
Perceived Organisational Support scale		In the mechanical trade context, Organisational Support has been operationalised as support provided in the context of an organisation or within the role of employer/business.
The organization is willing to help me when I need a special favour	You're really appreciated with what you do, just the friendliness. Well, I'm trying to work Saturday's and then have Monday off, and then next year I suppose I'll try and get a couple of days off during the week, and just gradually have it a bit easier and do a bit more at home. Here, you're given a bit of, we're given a bit of scope on what you're doing and that (Participant 17).	Mechanical tradespeople may see flexible working conditions as favourable support from their organisation.
The organization shows very little concern for me	I did take a break. I've only been back 3 weeks. I took a six-month break. It was painful. I hated every minute of it. So I came and saw Damo. He was looking for a mechanic and so I said here I am. So he welcomed me back. The main reason I left here was because my wife was sick. So, the guy that I was working for had a farm out in the country, but he also had a base in Perth. So the idea was for us to get back to Perth, for my wife to get through her illness, but unfortunately it didn't work out the way it was meant to be. Just with my wife being sick I had to get back to Perth, but it just didn't happen. And ..(*employer*).. understood even when I left what was going on (Participant 2).	Mechanical tradespeople may find that their employers demonstrate concern for their individual needs before the business needs at times.

Adjusted POS-13 item	Interview Data	Comment on Face Validity
The organization values my contribution to its well-being	They do with the company I work for now, they are giving us courses on how to use the programs. Which is good, they actually do train us. They are actually putting more into training. So that we can actually use the search functions within our smart phones etc. So they are putting training into us to learn the new skills (Participant 6).	Being seen for their contribution to the workplace can be needed by mechanical trade workers.
The organization strongly considers my goals and values	Not just in general automotive, um like if you're working in a dealership, no it's not there, the only way you're going to get more money working in a dealership is to try and climb through the ranks, become a manager, become a floor manager, you know, um, to try and climb up the ranks, but like, by working in a smaller workshop, you can, like with me and my boss, we talked about it and we worked it out, we got to a stage where he was happy with the work that I was doing and I was happy with the money he was paying me for doing that work. Um, you know, we could talk about it because there was only two of us (Participant 15).	Mechanical tradespeople may consider that support from the organisation is connected to progression of career goals and values.
Perceived Supervisor Support scale		Supervisor support has been operationalised as support by a direct line supervisor, or an employer who is also a direct line supervisor providing technical role related support. This occurs particularly in small business in this work domain and also in relation to VET Training.

Adjusted POS-13 item	Interview Data	Comment on Face Validity
My supervisor really cares about my well-being	I've got offers from other companies in excess of nearly 300 bucks more a week. But the loyalty from this company so far, I've just stayed with them…the Maryborough bosses are pretty good and I get along with all the boys. That's what pretty much keeps me there because I, you get a good like, just kind of second family like you spend more time working with them, then you're at home (Participant 12).	This mechanical trade worker discussed the value of a supportive supervisor.
My supervisor shows very little concern for me	It's a bloody busy workshop this, very busy and it's pretty stressful at times. The staffing issues here, you know such and such's daughter is sick, they've had a fight with their wife, you know you've got to deal with all the human factor as well (Participant 9).	This mechanical tradesperson discussed the importance as a supervisor, in showing concern for the personal lives of fellow mechanical tradespeople in supporting them.
My supervisor strongly considers my goals and values	I thought I'll be sweeping floors for at least six months but I was sweeping floors and looking over the other mechanics. I first started on, I think it was mower services, and then I worked my way up, and then done that, so I went and done the basic mechanical knowledge I guess you could call it. And then you went to the bigger stuff (Participant 12).	Within mechanical trade contexts, the supervisor often assigns tasks. This worker talks of having their values of achievement and advancement being met within the workplace.
My supervisor is willing to help me when I need a special favour	They came in, you know one of the mechanics saw me and said can I knock off now, I want to go do this. And you can sort of say no worries (Participant 9).	Mechanical tradespeople can relate flexible work conditions to special favours to supervisory staff, who assist with their work flow arrangements.
My supervisor takes pride in my accomplishments at work	I said I'm just unemployed as of last week and already I'm getting calls to go back into the diesel fitting which I haven't been in for the last 4 years. So more or less people chasing me for work now which is pretty good boat to be stuck in (Participant 7).	This mechanical tradesperson acknowledged that previous supervisors sought them for further work as they valued their accomplishments in the workplace.

Adjusted POS-13 item	Interview Data	Comment on Face Validity
Perceived Coworker Support scale		
My coworkers strongly consider my goals and values	He started when he was 16 his apprenticeship, he's in his early 60's now, he's been in it a while, he's owned a few different businesses through specialists, through just general workshops, he's worked in agriculture and all that as well, he had a lot of knowledge which another reason why I wanted to do it in a place like that, because the people that do work there normally have been around and they have a lot of knowledge that they can hand on to you. So a lot of my knowledge I did get from the boss, especially the older cars and stuff like that, um, but it's the same with him, like any of the newer cars that came out, we'd both have to learn, track down new information outside, and learn about the new stuff coming in (Participant 15).	Mechanical tradespeople can discuss the importance of knowledge transfer from more experienced tradespeople in developing their own goals and meeting their work values.
My coworkers take pride in my accomplishments at work	Working alongside Ash and Jordan, our other apprentice. Every day there is something different. There is always something challenging and it's just enjoyable being out in the field with them (Participant 2).	Mechanical tradespeople and their coworkers can gain satisfaction in work individually or together in order to meet work challenges.
My coworkers really care about my well-being	I've always worked in, where you looked out for each other, got each other's backs, you would cover for each other, you know it was good morale and team work (Participant 9).	Mechanical tradespeople need to consider the physical well-being of their coworkers to meet basic safety standards. This mechanical tradesperson talked of the support gained from having coworkers that valued each other's well-being.
My coworkers value my contribution to their well-being	Working alongside the young guys. They are probably the best. There is always a serious side to work, but you'll get frustrated and they'll say or do something stupid, and that sort of breaks it all up, you have a bit of a laugh about it, then okay, it's alright. (Participant 2).	This mechanical tradesperson spoke of the role of humour as a way of supporting the well-being of their coworkers.

Table 6

Face Validity of Mechanical Trade Self-Efficacy Scale

Mechanical Trade Self-Efficacy Scale	Interview Data	Comment on Face Validity
I can inspect and test mechanical parts of vehicles, equipment or structures. (For example, cars, tractors, trucks, earth moving equipment, buses, motorbikes, helicopters, pumps, rigs, assemblies and plant).	We do a post-flight service and there's a data device and we download the aircrafts information from the data device, download that to the computer, and then the computer will tell you everything that went on during that flight, we can even find out when the pilots are lying to us about that stuff, because it's all there. They'll go, oh no, we didn't over-torque, well, yes you did, and you did it at this time, for this many seconds, at this height and so forth (Participant 13).	This independent inspector within the aviation industry described inspecting and testing mechanical parts of a helicopter.
I can diagnose faults in mechanical components of vehicles or equipment. (For example, engines, gearboxes, transmissions, brakes, filters, clutches, power, steering, hydraulics, sub-assemblies and mechanical systems).	A lot of times, someone rings up with a breakdown or something, as you're driving around you're sort of running around in your head, it could be this or it could be that, you know. Farmers like when you rock up, when you walk up and you just go, click, click and you fix it like that. They don't like when you're sort of stuck there for half a day and they can see the dollars ticking over in their head you know (Participant 4).	This heavy vehicle mechanic within the agricultural industry described driving to farms to diagnose mechanical faults in machinery including tractors and trucks.

Mechanical Trade Self-Efficacy Scale	Interview Data	Comment on Face Validity
I can service, maintain or repair mechanical components of vehicles or equipment. (For example, engines, gearboxes, transmissions, brakes, filters, clutches, power, steering, hydraulics, sub-assemblies and mechanical systems).	We've had a few tractors in now for engine rebuilds, I've done a couple of gearboxes on tractors now, most of our year consists around bailers (Participant 1).	This heavy mobile plant diesel mechanic within the agricultural industry described conducting mechanical repairs to tractors and bailers.
I can use tools, instruments and equipment to perform mechanical tasks. (For example, screwdrivers, pliers, wrenches, pressure gauges, precision instruments, micrometers, callipers, calibration devices, power tools, jacks and hoists).	I'm in a position where if I chose to be on the spanners, I can, whereas at the same time, like today, I was given a work package and a couple of guys, and go make this happen, so I did, so I didn't pick up a spanner all day. I was on a computer most of the day, doing the documentation, but I basically coordinated the service, and then I come and do my inspection here. And then, we'll go do these jobs and I'll do all the documentation while you guys do it, and then I'll come and certify it all. So I've got that option (Participant 13).	Many mechanical tradespeople use tools and equipment daily in order to perform the tasks of their role.
I can operate vehicles and machinery as required for my mechanical trade role. (For example, forklifts, cranes, cars, trucks, tractors, earth moving equipment and mechanical plant).	From day to day it's very different. You know, I'll spend two days in the workshop on trucks and then it's like righto you're off to Bundaberg, so yep, in the car, you're in Bundaberg all day doing tractor stuff (Participant 11).	Many mechanical tradespeople operate vehicles and machinery daily in order to perform the tasks of their role.

Mechanical Trade Self-Efficacy Scale	Interview Data	Comment on Face Validity
I can use electronic and/or technology systems as required for my mechanical trade role, including to perform mechanical diagnosis, repair and adjustment. (e.g., electronic diagnostic tools).	Absolutely and it comes back to me, to work out, that guy's got the ability to work on sprayers, I need him here and I need him there, I then have to put training into him, in these other parts of the year, where it's not flat out in that particular brand. You try and multi-skill as much as you can and we're lucky in that the Rogators we look after are an AGCO product. So our EDT's (*electronic diagnostic tools*) and that all cross over as far as diagnostic equipment, different mechanics have different skill sets (Participant 5).	Technology systems are now commonplace in the mechanical trade domain. Many mechanical tradespeople use technology systems daily in order to meet the requirements of their role.
I can read and understand technical information (e.g., workshop manuals, technical drawings and fitting instructions).	Getting the information that you need sometimes can be hard, especially with a lot of the newer stuff, like the dealerships and that when they're bringing out new cars, they like to sort of hoard that information, not to release it right away, which when we get new cars like in a smaller workshop makes it very hard if we've got to chase an electrical problem and we need wiring diagrams, pinouts and stuff like that, it can be hard to get that information out of them, um, that's probably been the most difficult thing. Um, especially with a lot of European cars as well, it seems there's just no information in the country about, you've got to apply to get it from overseas and they want to charge you and it's a whole big thing (Participant 15).	Being able to read and understand technical information is a requirement across industry and job roles within mechanical trade careers. Access to required information and interpretation of this information can, at times, require support within workplaces.

Table 7

Face Validity of the Learning Experiences Questionnaire (LEQ)

LEQ	Interview Data	Comment on Face Validity
Realistic Vicarious Learning scale		
While growing up, I watched adults whom I respect fix things.	I had always been interested in mechanics and dad had always done it all himself on the farm and I learned most of it, so that's how I ended up there (Participant 3)	Mechanical tradespeople often say they that during their childhood, they observed adults fixing vehicles or equipment, either in the work environment, at home, on a working property, or in relation to motorsport activities.
I observed people whom I admire work in a garden.	When I was sort of 13 or 14, every summer holidays, I used to actually go with my grandfather for the whole 6 weeks. We used to clover harvest contract, so we were sitting in an open-air cab, two mile an hour on 40-degree days and absolutely loving it (Participant 5).	To relate this question to an Australian context, "work in a garden" was reworded to "work outside in the yard." In relation to experiences of mechanical tradespeople, work outside could relate to paid or unpaid activities.
I observed people whom I respect repair mechanical things.	Pretty much the whole side of the family is mechanics, so I was always around it. Dad's brother, Pop. Whenever I could go and help anybody with anything, I would take the opportunity to do it (Participant 1)	Mechanical tradespeople can talk of observing respected people such as family members, neighbours, personal friends, family friends, coworkers, supervisors and teachers repairing mechanical things.
I have observed members of my family build things.	My grandfather was a fitter and turner, so he did a lot of mechanical stuff as well. So, whenever we went around there, at the time when I was younger, he was building a 43 Huppmobile from scratch, basically from the, completely rebuilt it (Participant 15).	This mechanical tradesperson related as a child, having observed their grandfather rebuild a vintage motor vehicle.
I watched people whom I respect work in the outdoors.	When I was younger and that, my parents grew up through scouts, venturers, four-wheel driving, camping all that sort of stuff, um, so I had, still have a real passion for all of that (Participant 15).	While this worker related having broad outdoor experiences through the family environment.

LEQ	Interview Data	Comment on Face Validity
Realistic Verbal Persuasion scale		
People whom I look up to have urged me to pursue activities that require manual dexterity.	I always enjoyed it, and mum and dad were like, well you've got to get a trade (Participant 16).	To assist with understanding the context of this question, an example of the meaning of manual dexterity was included as "that means activities that required you to skilfully work with your hands." This mechanical tradesperson described the role their parents played in relating their interests to their choice of a trade role entered via vocational education and training.
While growing up, adults I respected encouraged me to work with tools.	More or less my father said have something to back you up. I was more into tourism and hospitality at school and started sort of looking toward the chef way, but nothing really there and the times that you worked didn't really favour you. And dad talked me into applying for an apprenticeship as a diesel fitter, so that's how it started. More off advice, that the work was going to be there for the future, if you wanted to make money, it was always something that you can fall back on too (Participant 7).	This third-generation mechanical tradesperson was encouraged into a mechanical trade by their father, in relation to employment opportunities in the industrial town they lived in.

LEQ	Interview Data	Comment on Face Validity
Teachers I admired encouraged me to take classes in which I can use my mechanical abilities.	Interviewer: In those early days, was there anyone else other than family and friends influence, because those two sort of blend in together, was there anyone like a teacher or someone outside of the family that had a positive influence? Not really no (Participant 1). t took me ages just to get a school-based. I asked in Year 11, it should have been the start of Year 11, but I started Year 12, that's how long it took... Yeah, the school, it was only the teacher though. He was a bit of a twat, but he took for ages just to get emails and everything through, he was just sitting around, he didn't have the motivation to do it, you know how teachers are. (Participant 18). In high school, we didn't have people come and talk to us about career paths as such. So it was a choice you made, on your own, pretty much... In my mind, there wasn't enough guidance for career paths. (Participant 5).	When questioned, many mechanical tradespeople indicate encouragement to take trade courses from within the home and personal environments, but discuss limited support and encouragement from their teachers to advance in these areas long-term.
People I respect have urged me to learn how to fix things that are broken.	I was never really a big fan of school, so I spent a lot of time at work with dad, because my dad works here too. So I spent a lot of time when he worked in Perth as a gearbox condition mechanic, so I go down and spend most of my time there (Participant 1, son - talking about Participant 2, father). He must have been 11, he said I want to be a mechanic. He said, I want to be a mechanic. And I bought him a motor for his Patrol and said if you put that in there, we'll talk about it. And yeah, he did (Participant 2, father - talking about Participant 1, son).	Mechanical tradespeople can be urged by respected others to repair mechanical equipment for a variety of reasons, including interest, socialisation, necessity and value fulfilment.

LEQ	Interview Data	Comment on Face Validity
Family members have encouraged me to pursue activities that involve working outdoors.	Pretty much I was getting involved with what dad was doing. He would show me through something new and then he would give me one to do myself. (Participant 1).	This second-generation mechanical tradesperson talked of how their father would not only show them how to work on mechanical tasks, he would also assist with building their confidence and commitment by encouraging their independence.

Table 8

Face Validity of the Minnesota Importance Questionnaire (MIQ)

MIQ	Interview Data	Comment on Face Validity
Ability Utilisation scale		
The chance to do the kind of work that I do best.	I'm going back to the drill rigs, I like being out and about, you know, and remote area mechanics, it's really, you've got to use your brain to work that sort of shit out, because you can't just do down the road and get a bearing, you've got to make it work with what you have (Participant 19).	This heavy commercial vehicle mechanic valued their contribution as a remote area mechanic in the mining environment.
The chance to do work that is well suited to my abilities.	When I went into it, in the transmission trade, I was there to conquer the trade, that was mine. Once I went into transmissions, I basically walked into a transmission shop, told them I knew everything about gearboxes and set myself up in the back corner and learnt as I went. And I was there to conquer the trade (Participant 2).	This heavy duty diesel automotive transmission mechanic described their career passion for the transmission trade following their early association with the drag racing industry.
The chance to make use of my best abilities.	Yeah, that was one of the main reasons I came out here I guess you would say, there was more hours and more work, and there was a better variety of work on offer, it was exactly sort of what I was looking for yeah. And I had the chance to learn more as such, yeah it was great (Participant 16).	Mechanical tradespeople can relate their choices to experiences that allow them to make best use of their mechanical abilities.

MIQ	Interview Data	Comment on Face Validity
Achievement scale		
Being able to see the results of the work I do.	Whereas if their car was making noises around left-hand corners when it comes in and you fix it, they go for a drive and you're the best person in the world because you've fixed their car. You may have just tightened up a shockie, but you've achieved something for them in their eyes. So, when you get jobs like that it is really good, it's really really good (Participant 11).	Mechanical tradespeople relate "being able to see the results of the work I do" to their own personal observations, as well as the perspective of their customers, supervisors, or employers.
Being able to take pride in a job well done.	Yeah you get that bit of a kick out of it.. We had a, Monday morning we pulled an engine out of a helicopter that was in the training school and brought it over to our hanger because we had an aircraft with a bung engine. And the flight line coordinator said okay boys, I've booked the test flight for this for 2 o'clock this afternoon, so old engine out, new engine in, all connected ready to run, and yeah, all of us got a big kick out of it when it took off and flew at 2.15. And now it's out flying around everywhere. I found the engine that was broken to, which sort of was a little bit of a buzz there. Pilots complained about an issue … went through found it was starting, the internals, the oil pump was starting to fall apart, shrapnel all through the engine, it probably would have hand grenaded if it hadn't have been caught (Participant 13).	This independent inspector within the aviation industry talked of the pride of achievement associated with their work crew in relation to task completion time, level of achievement, and significance of the achievement for all involved.

MIQ	Interview Data	Comment on Face Validity
The feeling of accomplishment I get from the job.	Well, diagnostics is probably the most enjoyable thing for me, the actual swinging of spanners I didn't actually find that satisfying to be honest with you, but once you've repaired something and away it goes, that was satisfying I guess. Especially in the mining environment where time was money. Like on the rigs, if the rig shut down you'd be woken at bloody 2 o'clock in the morning, the whole rig completely shuts down and there's 30 people looking at you. A lot of pressure and that sort of stuff, and that was good, it was satisfying to get it running again. You earned your money out there. Good dollars but you were worth a lot more to the company that your wage tenfold so if you could get a rig going in 1 hour rather than 1 day, you might save them $100,000 (Participant 9).	This heavy diesel, heavy road transport mechanic talked of the sense of accomplishment that can be gained when working under pressure in a mining environment.
Variety scale		
Variety in my work.	The variety's good, the variety, it's never just the same thing, the same sort of stuff, it's a lot of old gear too, which is nice, not just to be working on, you actually get to get in and fix it and repair it, not just general servicing, so the full range of hands-on stuff I guess. We get some wilder stuff come through here and that's probably my favourite part of it (Participant 16).	This mechanical fitter talked about the enjoyment they experienced through the variety of work tasks they were involved in within the agricultural and heavy vehicle sector.

MIQ	Interview Data	Comment on Face Validity
The chance to do something different every day.	Sometimes it's not. No, it's good, like you meet a lot of people, because I do a lot of mobile stuff, so I'm quite often out and about, you get to do a lot of driving, time to yourself to think about things, yeah, that's basically, yeah it's something different every day you know, you're not doing, changing oil in filters, changing oil in filters, changing oil in filters (Participant 4).	The realistic nature of mechanical work includes not only different work tasks, but often different off-site work locations, when having to travel to machinery to work on it.
The chance to do many different things on the job.	We cover a fair and vast area. Every day there is something different. It's good. I love it. Yep. I enjoy getting out of bed, knowing that I'm coming to work to do something. Every day is different. A different challenge. And yeah you get a bit of different stuff (Participant 2).	When mechanical tradespeople in Australia talk of covering a fair and vast areas, they may actually be referring to a job that is several hundred kilometers away. They may need to drive or fly to the different locations to complete a vast array of mechanical tasks.
Compensation scale		
My pay and the amount of work I do.	I was obviously an apprentice, so they were exactly like what I expected. Yeah, but they're not too bad at the moment, I'm very happy with what I'm on, for what I do. As Damien stated, as your knowledge gets better on the equipment that you work on, so does your pay (Participant 1).	Mechanical tradespeople enter their occupation through a vocational education and training pathway. It is generally expected that they receive a training based wage whilst an apprentice, but that this wage increases incrementally with increase skill development and work capacity.
How my pay compares with that for similar jobs in other companies.	We're paid very well for what we do. Um, to be honest there would be very few jobs where I would be paid as well, do to what I do, well to be blunt, to do as little as I do (Participant 13).	This aviation mechanic compared their wage to jobs of their level in other companies. He had shifted companies within the aviation industry after considering wage opportunities based on their level of qualification.

MIQ	Interview Data	Comment on Face Validity
How my pay compares with that of other workers.	Um, something that is, that you also sort of not expecting, at the time, is the money that's in automotive industry is very very poor, considering the amount of knowledge that we do have to know across the board, like, as I said I haven't looked at all the other trades, personally I've spoken to a lot of tradesman as well, and in the automotive industry you need to know the most, you need to know and retain the most information of all the trades, and like the stuff that we're doing if we make a mistake, it could cost a life, it could cost three lives, like a car could go through a house, or something as opposed to like other trades where 9 times out of 10 it's just their own life at risk. We get paid the least amount out of all the trades, even though we are technically at a higher risk level than everyone else. So that is one thing that you're sort of not expecting, the money's very very not good (Participant 15).	In Australia, mechanical tradespeople within the automotive industry can talk of concern that their wage does not compare well to mechanical tradespeople in other industries, at similar skill levels.

MIQ	Interview Data	Comment on Face Validity
Security scale		
My job security	I've got a wife, I've got a family, I've got a nice house. You start going through recessions and where does your high-end performance go? That's one of the first to go, the first thing that drops off. My philosophy on life is pretty simple, is to live you have to eat, and who provides our food, it's farming. Farming is always going to be there, it's going to go through its ups and downs. Ag industry, I think it's the place to be. It still comes back to the very simple fact that we have to eat and globally we're a growth population. Resources are always going to ebb and flow, and that's on consumer demand, so mining, whatever else, building and cars all come back to natural resources, but the ag industry is always going to be there. We are always going to grow a crop. We're always going to grow a cow and we're going to grow a sheep (Participant 5).	This mechanic felt that employment as a mechanical tradesperson within the agricultural industry was secure, based on their reflections with past trends in times of global economic disturbances.
The way my job provides for a secure future.	The work was going to be there for the future, if you wanted to make money, it was always something that you can fall back on too (Participant 7).	This mechanical tradesperson was attracted to the profession as a stable skills base for future employment and financial security.

MIQ	Interview Data	Comment on Face Validity
The way my job provides for steady employment.	It's not the only skill I have, but it's one that I know gets rewarded. Like I, mean, I could go and get a job as a stud manager with cattle, because I know all of that as well. But I see less stresses in this game than in the rural game. Really, droughts used to just drive me, they would drive you to the wall, whereas this, in this sort of game that's probably where, I had a good talk one day to a fellow I used to know, because we had stud cattle, we would sell bulls and he'd go, he said, how you finding it? And I said oh yeah, no it's good. He said it's like selling a bull every fortnight isn't it. I said yep, and you don't have to feed them, you don't have to worry about selling them, because that's what was the pay packet. And um yeah, that's what is see is a big part about what I get enjoyment out of it, but I mean in staying in the job it is life, there's a mortgage and there's kids and stuff like that, at this present point in time (Participant 10).	Mechanical tradespeople who have rural and farming interests, can find employment as a mechanical tradesperson to be a more steady form of employment that income derived from self or family employment on a property.
Advancement scale		In blue collar work environments, like mechanical trades, advancement is not necessarily demonstrated through a traditional hierarchy of climbing a job ladder, rather based on technical and specialist skill development within their occupation.

MIQ	Interview Data	Comment on Face Validity
The job would provide an opportunity for advancement.	Yeah, so I did my trade, light vehicle mechanic, and then through Toyota they have their own training after that. Where you do diagnostics and more technical sort of stuff. I'm getting more and more as I progress, to start with I didn't as an apprentice. But now I'm doing a lot more customer related stuff, whether that's test-driving or showing them things, um yeah, so it's progressing more and more (Participant 14).	The job would provide an opportunity for skill advancement. Mechanical tradespeople talk of seeking opportunities for skill advancement within their work environments.
The opportunities for advancement on this job.	And career progression too, that was another thing that was important, was just that feeling of just not being stuck in the same spot, doing the same thing for the rest of my life. I work on aircrafts, I'm a helicopter technician and I've gone from working on the oldest helicopter in the Australian Army Fleet to the newest, and it's also the most advanced helicopter in the world. You don't have to just be there spinning spanners, you can move into maintenance, management, or even just team leading, like running teams, project management. I've done a cert 4 in project management since (Participant 13).	The opportunities for technical advancement on this job. This aviation mechanic talked of the variety of opportunities taken for technical advancement and their role in their career development.
The chances for advancement on this job.	So out of being a serviceman, doing like general repairs, into specialising in a field, that was really good (Participant 2).	The chances for specialised skill progression on this job. This mechanical tradesperson advanced from specialising in transmissions, to specialising on heavy machinery in the agricultural industry.

Table 9

Face Validity of the Work Effort Scale – 10 items (WESC-10)

WESC-10	Interview Data	Comment on Face Validity
Persistence		
I do not give up quickly when something does not work well.	We had a tractor here, that was bringing this error code up that was not really anything to do with what the actual problem was .. we went in to check, we replaced a whole heap of stuff, because they said, it could be this, it could be that, so you start changing things and bits and pieces, and it's something further on, you could be working on here, and the problems down here, but it's causing the symptoms up here (Participant 4).	The role of mechanical tradespeople can require persistence in relation to problem solving, with some work jobs taking months to resolve.
I really do my best to get my work done, regardless of potential difficulties.	I guess there's a bit of satisfaction, actually finding it in the end. Well, you've got to because that machines probably worth $100,000 that tractor and it was a $2000 computer in the end that was playing up. Yeah, you've just got to keep at it. It doesn't get any easier, it's probably gets harder. And it gets easier to make mistakes, to grab at the first thing that comes along and change that, and suddenly that was a $1000 down the drain that didn't fix it, and someone's ultimately got to pay for it (Participant 13).	Mechanical trade workers can expect difficulties associated with their vast range of tasks and often work autonomously. This worker talked of the satisfaction associated with maintaining high work standards.
WESC-10	Interview Data	Comment on Face Validity

When I start an assignment I pursue it to the end.	When you've got a real problem that when you've got two people, three people sitting in here trying to work out what it is, it's frustrating. A month ago, we spent basically six months just off and on trying to chase a problem with a tractor that they kept on saying basically we need to swap out, just swap this computer out, swap this computer out and ultimately at the end of the day the farmer can't afford that and the shop only holds certain stock. Eventually we got it but (Participant 3).	In the context of mechanical trade workers, "assignment" should be changed to "job". Across mechanical trade roles, workers are generally assigned job tasks related to particular machines, structures or assemblies.
Direction		
I do my best to do what is expected of me.	You feel a certain responsibility to do a good job, or the best job you can for them (Participant 3).	This mechanical trade person showed a sense of responsibility towards both the customer and the employer in relation to work expectations.
I am trustworthy in the execution of the tasks that are assigned to me.	As far as I'm concerned, honesty is the only policy to have. Be honest and say you've fucked up. People will respect you for that, rather than giving them some half-cocked story that isn't even remotely possible. So yeah, certainly honesty is the best policy for me. Admit your mistakes. What are people going to do? If they don't feel appeased by me, they can go talk to Matt, if Matt wants to come and kick my arse, I can say I've spoken to them, I've fucked up, I'm the first one to admit that I've fucked up, it's my fault (Participant 5).	This mechanical trade worker talked of trust required between himself and their employer in order to carry out the tasks required of their role.

WESC-10	Interview Data	Comment on Face Validity
I really do my best to achieve the objectives of the organisation.	I know that I can sleep at night, when I know customers think that I'm not out to rip them off, and that's my values, and that's important to me. My loyalty to ..(*the employers*).. means that I do the right thing by them. I talk about it like it's my business. When you've been here for 14 years, that's a long time and when it's a family business, say, whenever we're out and about, I always say we, and that just means that I think I'm part of something great. And for ..(*the* employers)… they're the ones that will benefit at the end of the day. I get job satisfaction and I get paid whatever, but you're making something great for them. They are going to leave a legacy for their kids, financially they are going to be on top of the world if everything keeps going the way it should be going and the direction that you hope it goes in (Participant 5).	I really do my best to achieve the objectives of my organisation. This mechanical trade worker discussed a sense of loyalty to the employer.
<u>Intensity</u> I think of myself as a hard worker.	Every time someone comes in, they've got a problem that they need sorted out. You can either sit there and say fuck, I've got to go and sort this shit out and get this tractor going, or you can say righto, we've got a problem, let's solve it, let's get the customer happy again (Participant 5).	Mechanical trade work can be seen as both intellectually and physically hard work.

WESC-10	Interview Data	Comment on Face Validity
I really do my best in my job.	Like for me, because I'd done the diesel fitting and then, and I was always, well why are we fixing this the same time, like every time and I wanted to find all that out. That's why I went to university got my engineering and went down the reliability field, but that's just me. It's more the brains trust of why that is doing that and let's look at why we're continually having that problem, righto let's eradicate that whole problem if we need to go down a different path. As I say, I've got that, I've always had that inquisitive nature. Where a lot of people would, ah well, it is what it is, nothing you can do about it, whereas there is. Let's do it once, and the second time we're going to improve and if that doesn't work we're going to try something different. Sometimes you just bury your head in the sand and it's not too bad, I'm not like that, whereas a lot of people do go down that path, it'll sort itself out type thing and that's not me, I've haven't got that type of personality (Participant 8).	This mechanical trade worker demonstrated a relationship between self-perceived personality traits and interest in improvement of work capacity.

WESC-10	Interview Data	Comment on Face Validity
I put a lot of energy into the tasks that I commence.	Yeah, so again going back into the mechanical fitting, which I hadn't done before the construction. Yeah just interpreting your drawings and stuff like that. I found that a challenge and then actually found out I probably knew a lot more than what other people did that have been doing it longer than me just because I thought I was behind to start with and so I actually spent the first few weeks just picking people's brains, research on the Internet how to read them, and by about three four months into my job I was leading hand teaching other people how to do it so (Participant 7).	The physical toll of mechanical trade work can present as a barrier in the work context. Mechanical trade workers may consider "energy" as physical energy, in addition to intellectual or emotional energy.
I always exert equally hard during the execution of my job.	I was just giving everything a go, just show them I was keen to do it really (Participant 18).	Mechanical tradespeople can use colloquial words and could find the statement "always exert equally hard during the execution of my job" wordy. They may also perceive exertion again, in this context, to relate to physical exertion. The question will be reworded to "My effort is always consistent while I am doing my job" in this context.

Conclusion

Thematic analysis of the participant interview data supported the proposed operationalisation of the integrative SCCT model of mechanical trade persistence as (a) satisfaction, (b) perceived organisational support, (c) mechanical trade self-efficacy, (d) sources of realistic self-efficacy, (e) outcome expectations, and (f) goal-directed activity. Table 10 presents a summary of the resultant Study One variable themes, codes, and operationalised SCCT constructs.

The interview data was used to support the selection, adaptation, and development of measures to best contextualise an integrative SCCT model of mechanical trade persistence for the purpose of Study Two. Table 10 also presents the corresponding Study Two measures that were scrutinised to determine the face validity of items within the mechanical trade context. Overall testing of the face validity for all proposed measures of the operationalised constructs was found to be satisfactory for inclusion in Study Two.

Table 10

Integrative SCCT Model of Mechanical Trade Persistence Theoretical Construct Themes, Codes, and Operationalised Construct Measures

SCCT Variable	Thematic Codes	Operationalised Construct	Study Two Measure
Satisfaction	Affective states	Job satisfaction Organisational satisfaction	Job Satisfaction Scale (JSS) Occupational Satisfaction Scale (OSS)
Contextual barriers and supports	Coworker support Customer expectations Difficult coworkers Dirty work Electric and hydraulic tasks Limited learning experiences Limited technological skills Organisational support Physical demands Repetitive tasks Supervisor support	Perceived organisational support	Adjusted Perceived Organisational Support Scale (Adjusted POS-13) comprising: Survey of Perceived Organisational Support (SPOS-4) Survey of Perceived Coworker Support (SPCS-4) Survey of Perceived Supervisor Support (SPSS-5)

SCCT Variable	Thematic Codes	Operationalised Construct	Study Two Measure
Mechanical trade self-efficacy	Mechanical trade self-efficacy	Mechanical trade self-efficacy	Mechanical Trade Self-Efficacy Scale
	Personal performance Positive affective states Verbal persuasion Vicarious exposure	Sources of realistic self-efficacy	Learning Experiences Questionnaire (LEQ) (Realistic Vicarious Learning, Realistic Verbal Persuasion scales)
Outcome expectations	Ability utilisation Achievement Advancement Autonomy Compensation Coworkers Responsibility Security Social service Social status Supervision Variety Working conditions	Outcome expectations	Minnesota Importance Questionnaire (MIQ) (Ability Utilisation, Achievement, Variety, Compensation, Security, Advancement scales)

SCCT Variable	Thematic Codes	Operationalised Construct	Study Two Measure
Personality and affective traits	Diligence Prudence Consistency of interest Persistence of effort	Goal-directed activity	The Work Effort Scale – 10 items (WESC-10)
Realistic interests	Realistic interests		

CHAPTER FIVE: STUDY TWO

The findings from Study One informed the development of a new measure of mechanical trade self-efficacy, and the selection and adaption of existing measures to operationalise the specified theoretical model. Study One assisted with informing the operationalisation of the core constructs of the SCCT in the domain of mechanical trade work in Australia. Study Two was developed in response to the need to test the relevance and usefulness of an integrative SCCT model of mechanical trade persistence in Australia, to explore and subsequently address factors related to attraction and retention within this occupational group. This chapter reports the empirical tests of an integrative SCCT model of mechanical trade persistence drawn from Lent et al.'s (2013) integrative SCCT model of persistence (represented in Figure 2): mapping pathways between (a) sources of realistic self-efficacy, (b) mechanical trade self-efficacy, (c) perceived organisational support, (d) outcome expectations, (e) goal-directed activity, (f) satisfaction, and (g) persistence intentions. A sample of 312 mechanical trade STEM workers completed the survey which used psychometric measures to operationalise the core variables determined through domain specific research conducted in Study One.

The results of Study Two are presented alongside data screening and plans for analysis. The measurement properties of the survey measures were discussed, with particular attention to the new mechanical trade self-efficacy measure. Additionally, measures of satisfaction and persistence are posited. The four core SCCT outcome variables of job satisfaction, occupational satisfaction, job withdrawal intentions, and occupational withdrawal intentions were examined utilising hierarchical regression according to the proposed integrative SCCT model of mechanical trade persistence. Overall model-fit was further investigated through path and mediation analyses. Overall findings in relation to the

relevance of an integrative SCCT model of persistence in the mechanical trade domain was then presented.

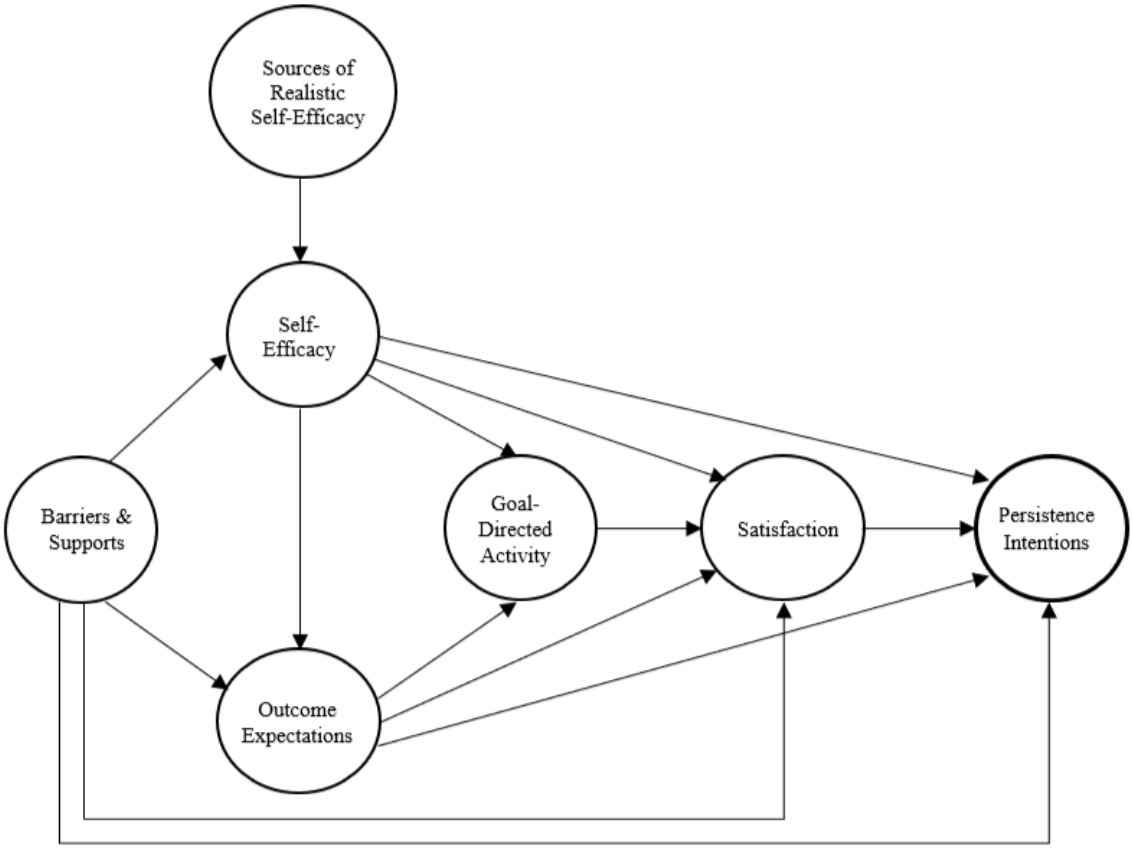
Model and Corresponding Hypotheses

Figure 11 represents the theorised integrative SCCT model of mechanical trade persistence to be investigated in Study Two. The proposed integrative SCCT model of mechanical trade persistence will enable testing of the following hypotheses in relation to the core variables:

1. Mechanical trade self-efficacy positively predicts satisfaction.
2. Mechanical trade self-efficacy is indirectly associated with satisfaction through outcome expectations.
3. Mechanical trade self-efficacy is indirectly associated with satisfaction through goal-directed activity.
4. Mechanical trade self-efficacy positively predicts persistence intentions.
5. Mechanical trade self-efficacy is indirectly associated with persistence intentions through outcome expectations.
6. Mechanical trade self-efficacy is indirectly associated with persistence intentions through satisfaction.
7. Outcome expectations positively predict satisfaction.
8. Outcome expectations are indirectly associated with satisfaction through goal-directed activity.
9. Outcome expectations positively predict persistence intentions.
10. Outcome expectations are indirectly associated with persistence intentions through satisfaction.
11. Satisfaction positively predicts persistence intentions.

Figure 11

An Integrative SCCT Model of Mechanical Trade Persistence



Method

This section presents an overview of Study 2 participants, including eligibility criteria and sampling. A description of the recruitment procedures, ethical considerations and the psychometric instruments used to measure an integrative SCCT model of mechanical trade persistence constructs are also provided.

Participants

The survey recruitment criteria stipulated that each participant self-identify as a working mechanical trade apprentice or fully qualified mechanical tradesperson, aged 18 years and over, including, but not limited to automotive, light and heavy vehicle mechanics; motorbike and aviation mechanics; diesel mechanics; mechanical fitters and technicians. Additional criteria stipulated that participants were employed in associated mechanical trade roles in Australia. Three-hundred and two eligible mechanical tradespeople provided complete, valid responses to the survey. Two hundred and ninety-one (96.4%) participants provided demographic data that will be presented as representative of the sample.

Participants were aged between 18 years and 75 years (M = 37.8, SD = 13.7), with 97% of the sample identifying their gender as male and 3% identifying their gender as female. In addition, 95.4% participants identified as Australian citizens, 0.3% as temporary residents, and 0.7% permanent residents. On average, participants had worked for 19 years in their occupation (SD = 13.9), with time in occupation ranging from half a year to 59 years. In addition, reported length of employment with the current employer ranged from three months through to 49 years (M = 6.8, SD = 7.9). Income estimates for this group were also varied, with 2% earning less than $24,000 per year, 13.2% earning $24,000-$45,000 per year, 35.4% earning $45,000 to $83,000 per year, 20.2% earning $83,000 to $100,000 per year, 10.6% earning $100,000 to $120,000, 13.9% earning $120,000 plus per year, and 2% preferring not to answer.

The qualifications level identified by the sample included 7.9% apprentice, 40.1% qualified mechanical tradesperson, 37.4% qualified tradesperson with specialised industry skill accreditation, and 11.9% qualified mechanical tradesperson with additional diploma or degree. The tradespeople also identified their employment as supporting the following industries, 12.3% Agriculture, Forestry and Fishing, 20.5% Mining, 8.3% Manufacturing, 4% Electricity, Gas, Water and Waste Services, 7.3% Construction, 30.1% Retail Trade, 8.9% Transport, 0.3% Education, and 2.6% Public Administration and Safety. As classified by the Australian Statistical Geography Standard (ASGS-RA), the job location remoteness classifications of the sample were distributed as: major cities of Australia 34.4%, inner regional Australia 27.5%, outer regional Australia 23.8%, remote Australia 8.3%, very remote Australia 1.7%.

Procedure

Online and paper versions of the survey and participant materials were developed. These materials included the full survey, where demographic data was collected alongside responses to variable related survey items. Participant and prize draw information were also provided via both versions of the survey. The online survey, the Australian Survey of Mechanical Trade Careers was developed within the Lime Survey Tool and has been included in Appendix B. Prior to release of the survey package an employer in the agricultural machinery sector was consulted to obtain feedback in relation to the face validity of the survey items.

Participant recruitment occurred over a two-month period, utilising my developed networks, canvassing and paid advertising opportunities. Both paper and electronic handouts were developed, using simple language and cartoon images to promote participation in the survey. A short, animated video and an animated GIF were also developed, using the same simple language and cartoon images as the handouts. An associated Facebook page was

developed under USQ Mechanic Survey and the survey itself was promoted as the Australian survey of mechanical trade careers. Twitter was an additional social network that was utilised in order to promote the survey material.

Contact was made with AGCO Australia to promote the survey to their Australian training and human resources managers. AGCO Australia are the master company of an Australian wide network of agricultural machinery dealerships, who employ mechanical tradespeople. The AGCO staff assisted with disseminating paper copies of the survey to mechanical tradespeople who had travelled from dealerships to the AGCO training courses. Thirteen paper surveys were completed across two training days through this network. Additionally, the dealer principals of businesses within the AGCO network were contacted to disseminate promotional information to their mechanical trade staff in the towns of Toowoomba, Warwick, Kingaroy, Bundaberg, Darwin, Goulburn, and Albany.

A Facebook advertising campaign was launched through the USQ Mechanic Survey page, to promote the survey short video animation and video GIF. The promotion was directed towards Australians and encouraged mechanical tradespeople to “take the Australian survey of mechanical trade workers.” The advertising material was promoted to Australians who had appropriate domain links within their Facebook information, such as: job titles including mechanic, mechanical, diesel, fitter, technician, aviation mechanic, heavy vehicle mechanic; automotive dealership employers including Mazda, Hyundai, Holden, Toyota, Honda, BMW, Audi, Landrover, Subaru, Kia, and Nissan; mining employers including BHP Billiton, Thiess, Rio Tinto, Xstrata, Downer; mining and industrial locations including Port Hedland, Karratha, Pilbura, and Blue Toro; agricultural employers including John Deere, Wideland Ag, Vanderfield, AACo, and Massey Ferguson; aviation employers whose business names included words such as aviation, air, and aerospace.

Overall, the Facebook "Australian Survey of Mechanical Trade Careers" advertisement set of GIF and short animation, both with Lime Survey Tool link attached, received 46,862 views by potentially suitable survey participants over a two-month period. The GIF was viewed at least once by 22,595 potential survey participants, and the short animation viewed at least once by 27,168 potential survey participants. There were 2,179 individual link clicks leading to the USQ Survey Tool participant information page, which included eligibility, participant and ethical information to prior entering the survey. Five hundred and nineteen people entered the Lime Survey via Facebook advertised survey marketing.

In addition, phone, email and social media contact was made with a variety of apprenticeship and employment agencies in order to promote survey participation. This included networking with labour hire and recruitment agencies specialising in trades, agriculture and mining and following leads to employers. Special interest groups whose members were likely to be eligible to participate in the survey were also approached, such as Tradeswomen Australia. Large motoring groups and dealer networks in Australia such as Mazda, Hyundai, Holden, Toyota, Honda, BMW, Audi, Landrover, Subaru, Kia, and Nissan were approached regarding participation in the research, as were motoring clubs such as RACQ, NRMA, AANT, RAA, RACT, RACWTA, RACV.

Ethical Considerations

Study Two was reviewed under a research project proposal by the University of Southern Queensland Human Research Ethics Committee prior to any participant recruitment (Ethics Project Code: H18REA022). Careful ethical consideration associated with the collection of data included a process of informed consent with each participant regarding the nature and purpose of the research, conditions around participation, the right to withdraw,

expected benefits and risks, information regarding the participant prize draw, bounds of confidentiality, and consent.

Participants were informed that Study Two was specifically aimed towards no more than 300 mechanical trades workers (i.e., diesel fitters and mechanics), employed across a range of industries, across all areas of Australia. Participants were also informed that the purpose of the project was to investigate personal career-related factors, such as occupation specific beliefs, expectations, interests, and personality variables that attract and retain individuals within STEM occupations. Participants were informed that the research team requested their assistance because there are national skills shortages of mechanical trades workers across industry, in the context of technological changes and increasing production demands.

Additionally, participants were informed that their involvement in the was project was entirely voluntary. They were informed that if they did not wish to take part they were not obliged to. They were informed that if they decided to take part and later changed their mind, they were free to withdraw from the project at any stage. Participants were also informed that their decision whether to take part, to not take part, or to take part and then withdraw, would in no way impact their current or future relationship with USQ, the principal researcher, or their employer. Participants were informed that there were no anticipated physical, economic or legal risks to participating in this research project, beyond those associated with normal day-to-day life. It was appreciated that time inconvenience was involved with participation in this project.

Participants were informed that there were no immediate benefits from participation in this research. They were provided with information regarding both the short- and long-term anticipated benefits of participation in the research. In addition, participants were

informed that between 1 August 2019 and 30 October 2019, they could opt-in to enter a prize draw for one of eight $100 Visa Gift Cards.

Participants were informed that any data collected as a part of this project would be stored securely as per USQ's research data management policy. Participants were informed that individual results would not be reported, and that a summary of the results of this project may be reported to them as a participant, as well as interested employers. Participants were informed that summarising and reporting of de-identified results would be managed according to the nature of information requested and managed through the university, under direct supervision of the Research Director of the Australian Collaboratory for Career, Employability, and Learning for Living (ACCELL). Finally, participants were informed that Study Two formed part of a larger program of research, which the I would present as a PhD thesis.

Measures

The operationalised constructs of this study were: (a) mechanical trade self-efficacy, (b) sources of realistic self-efficacy, (c) perceived support, (d) outcome expectations, (e) work effort, (f) satisfaction, and (g) persistence intentions. The items of each measure were utilised as observed variables acting as indicators of the models' latent constructs. The measures are described below.

Withdrawal Intentions. While job withdrawal intentions relate to a worker's current employment role with a specific employer, occupational withdrawal intentions relate to withdrawal from the trade career as a whole.

***Job Withdrawal Intentions*.** Job withdrawal intentions were measured using an adjusted version of the 3-item Job Withdrawal Cognitions scale (Blau, 1985). The 3-item Job Withdrawal Intentions scale asked participants to indicate their level of agreement with the following three statements in relation to their current job, "I am thinking about leaving my

current job," "I am actively searching for an alternative to my job," and "I intend to stay in my current job for some time." The items were rated on a 5-point Likert type scale from (1) *strongly disagree* to (5) *strongly agree*. The original measure demonstrated acceptable internal consistency reliability (α = .70). For the current study the 3-item Job Withdrawal Intentions scale possessed adequate internal consistency reliability (α = .91). The mean inter-item correlation was also acceptable at $r = 0.77$.

***Occupational Withdrawal Intentions*.** Occupational withdrawal intentions were measured using an adjusted version of the 3-item Career Withdrawal Intentions measure (Blau, 1985). The 3-item Occupational Withdrawal Intentions scale asked participants to indicate their level of agreement with the following three statements in relation to their current occupation as a mechanical tradesperson, "I am thinking about leaving my current occupation as a mechanical tradesperson," "I am actively searching for an alternative to working as a mechanical tradesperson," and "I intend to stay working as a mechanical tradesperson for some time." The items were rated on a 5-point Likert type scale from (1) *strongly disagree* to (5) *strongly agree*. The original measure demonstrated acceptable internal consistency reliability (α = .67). For the current study the 3-item Occupational Withdrawal Intentions scale possessed adequate internal consistency reliability (α = .91). The mean inter-item correlation was also acceptable at $R = 0.77$.

Satisfaction. Consistent with measurement of both job and occupational withdrawal intentions, both job and occupational satisfaction were measured. Job satisfaction related to a worker's current employment role with a specific employer, while occupational withdrawal intentions related the persons trade career as a whole.

Job Satisfaction. Job satisfaction was measured using the 5-item Job Satisfaction scale (Judge et al., 1998). This scale is a short version of the Brayfield and Rothe (1951) Index of Job Satisfaction. The 5-item Job Satisfaction scale asks participants to indicate their

level of agreement with affective statements such as “I feel fairly well satisfied with my present job,” “Most day I am enthusiastic about my work,” and “Each day of work seems like it will never end.” The items were rated on a 7-point Likert type scale from (1) *strongly disagree* to

(7) *strongly agree*. The measure demonstrated acceptable internal consistency reliability (α = .88; Judge et al., 1998) . For the current study the 5-item Job Satisfaction scale possessed adequate internal consistency reliability (α = .85). The mean inter-item correlation was also acceptable at $r = 0.56$.

Occupational Satisfaction. Occupational satisfaction was measured using an adjusted version of the 3-item Occupational Satisfaction scale (Meir et al., 1990). The original scale included two Likert type scale items and an open-ended question as to whether the participant would prefer to choose another job. For the purpose of the current study, the third question was also converted into a Likert type response. The adjusted 3-item Occupational Satisfaction scale asked participants to indicate their level of agreement with the following three statements “I am satisfied with my choice of occupation,” “I truly enjoy the occupation I have chosen,” and “Given another opportunity to choose careers, I would choose differently.” The items are rated on a 7-point Likert type scale from (1) *strongly disagree* to (7) *strongly agree*. The original measure demonstrated acceptable internal consistency reliability (α = .78; Meir et al., 1990). For the current study the 3-item Occupational Satisfaction scale possessed adequate internal consistency reliability (α = .84). The mean inter-item correlation was also acceptable at $r = 0.65$.

Perceived Organisational Support. The perceived organisational support factor was measured using adjusted versions of the Survey of Perceived Organisational Support (SPOS; Eisenberger, Huntington, Hutchinson, & Sowa, 1986; Shanock & Eisenberger, 2006) to

measure Perceived Organisational Support, Perceived Supervisor Support, and Perceived Coworker Support (Hayton et al., 2012).

Perceived Organisational Support. The adjusted Perceived Organisational Support measure consisted of 4 items that measure individual's support perceptions in relation to their organisation, such as "My organisation shows very little concern for me" and "My organisation strongly considers my goals and values." Participants are asked to think about their current workplace experiences and rate each statement on a 7-point Likert scale from (1) *strongly disagree* to (7) *strongly agree*. The adjusted Perceived Organisational Support scale demonstrates good internal consistency reliability (α = .82; Hayton et al., 2012). For the current study the 4-item Perceived Organisational Support scale possessed adequate internal consistency reliability (α = .92). The mean inter-item correlation was also acceptable at *r* = 0.740.

Perceived Supervisor Support. The adjusted Perceived Supervisor Support measure consisted of five items that measure individual's support perceptions in relation to their supervisor, such as "My supervisor really cares about my well-being" and "My supervisor takes pride in my accomplishments at work." Participants are asked to think about their current workplace experiences and rate each statement on a 7-point Likert scale from (1) *strongly disagree* to (7) *strongly agree*. The adjusted Perceived Coworker Support scale demonstrates good internal consistency reliability (α = .84; Hayton et al., 2012). For the current study the 5-item Perceived Supervisor Support scale possessed adequate internal consistency reliability (α = .95). The mean inter-item correlation was also acceptable at *r* = 0.78.

Perceived Coworker Support. The adjusted Perceived Coworker Support measure consisted of four items that measure individual's support perceptions in relation to their coworkers, such as "My coworkers really care about my well-being" and "My coworkers

value my contribution to their well-being." Participants are asked to think about their current workplace experiences and rate each statement on a 7-point Likert scale from (1) *strongly disagree* to (7) *strongly agree*. The adjusted Perceived Coworker Support scale demonstrates good internal consistency reliability (α = .88; Hayton et al., 2012). For the current study the 4-item Perceived Organisational Support scale possessed adequate internal consistency reliability (α = .76). The mean inter-item correlation was also acceptable at r = 0.74.

Mechanical Trade Self-Efficacy. A new measure specific for this study was developed in accordance with Lent and Brown's (2006b) measurement guide for conceptualising and assessing social cognitive constructs in careers research. The new items were drawn from Study One. The face validity of these items were analysed and confirmed by the mechanical trade participants in Study One.

Development of the Mechanical Trade Self-Efficacy scale (MTSES) measure was based on interview data collected in Study One and mechanical trade position task information from the O*Net Online database. The scale consisted of seven items describing typical activities that are performed across a range of mechanical trade jobs across industries. The content for the items was sourced from the O*Net Online database descriptions of mechanical trade tasks across a variety of mechanical trade occupations.

Participants were instructed to consider activities that are typically performed by mechanical tradespeople across industry and job roles, requiring the use of many skills and performance of a range of tasks of varying complexity. Participants were asked to rate each item on a 5-point Likert Scale from (1) *not confident at all* to (5) *completely confident*. Example items included "I can inspect and test mechanical parts of vehicles, equipment or structures (for example, cars, tractors, trucks, earth moving equipment, buses, motorbikes, helicopters, pumps, rigs, assemblies and plant)," "I can diagnose and repair mechanical components of vehicles or equipment (for example, engines, gearboxes, transmissions,

brakes, filters, clutches, power, steering, hydraulics, sub-assemblies and mechanical systems)," and "I can use tools, instruments and equipment to perform mechanical tasks (for example, screwdrivers, pliers, wrenches, pressure gauges, precision instruments, micrometers, callipers, calibration devices, power tools, jacks and hoists). The MTSES showed good internal consistency reliability (α = .84). The mean inter-item correlation was also acceptable at $r = 0.44$.

Sources of Realistic Self-Efficacy. Sources of realistic self-efficacy were measured using an abbreviated version of the Learning Experiences Questionnaire (LEQ; Schaub & Tokay, 2005). For expediency, two Realistic RIASEC subscales were selected for inclusion, to measure Vicarious Learning and Verbal Persuasion experiences. Sources of realistic self-efficacy was not theorised as a core variable within the current study and as such, for economy, only two of the four scales were selected in order to maximise the chances of respondents completing the full survey.

The Realistic Vicarious Learning subscale included items such as "While growing up, I watched adults whom I respect fix things," and "I observed people whom I respect repair mechanical things." The Realistic Verbal Persuasion subscale included items such as "While growing up, adults I respected encouraged me to work with tools" and "People I respect have urged me to learn how to fix things that are broken. For both subscales, respondents were asked to consider experiences where they had observed others working practically, or others had encouraged them to work practically and to rate each items on a 6-point Likert scale from (1) *strongly disagree* to (6) *strongly agree* as to whether they had had these types of learning experiences as a mechanical tradesperson.

The Total Realistic Learning Experience scales of the LEQ demonstrate good internal consistency reliability (α = .89; Schaub & Tokar, 2005) . For the current study the 5-item Realistic Vicarious Learning subscale possessed adequate internal consistency reliability

(α = .87). The mean inter-item correlation was also acceptable at *r* = 0.57. The 5-item Realistic Verbal Persuasion subscale possessed adequate internal consistency reliability (α = .86). The mean inter-item correlation was also acceptable at *r* = 0.55.

Outcome Expectations. Outcome expectations were operationalised as vocational values measured using adapted scale items of Ability Utilisation, Achievement, Variety, Compensation, Security, and Advancement from the Minnesota Importance Questionnaire (MIQ; Rounds, 1981). Lent et al. (2013, p. 4) stated that "the MIQ assesses work needs/values that can be formatted as outcome expectations," adapting measure items from an online version of the MIQ. The MIQ has been shown to be a stable and reliable instrument, demonstrating median reliability coefficients from α .77 to .81 across the MIQ scales (Rounds et al., 1981). The original MIQ scale technical data indicated that the MIQ scales had sufficient internal consistency reliability to meet usually accepted standards, however the reliability coefficients were not reported (Gay, 1971).

For the present study, MIQ work needs, or work environment reinforcement systems were converted to equivalent values scales. The original item wording was retained in relation to the MIQ statements. In order to adapt the scales to the assessment of outcome expectations, respondents were instructed to rate the statements in relation to their importance regarding their work as a mechanical tradesperson.

Ability Utilisation. The adjusted Ability Utilisation measure consisted of three items from the Ability Utilisation needs scale of the MIQ that measured individual's need to do something that makes use of their abilities. Participants were asked to rate items such as "The chance to do the kind of work that I do best" and "The chance to do work that is well suited to my abilities" on a 5-point Likert scale from (1) *not important* to (5) *very important.* For the current study the 3-item Ability Utilisation scale possessed adequate internal consistency reliability (α = .66). The mean inter-item correlation was also acceptable at *r* = 0.40.

Achievement. The adjusted Achievement measure consisted of three items from the Achievement needs scale of the MIQ that measured individual's need to experience a feeling of accomplishment within their job. Participants were asked to rate items such as "Being able to see the results of the work I do" and "Being able to take pride in a job well done" on a 5-point Likert scale from (1) *not important* to (5) *very important.* For the current study the 3-item Achievement scale possessed adequate internal consistency reliability ($\alpha = .69$). The mean inter-item correlation was also acceptable at $r = 0.44$.

Variety. The adjusted Variety measure consisted of three items from the Variety needs scale of the MIQ that measured individual's need for daily variety within their job. Participants were asked to rate items such as "The chance to do something different every day" and "The chance to do many different things on the job" on a 5-point Likert scale from (1) *not important* to (5) *very important.* For the current study the 3-item Variety scale possessed adequate internal consistency reliability ($\alpha = .80$). The mean inter-item correlation was also acceptable at $r = 0.58$.

Compensation. The adjusted Compensation measure consisted of three items from the Compensation needs scale of the MIQ that measured individual's need for pay that would compare well with other workers. Participants were asked to rate items such as "How my pay compares with similar jobs with other companies" and "How my pay compares with that of other workers" on a 5-point Likert scale from (1) *not important* to (5) *very important.* For the current study the 3-item Compensation scale possessed adequate internal consistency reliability ($\alpha = .75$). The mean inter-item correlation was also acceptable at $r = 0.52$.

Security. The adjusted Security measure consisted of three items from the Security needs scale of the MIQ that measured individual's need for a job that would provide for steady employment. Participants were asked to rate items such as "The way my job provides for a secure future" and "My job security" on a 5-point Likert scale from (1) *not important* to

(5) *very important.* For the current study the 3-item Security scale possessed adequate internal consistency reliability (α = .76). The mean inter-item correlation was also acceptable at $r = 0.52$.

Advancement. The adjusted Advancement measure consisted of three items from the Advancement needs scale of the MIQ that measured individual's need for a job that would provide an opportunity for advancement. Participants were asked to rate items such as "The job would provide an opportunity for skill advancement" and "The opportunities for technical advancement in this job" on a 5-point Likert scale from (1) *not important* to (5) *very important.* For the current study the 3-item Advancement scale possessed adequate internal consistency reliability (α = .82). The mean inter-item correlation was also acceptable at $r = 0.60$.

Goal-Directed Activity. Goal-directed activity was measured using the Work Effort Scale (WESC; De Cooman, et al., 2009). The scale consists of 10 items describing measures of persistence, direction and intensity of work effort. Participants are asked to rate each item on a 7-point Likert Scale from (1) *strongly disagree* to (5) *strongly agree*. Example items included "I do not give up quickly when something does not work well," "When I start a job I pursue it to the end," and "I do my best to do what is expected of me."

The total work effort scale demonstrates good internal consistency (α = 0.90). In addition to the total work effort score, the WESC can be further divided into three subscales: persistence (3 items), direction (3 items) and intensity (4 items) that demonstrate acceptable internal consistency reliability (α = .78, .81 and .85 respectively) (De Cooman et al., 2009). For the current study the 10-item WESC possessed adequate internal consistency reliability (α = .87). The mean inter-item correlation was also acceptable at $r = 0.42$.

Plan for Data Analysis

All statistical analyses in Study Two were conducted using the IBM SPSS Statistics (Version 26) and IBM SPSS AMOS (Version 26) programs. The statistical analyses in the present study included confirmatory factor analysis (CFA) and hierarchical multiple regression analysis. Where possible, CFA was used to interrogate the factor structure for the measures in the current study. This was considered an analytical priority due to the use of a previously untested measure of mechanical trade self-efficacy, adaptation of measures for the current study, and the use of existing measures in a new context as per Lent and Brown (2006b) recommendations. Secondly, the core hypotheses of the proposed integrative SCCT model of mechanical trade persistence were tested using a process of hierarchical multiple regression analysis, path analysis, and mediation analysis regarding the core relationships within the model. Structural equation modelling was attempted, but there was insufficient power to run the model.

Theory-driven CFA using a maximum likelihood estimator was used to interrogate the factor structure of the study measures (Kahn, 2006; Mvududu & Sink, 2013). CFA has widespread use in scale-development research, contributing to test development and validation (Kahn, 2006). Utilisation of this statistical tool assisted with the process of testing the theoretically derived hypotheses related to the variable constructs, determining the extent to which the hypothesised factor structure provided fit to the data (Kahn, 2006). AMOS has a built-in full information maximum likelihood procedure to estimate the values of the missing data (Mvududu & Sink, 2013).

In relation to both the CFAs and regression analyses, the following model fit statistics were inspected: the chi-square (χ^2) test, the comparative fit index (CFI), Tucker-Lewis index (TLI) and the root-mean square error of approximation (RMSEA) (Schreiber et al., 2006). A non-significant chi-square ($p < .05$) is desired in order to indicate data fit, with .95 or greater

deemed acceptable in relation to support for the model (Kahn, 2006). The CFI and TLI scores can be assessed as indicating acceptable or good fit if they exceed .90 or .95 respectively (Mvududu & Sink, 2013; Schreiber et al., 2006). RMSEA scores with a value .06 to .08 indicates good fit, .08 to .1 indicates adequate fit, and greater than .10 poor fit (Kahn, 2006; Mvududu & Sink, 2013; Schreiber et al., 2006).

Hierarchical multiple regression analysis allowed the assessment of the relationships between the dependant variables and independent outcome variables of job satisfaction, occupational satisfaction, job withdrawal intentions, and occupational withdrawal intentions according to the integrative SCCT model (Meyers et al., 2006; Tabachnick, 2013). Sequential hierarchical multiple regression was used in this study, as the order that the variables were entered in the model related to the theoretical measurement model (Meyers et al., 2006).

Path analysis was used to assess the direct and indirect effects of the social cognitive variables that were theorised to be predictive of the outcome variables in the SCCT model (Meyers et al., 2006). Path analysis allowed evaluation of the level to which the predictive model fit the data based on the results of the analysis (Meyers et al., 2006). SPSS AMOS uses an iterative maximum likelihood procedure for model-fitting (Meyers et al., 2006).

The path analyses were performed by combining the separate regression data for each of the dependant outcome variables of the SCCT with the theorised measurement model (Meyers et al., 2006). Thus, the information concerning the interrelationships between all the variables was entered into the integrative model simultaneously (Meyers et al., 2006). The model-fitting approach then allowed for respecification, where paths were not significant respecification includes removal of these paths to allow a more accurate explanation of the model (Meyers et al., 2006).

The model fitting approach also included consideration for the effects of mediator relationships within the model (Meyers et al., 2006). Mediation occurs when the strength of

the relationship between a predictor variable and an outcome variable is reduced by including another variable as a predictor (Field, 2013). Mediation would occur if the relationship between the predictor and outcome was significant (below .05) when observed in an initial model, but not significant when the mediator is included as well.

Hayes PROCESS tool (Model 4) was utilised in order to conduct mediator analysis in relation to the model hypotheses (Hayes, 2018). The PROCESS tool uses ordinary least squares regression for model estimation, providing a modern test of the inference about indirect effect size of a model with a mediation component, using percentile bootstrap confidence interval (Hayes, 2018). This allowed a pairwise comparison between the specific indirect effects within the mediator model.

Results

Data Screening

This section describes the strategic stages of preliminary diagnostic analysis used to screen the data, handle missing data, and evaluate the ability of the data to meet assumptions required for the statistical analyses used. All observed items were measured on Likert scales that contained between five and seven discrete categories and were treated as ordered categorical variables. A negative skew was noted across all variables in the data set. Tabachnick (2013) indicates that while normally distributed variables enhance analyses solutions, normality assumptions regarding the distributions of variables need not be enforced, potentially weakening an analysis rather than invalidating it. As such, there was no requirement to transform the skewed data in relation to this study.

Descriptive statistics for the data set are reported with the correlational data between all variables measures and between items for the new mechanical trade self-efficacy measure. Regression techniques can be applied to a data set where the independent variables are correlated with both one another and the dependant variable, with the goal of arriving at a set

of regression coefficients for the independent variables (Meyers et al., 2006; Tabachnick, 2013). Multicollinearity can, however, distort the results and therefore the between variable correlations were examined for correlations in excess of .85 (Mvududu & Sink, 2013).

Upon entering the original data file into SPSS, the data was screened for accuracy (Meyers et al., 2006; Tabachnick, 2013). The size of the data set enabled this to be accomplished by a visual inspection process including review of raw data, frequency tables, histograms and box plots (Meyers et al., 2006). The verification process included review of the legitimateness of the numerical code values across cases and appropriateness of measurement scale code values (Meyers et al., 2006; Tabachnick, 2013). The process of value screening and cleaning resulted in several outcomes, including confirming that the values were correct and taking no action, deeming the value to be wrong without an appropriate replacement and treating it as a missing value, and considering data points for elimination on the proposition that they were not representative of the target population under study (Meyers et al., 2006).

The data file was then visually scrutinised to detect possible sources of missing data. Patterns of missing data can be categorised as unpredictable and missing completely at random (MCAR), a predictable non-response related to a variable but missing at random (MAR), or missing not at random or nonignorable (MNAR) (Meyers et al., 2006; Tabachnick, 2013). It is considered that less than 5% of data missing in relation to a particular variable could be tolerated for the current sample (Tabachnick, 2013). The simple decision was made to drop any case where the missing data fell outside of this range for the current study. Meyers et al. (2006) recommended the use of listwise deletion where there are small numbers of missing values, which is consistent with the use of the SPSS program.

As the survey was expected to take participants approximately 10 minutes to complete and was a comprehensive set of occupational questions, it was expected that a proportion of

respondents would exit the survey before completing it entirely. Additionally, the online survey was designed so that a response was required for each item within a set of questions, before proceeding to the next (e.g., participants were required to respond to all job satisfaction questions before proceeding to the occupational satisfaction questions). For the purpose of this study, a simple procedure for handling missing values was to exclude any cases where the full survey was not completed by the participant (Tabachnick, 2013).

An unexpected type of missing data detected related to an error with the programming of the survey within the Lime Survey Tool. The sources of mechanical trade self-efficacy questions were not identified as necessary and, as such, it was noticed that several respondents could proceed through the full survey without responding to these items. The data set was also reviewed for scoring errors, that consequently would need to be treated as missing data. This included response errors related to reverse-scored items, as well as errors related to limits with participant attendance when responding to the items.

In order to identify univariate outliers, the values for each variable were transformed into standard *z* scores. Cases with standardised scores with a deviation in excess of ± 3.29 were identified as potential univariate outliers (Field, 2013; Tabachnick, 2013). While single-construct univariate outliers were detected in the data set they were not considered error outliers, rather, upon further visual inspection of the data set were considered interesting, representative cases and therefore retained (Aguinis et al., 2013; Meyers et al., 2006; Tabachnick, 2013).

Multivariate outliers were then identified by computing each case's Mahalanobis distance (Meyers et al., 2006; Tabachnick, 2013). The Mahalanobis distance values were evaluated with a chi-square (χ^2) distribution with degrees of freedom (*df*) equal to the number of observed variables and subsequently evaluated with an alpha level (α) of $p < .001$ (Meyers et al., 2006; Tabachnick, 2013). The multiple-construct cases identified as multivariate

outliers were removed to limit the adverse effects of extreme values on the regression analyses (Aguinis et al., 2013; Meyers et al., 2006).

Critical visual inspection of both demographic and variable data for legitimacy of the initial cases led to the removal of all partial cases (n = 117) from the survey data set, leaving 312 cases. Review of the demographic data against inclusion criteria let to the removal of five additional cases (Participants 88, 177, 290, 299, and 432) who were not working as mechanical tradespeople at the time of survey completion and therefore were not representative of the target population under study. All remaining observed items were screened for incorrect values. Two cases (Participants 101 and 125) demonstrated error by indicating numbers greater than 200 with their current employer. These responses were removed and coded as MAR missing data.

Reverse scoring of items was completed as required for the survey measures. Errors related to inattention to reverse scoring were coded as MAR missing data for the following cases where the error was only noted against one variable: Perceived Organisation Support (Participants 84, 221, 334, 512, and 515), Perceived Supervisor Support (Participants 4 and 520), Job Satisfaction (Participant 238), Occupational Satisfaction (Participants 303 and 437), Withdrawal Intentions Job (Participants 63 and 252), and Withdrawal Intentions Occupation (Participants 327 and 506). An additional five cases (Participants 112, 153, 228, 267 and 523) demonstrated reverse scoring inattention across more than one variable and therefore were not tolerated in terms of missing data limits.

Due to an error in programming the Lime Survey Tool, three participants responded to the complete survey however were randomly missing the data in relation to the realistic learning experience and realistic verbal learning variables. In two of these instances (Participants 132 and 159) a missing data value was included as all other data within the participants profiles were intact. The other instance (Participant 349) was removed from the

data set, as this case also had missing data in relation to reverse scoring inaccuracies within the Perceived Supervisor Support variable.

Screening for univariate outliers identified multiple instances of statistically significant outlier cases that were handled by data retention. Four cases were identified as univariate outliers in relation to Realistic Verbal Learning experiences (Participants 147, z = -4.82911; 470, z = -3.66005; 238, z = -3.66005; 362, z = -3.66005). One case was identified as a univariate outlier in relation to Mechanical Trade Self-Efficacy (Participant 230, z = -3.62115). The following univariate outliers were identified within the Outcome Expectation variables: Ability (Participants 170, z = -3.46450; 521, z = -3.46450; 438, z = -3.46450; 427, z = -3.46450; 505, z = -3.46450); Achievement (Participant 247, z = -3.69474); Variety (Participants 362, z = -3.59454; 220, z = -3.59454; 436, z = -3.59454); Compensation (Participant 490, z = -3.54443); Security (Participant 406, z = -3.74068); and Advancement (Participants 406, z = -4.12473; 436, z = -4.12473). Three cases were identified as univariate outliers in relation to Work Effort (Participants 439, z = -4.15067; 266, z = -3.71779; 448 = z = -3.71779) and three in relation to Job Satisfaction (Participants 448, z = -3.43514; 312, z = -3.43514; 371, z = -3.43514). In all instances the handling choice in relation to the univariate outliers was to keep the cases. At this preliminary research stage these cases were considered interesting cases that may be suitable for further investigation. Additionally, nine multivariate outliers were identified p <.001 (Participants 362, p = .00004; 444, p = 0.00008; 174, p = 0.00010; 271, p = 0.00032; 170, p = 0.00037; 505, p = 0.00038; 490, p = 0.00043; 147, p = 0.00078; 500, p = 0.00082). All identified multivariate outliers were handled through deletion.

Mechanical Trade Self-Efficacy

Prior to proceeding with the remainder of the analysis, the measurement properties of the new mechanical trade self-efficacy measure were tested. Descriptive statistics and item

correlations are shown in Table 11. The correlations across all items were significant. While Items 1 and 2 had a high correlation, no changes were made to the scale.

CFA fit statistics for both the single and correlated factors models are shown in Table 12. The chi-square test was significant for both models therefore consideration was taken regarding relative fit. A chi-square test of the different models indicated the correlated factors model was significantly different $\chi^2 = 61.3$ (1) $p < .05$. The correlated factors model had relative superior fit and was therefore retained. Figure 12 represented the two factor CFA model of the mechanical trade self-efficacy scale indicating standardised path coefficients for the corresponding items and variance explained.

Table 11

Descriptive Statistics and Subscale Correlations for Mechanical Trade Self-Efficacy Scale

Scale Items	1	2	3	4	5	6	7
1. I can inspect and test mechanical parts of vehicles, equipment or structures.							
2. I can diagnose faults with mechanical components of vehicles or equipment.	.78*						
3. I can service, maintain or repair mechanical components of vehicles or equipment.	.63*	.73*					
4. I can use tools, instruments and equipment to perform mechanical tasks.	.43*	.41*	.51*				
5. I can operate vehicles and machinery as required for my mechanical trade role.	.36*	.33*	.35*	.41*			
6. I can use electronic and/or technology systems as required for my mechanical trade role, including to perform mechanical diagnosis, repair and adjustment.	.37*	.37*	.38*	.31*	.31*		
7. I can read and understand technical information.	.43*	.43*	.48*	.50*	.33*	.44*	
M	4.39	4.34	4.49	4.79	4.57	4.23	4.43
SD	0.70	0.73	0.65	0.42	0.64	0.88	0.65
Skew (SE 0.14)	-0.77	-0.89	-1.04	-1.73	-1.30	-1.19	-0.73
Kurtosis (SE 0.28)	-0.37	0.62	0.60	1.77	0.85	1.39	-0.52

* Correlation is significant at the 0.01 level.

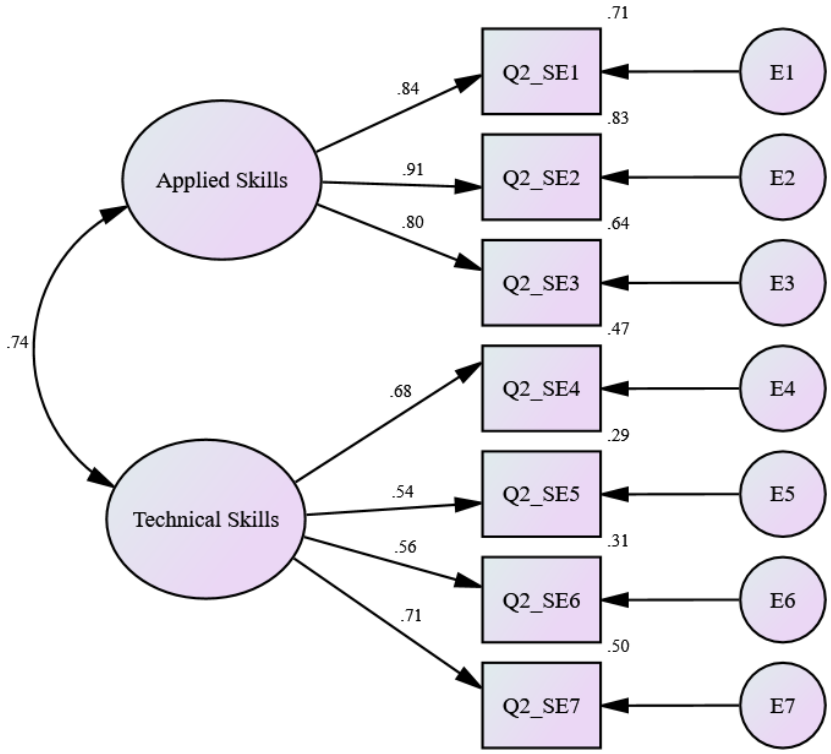
Table 12

Reported CFA Fit Statistics for Mechanical Trade Self-Efficacy Subscale

Models	χ^2	*df*	χ^2/df	*p*	RMSEA	CI (90%)	CFI	TLI
Single Factor	104.1	14	0.29	<.001	.15	.12 to .17	.90	.85
Two Correlated Factors	42.8	13	3.29	<.001	.09	.60 to .12	.97	.95

Figure 12

Two Factor CFA Model of the Mechanical Trade Self Efficacy Scale Indicating Standardised Path Coefficients for the Corresponding Items and Variance Explained



Note. The notation in the diagram Q2_SE1 etc indicate the label names in the AMOS analysis. The final number indicates the item number, as shown in Table 11.

Descriptive Statistics and Measure Correlations

Subscale correlations, descriptive statistics, and internal consistency coefficient Cronbach coefficients are shown in Table 13. An examination of the correlations in Table 13 revealed that expected variable relationships, with variable correlations in the expected directions apart from the Compensation outcome expectation variable. Compensation demonstrated a negative correlation with Work Effort, Job Satisfaction, Occupational Satisfaction, Organisational Support, and Coworker Support; and a positive correlation with Job Withdrawal Intentions and Occupational Withdrawal Intentions, which was unexpected.

The significant correlation coefficients shown in Table 13 reveal the relations among the variable subscales and the criterion variables. Job Satisfaction, Occupational Satisfaction, Job Withdrawal Intentions, and Occupational Withdrawal Intentions were not highly correlated with each other, therefore further analyses proceeded with the variables as theoretically indicated.

Table 13

Subscale Correlations, Descriptive Statistics, and Internal Consistency Coefficient Cronbach α in Parentheses

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Vicarious Learning	(.87)																	
2. Verbal Persuasion	.51*	(.86)																
3. Applied Skills	.19*	.12*	(.88)															
4. Technical Skills	.12*	.09	.60*	(.68)														
5. Ability	.15*	.17*	-.02	.08	(.66)													
6. Achievement	.14*	.12*	.09	.16*	.49*	(.69)												
7. Variety	.07	.10	.00	.11	.41*	.34*	(.80)											
8. Compensation	.03	-.08	.02	.12*	.28*	.14*	.27*	(.75)										
9. Security	-.04	-.03	.02	.12*	.25*	.27*	.30*	.45*	(.76)									
10. Advancement	-.21	.00	.03	.21*	.36*	.37*	.52*	.45*	.50*	(.82)								
11. Work Effort	.16*	.15*	.26*	.26*	.21*	.40*	.20*	.06	.12*	.19*	(.87)							
12. Job Satisfaction	.13*	.27*	.12*	.08	.16*	.18*	.05	-.22*	-.06	.02	.36*	(.86)						
13. Job Withdrawal	-.16*	-.21*	-.12*	-.03	-.08	-.11*	.02	.26*	.05	.08	-.19*	-.70*	(.91)					
14. Occupational Satisfaction	.19*	.33*	.06	.01	.17*	.16*	.07	-.21*	-.10	-.05	.22*	.58*	-.48*	(.84)				
15. Occupational Withdrawal	-.22*	-.27*	-.17*	-.07	-.13*	-.15*	-.02	.22*	.01	.03	-.19*	-.61*	.70*	-.70*	(.91)			
16. Organisational Support	.16*	.24*	.07	.05	.14*	.12*	.07	-.15*	.03	.06	.21*	.59*	-.59*	.34*	-.46*	(.92)		
17. Supervisor Support	.07	.19*	.07	.06	.07	.09	.10	-.21*	.02	-.01	.14*	.52*	-.56*	.33*	-.38*	.79*	(.95)	
18. Coworker Support	.14*	.23*	.09	.13*	.13*	.13*	.11	-.04	.14*	.16*	.12*	.46*	-.36*	.33*	-.37*	.61*	.53*	(.76)
N	300	300	302	302	302	302	302	302	302	302	301	300	300	300	297	300	302	300
Missing	2	2	0	0	0	0	0	0	0	0	1	2	2	2	5	2	0	2
M	5.15	4.38	4.41	4.51	4.21	4.56	4.02	3.98	4.39	4.19	6.62	5.22	2.45	5.00	2.24	4.65	4.76	4.80
SD	0.81	1.09	0.62	0.48	0.60	0.50	0.72	0.80	0.54	0.69	0.46	1.22	1.21	1.44	1.18	1.62	1.67	1.46
Skewness (SE 0.14)	-1.28	-0.58	-0.89	-0.79	-0.76	-1.10	-0.83	-0.66	-0.63	-0.92	-1.57	-0.79	0.34	-0.77	0.61	-0.42	-0.49	-0.56
Kurtosis (SE 0.28)	1.90	-0.36	0.54	-0.07	0.97	0.71	1.15	0.07	0.04	1.27	2.27	0.63	-0.98	0.16	-0.65	-0.56	-0.60	0.03

Note. * Correlation is significant at the 0.05 level

Confirmatory Factor Analyses

Confirmatory factor analyses were conducted on variable measures using IBM SPSS Amos Maximum Likelihood Estimation method for those study subscales with sufficient parameters to run the analyses (i.e., those measures with greater than three items). The Outcome Expectation measures, Occupational Satisfaction, Job Withdrawal Intentions, and Occupational Withdrawal Intentions measures contained only three items and were therefore unable to be included in the CFA analyses. A limitation of the IMB SPSS Amos program was its inability to conduct CFA's with these measures. The chi-square tests were significant for all measures analysed, however the RMSEA confidence values indicated acceptable fit for the Verbal Persuasion, Work Effort, and Organisational Support measures.

Table 14 reports the CFA fit statistics where measure analysis was undertaken. The CFI values indicate acceptable fit across the measures, however TLI values were less consistent. The values were varied across the measures, indicating acceptable fit for the Verbal Persuasion, Work Effort, Occupational Satisfaction and Supervisor Support measures; adequate fit for the Vicarious Learning and Job Satisfaction measures; and poor fit in relation to the Coworker Support measure. The analyses proceeded with consideration for relative fit in relation to the retained measurement models in Table 14.

Table 14

Reported Confirmatory Factor Analysis Fit Statistics for Subscales with Sufficient Parameters

Subscale	χ^2	*df*	χ^2/df	*p*	RMSEA	CI (90%)	CFI	TLI
Vicarious Learning	49.95	5	9.99	<.001	.17	.13 to .22	.94	.81
Verbal Persuasion	19.77	5	3.95	<.001	.10	.05 to .15	.98	.93
Work Effort	98.83	35	2.82	<.001	.08	.06 to .10	.94	.92
Job Satisfaction	44.38	5	8.88	<.001	.16	.12 to .21	.95	.89
Organisational Support	15.27	2	7.62	<.001	.15	.08 to .22	.92	.98
Supervisor Support	56.16	5	11.23	<.001	.18	.14 to .23	.97	.90
Coworker Support	98.60	2	49.30	<.001	.40	.33 to .47	.91	.72

Note. *p* = probability level associated with the χ^2 statistic

Regression Analyses

A series of hierarchical multiple regressions were performed to predict the criteria variables of job satisfaction, occupational satisfaction, job withdrawal intentions, and occupational withdrawal intentions. The following predictors were added in steps: perceived organisational support, realistic learning experiences, mechanical trade self-efficacy, outcome expectations, and work effort. Only those variables with significant correlations with the target variables were included in the regression analyses (see Table 13).

Job Satisfaction. Table 15 presents the findings of a six-step hierarchical multiple regression analysis conducted with progressive introduction of groups of social cognitive variables and job satisfaction as the dependent variable. Income was entered at Step 1 to control for influences external to the SCCT model [$R = 0.13$, $R^2 = 0.02$, $F(1,282) = 5.13$, $p = .02$]. Coefficients in Table 15 reveal that income was a consistent predictor at all stages, significantly contributing 1.8% variance to the model.

The Perceived Organisational Support variables (Organisational Support, Supervisor Support, and Coworker Support) were entered at Step 2 [$R = 0.62$, $R^2 = 0.39$, $F(4,279) = 43.96$, $p = <.001$]. Perceived Organisational Support significantly contributed an additional 36.9% variance to the model. While Occupational Support and Coworker Support consistently made a significant contribution to the model, Supervisor Support variable failed to contribute at all steps.

The realistic learning experience variables (Vicarious Learning and Verbal Persuasion) were entered at Step 3 [$R = 0.63$, $R^2 = 0.40$, $F(6,277) = 30.97$, $p = <.001$]. Realistic learning experiences as a source of mechanical trade self-efficacy, significantly contributed an additional 1.5% variance to the model. While the Vicarious Learning variable failed to contribute at all steps, Verbal Persuasion made a significant contribution prior to Work Effort being entered in the model. The mechanical trade self-efficacy variable (Applied

Skills) was then entered at step 4 [$R = 0.64$, $R^2 = 0.41$, $F(7,276) = 26.80$, $p = <.001$] and failed to contribute significantly at any step of the model.

The outcome expectation variables (Ability, Achievement, and Compensation) were entered at Step 5 ([$R = 0.67$, $R^2 = 0.45$, $F(10,273) = 22.16$, $p = <.001$]. At Step 5, the outcome expectation variables significantly contributed an additional 4.3% of the variance in predicting job satisfaction. While Compensation remained significant throughout the regression analysis, Ability and Achievement did not. Ability did not significantly add to the regression model at any stage. While initially significant, Achievement did not remain a significant predictor once Work Effort was added to the model. Work Effort was entered at Step 6 [$R = 0.70$, $R^2 = 0.50$, $F(11,272) = 24.22$, $p = <.001$], significantly contributing an additional 4.7% of the variance in the model.

In summary, the regression analysis accounted for 49.5% of the variance in job satisfaction. The main predictors were Perceived Organisational Support (Organisational Support and Coworker Support), outcome expectations (Compensation), and Work Effort.

Table 15

Multiple Regression Coefficients for Predicting Job Satisfaction

	Regression Steps	*B*	*SE*	β	*t*	*p*	95% CI (*B*)	
							Lower	Upper
1	**Income**	**.12**	**.05**	**.13**	**2.27**	**.02**	**.02**	**.22**
2	**Income**	**.12**	**.04**	**.14**	**2.91**	**<.01**	**.04**	**.20**
	Organisational Support	**.32**	**.06**	**.42**	**5.24**	**<.001**	**.20**	**.44**
	Supervisor Support	.08	.06	.11	1.42	.16	-.03	.19
	Coworker Support	**.12**	**.05**	**.14**	**2.29**	**.02**	**.02**	**.21**
3	**Income**	**.12**	**.04**	**.13**	**2.85**	**<.001**	**.04**	**.20**
	Organisational Support	**.31**	**.06**	**.40**	**4.94**	**<.001**	**.18**	**.43**
	Supervisor Support	.08	.06	.11	1.46	.15	-.03	.19
	Coworker Support	**.10**	**.05**	**.12**	**2.06**	**.04**	**.00**	**.20**
	Vicarious Learning	-.03	.09	-.02	-0.30	.77	-.20	.14
	Verbal Persuasion	**.15**	**.06**	**.13**	**2.42**	**.02**	**.03**	**.27**
4	**Income**	**.11**	**.04**	**.12**	**2.57**	**.01**	**.03**	**.19**
	Organisational Support	**.31**	**.06**	**.40**	**4.94**	**<.001**	**.18**	**.43**
	Supervisor Support	.08	.06	.11	1.42	.16	-.03	.19
	Coworker Support	**.10**	**.05**	**.12**	**2.02**	**.05**	**.00**	**.20**
	Vicarious Learning	-.04	.09	-.02	-0.42	.67	-.21	.13
	Verbal Persuasion	**.15**	**.06**	**.13**	**2.41**	**.02**	**.03**	**.27**
	Applied Skills	.12	.10	.06	1.21	.23	-.07	.31
5	**Income**	**.14**	**.04**	**.15**	**3.29**	**<.01**	**.06**	**.22**
	Organisational Support	**.28**	**.06**	**.37**	**4.67**	**<.001**	**.16**	**.40**
	Supervisor Support	.06	.06	.08	1.09	.28	-.05	.17
	Coworker Support	**.11**	**.05**	**.13**	**2.19**	**.03**	**.01**	**.20**
	Vicarious Learning	-.03	.09	-.02	-0.35	.73	-.20	.14
	Verbal Persuasion	.12	.06	.10	1.90	.06	-.00	.24
	Applied Skills	.12	.09	.06	1.29	.20	-.06	.31
	Ability	.13	.11	.07	1.17	.24	-.09	.36
	Achievement	**.30**	**.13**	**.12**	**2.22**	**.03**	**.03**	**.56**
	Compensation	**-.28**	**.07**	**-.19**	**-3.79**	**<.001**	**-.43**	**-.14**
6	**Income**	**.13**	**.04**	**.15**	**3.32**	**<.01**	**.05**	**.21**
	Organisational Support	**.24**	**.06**	**.32**	**4.19**	**<.001**	**.13**	**.36**
	Supervisor Support	.08	.05	.11	1.48	.14	-.03	.18
	Coworker Support	**.09**	**.05**	**.11**	**1.98**	**.05**	**.00**	**.18**
	Vicarious Learning	-.05	.08	-.03	-0.59	.56	-.21	.11
	Verbal Persuasion	.11	.06	.10	1.85	.07	-.01	.22
	Applied Skills	.03	.09	.02	0.32	.75	-.15	.21
	Ability	.13	.11	.07	1.22	.22	-.08	.35
	Achievement	.09	.13	.04	0.68	.50	-.17	.35
	Compensation	**-.29**	**.07**	**-.19**	**-4.12**	**<.001**	**-.43**	**-.15**
	Work Effort	**.66**	**.13**	**.25**	**5.02**	**<.001**	**.40**	**.92**

Note. Bold font represents significant contribution to the regression.

Occupational Satisfaction. Table 16 presents the findings of a five-step hierarchical multiple regression analysis conducted with progressive introduction of groups of social cognitive variables and occupational satisfaction as the dependent variable. Income was entered at Step 1 to control for influences external to the SCCT model [$R = 0.14$, $R^2 = 0.02$, $F(1,281) = 5.57$, $p = .02$]. Coefficients in Table 16 reveal that Income was consistent predictor at all stages, significantly contributing 1.9% variance to the model.

The Perceived Organisational Support variables (Organisational Support, Supervisor Support, and Coworker Support) were entered at Step 2 [$R = 0.40$, $R^2 = 0.16$, $F(4,278) = 13.50$, $p = <.001$], significantly contributing an additional 14.3% variance to the model. While the Coworker Support contributed significantly at all steps of the regression, both the Organisational Support and Supervisor Support variables failed to contribute at all steps.

The realistic learning experience variables (Vicarious Learning and Verbal Persuasion) were entered at Step 3 [$R = 0.48$, $R^2 = 0.23$, $F(6,276) = 13.37$, $p = <.001$]. Realistic learning experiences as a source of mechanical trade self-efficacy significantly contributed an additional 6.3% variance to the model. While the Vicarious Learning variable failed to contribute at all steps, Verbal Persuasion made a significant contribution at all steps.

The outcome expectation variables (Ability, Achievement, and Compensation) were then entered at Step 4 [$R = 0.54$, $R^2 = 0.29$, $F(9,273) = 12.27$, $p = <.001$], contributing an additional 6.3% of the variance in predicting occupational satisfaction. While Ability and Compensation remained significant throughout the regression analysis, Achievement did not significantly contribute to the regression model at any stage. The Work Effort variable was entered at Step 5 [$R = 0.55$, $R^2 = 0.30$, $F(10,272) = 11.46$, $p = <.001$], significantly contributing an additional 0.9% of the variance in the model.

In summary, the regression analysis accounted for 29.7% of the variance in occupational satisfaction. The main predictors were realistic learning experiences (Verbal Persuasion), Perceived Organisational Support (Coworker Support), and outcome expectations (Compensation).

Table 16

Multiple Regression Coefficients for Predicting Occupational Satisfaction

	Regression Steps	*B*	*SE*	β	*t*	*p*	95% CI (*B*)	
							Lower	Upper
1	Income	.15	.06	.14	2.36	.02	.02	.27
2	Income	.15	.06	.15	2.63	.01	.04	.27
	Organisational Support	.08	.09	.09	0.97	.33	-.09	.25
	Supervisor Support	.12	.08	.13	1.47	.14	-.04	.27
	Coworker Support	.21	.07	.21	3.02	<.01	.07	.35
3	Income	.14	.06	.14	2.54	.01	.03	.25
	Organisational Support	.03	.08	.04	0.39	.70	-.13	.20
	Supervisor Support	.13	.08	.15	1.68	.09	-.02	.28
	Coworker Support	.18	.07	.18	2.64	.01	.05	.31
	Vicarious Learning	.06	.11	.03	0.52	.60	-.17	.29
	Verbal Persuasion	.32	.08	.24	3.79	<.001	.15	.48
4	Income	.18	.06	.17	3.33	<.01	.08	.29
	Organisational Support	-.01	.08	-.01	-0.07	.95	-.17	.15
	Supervisor Support	.10	.07	.12	1.37	.17	-.04	.25
	Coworker Support	.19	.07	.19	2.86	.01	.06	.32
	Vicarious Learning	.07	.11	.04	0.61	.54	-.15	.29
	Verbal Persuasion	.26	.08	.20	3.23	<.01	.10	.42
	Ability	.29	.15	.12	1.93	.05	-.00	.59
	Achievement	.33	.18	.11	1.86	.06	-.02	.68
	Compensation	-.40	.10	-.22	-4.05	<.001	-.60	-.21
5	Income	.18	.06	.17	3.24	<.01	.07	.29
	Organisational Support	-.02	.08	-.03	-0.30	.77	-.18	.14
	Supervisor Support	.11	.07	.13	1.49	.14	-.04	.25
	Coworker Support	.18	.07	.18	2.75	.01	.05	.31
	Vicarious Learning	.06	.11	.03	0.51	.61	-.16	.27
	Verbal Persuasion	.26	.08	.20	3.19	<.01	.10	.42
	Ability	.30	.15	.12	1.98	.05	.00	.60
	Achievement	.22	.19	.08	1.18	.24	-.15	.58
	Compensation	-.41	.10	-.23	-4.15	<.001	-.61	-.22
	Work Effort	.33	.18	.11	1.85	.07	-.02	.69

Note. Bold font represents significant contribution to the regression.

Job Withdrawal Intentions. Table 17 presents the findings of a seven-step hierarchical multiple regression analysis conducted with progressive introduction of groups of social cognitive variables and job withdrawal intentions as the dependent variable. Income was entered at Step 1 to control for influences external to the SCCT model [$R = 0.52$, $R^2 = 0.00$, $F(1,278) = 0.75$, $p = .39$]. Coefficients in Table 17 reveal that Income was not a significant predictor at any stage and therefore, did not contribute any variance to the model.

The Perceived Organisational Support variables (Organisational Support, Supervisor Support, and Coworker Support) were entered at Step 2 [$R = 0.61$, $R^2 = 0.38$, $F(4,275) = 41.24$, $p = <.001$], significantly contributing an additional 37.2% variance to the model. While the Organisational Support and Supervisor Support significantly at all steps of the regression, Coworker Support did not significantly contribute to the model until the Satisfaction variables were entered at Step 7.

The realistic learning experience variables (Vicarious Learning and Verbal Persuasion) were entered at Step 3 [$R = 0.62$, $R^2 = 0.38$, $F(6,273) = 28.18$, $p = <.001$]. The Vicarious Learning and Verbal Persuasion variables did not significantly contribute to the model at any step. The mechanical trade self-efficacy variable (Applied Skills) was then entered at Step 4 [$R = 0.62$, $R^2 = 0.39$, $F(7,272) = 24.46$, $p = <.001$]. The Applied Skills variable did not significantly contribute to the model either. Neither the realistic learning experience nor mechanical trade self-efficacy variables contributed additional variance to the model.

The outcome expectation variables (Achievement and Compensation) were entered at Step 5 [$R = 0.65$, $R^2 = 0.42$, $F(9,270) = 22.81$, $p = <.001$], significantly contributing an additional 3.5% of the variance to the model. Compensation significantly contributed to the model at all steps, until the satisfaction variables entered the model. Achievement did not significantly contribute to the model at any step. Work Effort was entered at Step 6 [$R = 0.65$,

R^2 = 0.43, F(10,269) = 19.96, p = <.001], and did not contribute any significant variance to the model. The satisfaction variables (job and occupational Satisfaction) were entered at Step 7 [R = 0.76, R^2 = 0.58, F(12,267) = 31.10, p = <.001], contributing an additional 15.7% of the variance in the model.

In summary, the regression analysis accounted for 56.4% of the variance in the job withdrawal intentions model. The main predictors were Perceived Organisational Support (Organisational Support, Supervisor Support, and Coworker Support) and satisfaction (Job Satisfaction and Occupational Satisfaction).

Table 17

Multiple Regression Coefficients for Predicting Job Withdrawal Intentions

	Regression Steps	*B*	*SE*	β	*t*	*p*	95% CI (*B*)	
							Lower	Upper
1	Income	-.05	.05	-.05	-0.87	.39	-.15	.06
2	Income	-.04	.04	-.05	-1.00	.32	-.13	.04
	Organisational Support	**-.32**	**.06**	**-.43**	**-5.14**	**<.001**	**-.44**	**-.20**
	Supervisor Support	**-.18**	**.06**	**-.25**	**-3.18**	**<.01**	**-.29**	**-.07**
	Coworker Support	.04	.05	.05	0.77	.44	-.06	.14
3	Income	-.04	.04	-.04	-0.93	.35	-.12	.04
	Organisational Support	**-.30**	**.06**	**-.40**	**-4.82**	**<.001**	**-.43**	**-.18**
	Supervisor Support	**-.19**	**.06**	**-.26**	**-3.31**	**<.01**	**-.30**	**-.08**
	Coworker Support	.05	.05	.06	0.91	.36	-.05	.15
	Vicarious Learning	-.10	.09	-.06	-1.10	.27	-.27	.08
	Verbal Persuasion	-.05	.06	-.04	-0.73	.46	-.17	.08
4	Income	-.03	.04	-.03	-0.67	.50	-.11	.06
	Organisational Support	**-.30**	**.06**	**-.40**	**-4.82**	**<.001**	**-.42**	**-.18**
	Supervisor Support	**-.19**	**.06**	**-.25**	**-3.28**	**<.01**	**-.30**	**-.07**
	Coworker Support	.05	.05	.06	0.95	.34	-.05	.15
	Vicarious Learning	-.08	.09	-.05	-0.94	.35	-.26	.09
	Verbal Persuasion	-.05	.06	-.04	-0.73	.47	-.17	.08
	Applied Skills	-.13	.10	-.07	-1.32	.19	-.32	.06
5	Income	-.04	.04	-.05	-1.03	.31	-.13	-.04
	Organisational Support	**-.29**	**.06**	**-.38**	**-4.69**	**<.001**	**-.41**	**-.17**
	Supervisor Support	**-.16**	**.06**	**-.22**	**-2.88**	**<.01**	**-.27**	**-.05**
	Coworker Support	.04	.05	.05	0.77	.44	-.06	.14
	Vicarious Learning	-.11	.09	-.07	-1.29	.20	-.28	.06
	Verbal Persuasion	-.02	.06	-.02	-0.32	.75	-.14	.10
	Applied Skills	-.13	.10	-.07	-1.41	.16	-.32	.05
	Achievement	-.19	.12	-.08	-1.57	.12	-.42	.05
	Compensation	**.29**	**.07**	**.19**	**3.91**	**<.001**	**.14**	**.43**
6	Income	-.04	.04	-.05	-1.00	.32	-.13	.04
	Organisational Support	**-.27**	**.06**	**-.37**	**-4.47**	**<.001**	**-.40**	**-.15**
	Supervisor Support	**-.17**	**.06**	**-.23**	**-2.99**	**<.01**	**-.28**	**-.06**
	Coworker Support	.04	.05	.05	0.86	.39	-.06	.14
	Vicarious Learning	-.11	.09	-.07	-1.23	.22	-.28	.06
	Verbal Persuasion	-.02	.06	-.02	-0.27	.79	-.14	.10
	Applied Skills	-.10	.10	-.05	-1.07	.29	-.30	.09
	Achievement	-.12	.13	-.05	-0.96	.34	-.37	.13
	Compensation	**.29**	**.07**	**.19**	**3.97**	**<.001**	**.15**	**.43**
	Work Effort	-.21	.14	-.08	-1.53	.13	-.49	.06

	Regression Steps	*B*	*SE*	β	*t*	*p*	95% CI (*B*)	
							Lower	Upper
7	Income	.04	.04	.04	1.00	.32	-.04	.11
	Organisational Support	**-.16**	**.06**	**-.21**	**-2.91**	**<.01**	**-.27**	**-.05**
	Supervisor Support	**-.12**	**.05**	**-.16**	**-2.48**	**.01**	**-.21**	**-.03**
	Coworker Support	**.10**	**.04**	**.12**	**2.41**	**.02**	**.02**	**.19**
	Vicarious Learning	-.12	.07	-.07	-1.55	.12	-.26	.03
	Verbal Persuasion	.07	.05	.06	1.26	.21	-.04	.17
	Applied Skills	-.11	.08	-.06	-1.31	.19	-.27	.06
	Achievement	-.00	.11	.00	-0.01	.99	-.21	.21
	Compensation	.12	.07	.08	1.92	.06	-.00	.25
	Work Effort	.13	.12	.05	1.07	.29	-.11	.38
	Job Satisfaction	**-.47**	**.06**	**-.47**	**-7.75**	**<.001**	**-.59**	**-.35**
	Occupational Satisfaction	**-.11**	**.04**	**-.13**	**-2.52**	**.01**	**-.19**	**-.02**

Note. Bold font represents significant contributions to the regression.

Occupational Withdrawal Intentions. Table 18 presents the findings of a seven-step hierarchical multiple regression analysis conducted with progressive introduction of groups of social cognitive variables and occupational withdrawal intentions as the dependent variable. Income was entered at Step 1 to control for influences external to the SCCT model [$R = 0.08$, $R^2 = 0.01$, $F(1,278) = 1.91$, $p = .17$]. Coefficients in Table 18 reveal that Income was not a significant predictor at any stage, nor did income contribute any variance to the model.

The Perceived Organisational Support variables (Organisational Support, Supervisor Support, and Coworker Support) were entered at Step 2 [$R = 0.49$, $R^2 = 0.24$, $F(4,275) = 21.96$, $p = <.001$], contributing an additional 22.9% variance to the model. Organisational Support contributed significantly at all steps of the regression, while Supervisor Support failed to contribute at all steps. There were inconsistent findings in relation to the Coworker Support variable. While initially significant and again at the final step when the satisfaction variables were entered into the model, the Coworker Support did not produce significant effects upon entry of the realistic learning experiences, mechanical trade self-efficacy, outcome expectations and Work Effort variables into the model.

The realistic learning experience variables (Vicarious Learning and Verbal Persuasion) were entered at Step 3 [$R = 0.52$, $R^2 = 0.27$, $F(6,273) = 16.67$, $p = <.001$], significantly contributed an additional 3.2% variance to the model. Verbal Persuasion failed to contribute at all steps of the model. Vicarious Learning did not significantly contribute to the model until the Job Satisfaction variable was added at Step 7.

The mechanical trade self-efficacy variable (Applied Skills) was entered at Step 4 [$R = 0.53$, $R^2 = 0.28$, $F(7,272) = 14.95$, $p = <.001$], contributing 1.0% variance to the model. There were inconsistent findings in relation to the effect of the Applied Skills variable within the model. While significant upon entry and again when the satisfaction variables were

entered into the model, the Applied Skills variable did not produce a significant effect in the model when Work Effort was added at Step 6.

The outcome expectation variables (Ability, Achievement, and Compensation) were entered at Step 5 [$R = 0.57$, $R^2 = 0.33$, $F(10,269) = 12.81$, $p = <.001$], contributing an additional 4.5% of the variance in predicting occupational withdrawal intentions. The Compensation variable provided a significant contribution to the model until the satisfaction variables were entered at Step 7. The Ability and Achievement variables failed to contribute to the model at any step. Work Effort was entered at Step 6 [$R = 0.57$, $R^2 = 0.33$, $F(11,268) = 11.71$, $p = <.001$]. This variable did not contribute to significant variance in the model at any step. The satisfaction variables (job and occupational satisfaction) were entered at Step 7 [$R = 0.78$, $R^2 = 0.60$, $F(13,266) = 31.25$, $p = <.001$], contributing to an additional 28.0% of the variance in the model.

In summary, the regression analysis accounted for 58.5% of the variance in the occupational withdrawal intentions model. The main predictors were Perceived Organisational Support (Organisational Support), realistic learning experiences (Vicarious Learning), mechanical trade self-efficacy (Applied Skills), and satisfaction (job satisfaction and occupational satisfaction).

Table 18

Multiple Regression Coefficients for Predicting Occupational Withdrawal Intentions

	Regression Steps	*B*	*SE*	β	*t*	*p*	95% CI (*B*)	
							Lower	Upper
1	Income	-.07	.05	-.08	-1.38	.17	-.17	.03
2	Income	-.08	.05	-.09	-1.72	.09	-.17	.01
	Organisational Support	**-.27**	**.07**	**-.37**	**-4.04**	**<.001**	**-.40**	**-.14**
	Supervisor Support	-.01	.06	-.01	-0.10	.92	-.13	.11
	Coworker Support	**-.12**	**.06**	**-.14**	**-2.09**	**.04**	**-.22**	**-.01**
3	Income	-.07	.05	-.08	-1.63	.11	-.16	.02
	Organisational Support	**-.24**	**.07**	**-.32**	**-3.55**	**<.001**	**-.37**	**-.11**
	Supervisor Support	-.02	.06	-.03	-0.34	.74	-.14	.10
	Coworker Support	-.10	.05	-.12	-1.83	.07	-.21	.01
	Vicarious Learning	-.18	.09	-.12	-1.90	.06	-.36	.01
	Verbal Persuasion	-.11	.07	-.10	-1.60	.11	-.24	.03
4	Income	-.06	.05	-.07	-1.23	.22	-.15	.03
	Organisational Support	**-.23**	**.07**	**-.32**	**-3.53**	**<.001**	**-.36**	**-.10**
	Supervisor Support	-.02	.06	-.02	-0.28	.78	-.13	.10
	Coworker Support	-.10	.05	-.12	-1.82	.07	-.21	.01
	Vicarious Learning	-.15	.09	-.10	-1.66	.10	-.34	.03
	Verbal Persuasion	-.10	.07	-.10	-1.60	.11	-.24	.02
	Applied Skills	-.20	.10	-.10	-1.92	.06	-.40	.01
5	Income	-.08	.05	-.10	-1.85	.07	-.17	.01
	Organisational Support	**-.21**	**.07**	**-.29**	**-3.27**	**<.01**	**-.34**	**-.08**
	Supervisor Support	.00	.06	.01	0.06	.95	-.11	.12
	Coworker Support	-.10	.05	-.13	-1.92	.06	-.21	.00
	Vicarious Learning	-.17	.09	-.11	-1.83	.07	-.35	.01
	Verbal Persuasion	-.07	.07	-.07	-1.07	.29	-.20	.06
	Applied Skills	**-.20**	**.10**	**-.10**	**-1.98**	**.05**	**-.40**	**.00**
	Ability	-.14	.12	-.07	-1.19	.24	-.38	.10
	Achievement	-.25	.14	-.11	-1.78	.08	-.53	.03
	Compensation	**.29**	**.08**	**.20**	**3.60**	**<.001**	**.13**	**.44**
6	Income	-.08	.05	-.10	-1.83	.07	-.17	.01
	Organisational Support	**-.20**	**.07**	**-.28**	**-3.13**	**<.01**	**-.33**	**-.08**
	Supervisor Support	.00	.06	.00	-0.01	1.00	-.12	.12
	Coworker Support	-.10	.05	-.12	-1.85	.07	-.20	.01
	Vicarious Learning	-.16	.09	-.11	-1.80	.07	-.34	.02
	Verbal Persuasion	-.07	.07	-.06	-1.04	.30	-.20	.06
	Applied Skills	-.18	.10	-.09	-1.74	.08	-.38	.02
	Ability	-.15	.12	-.07	-1.19	.24	-.38	.10
	Achievement	-.21	.15	-.09	-1.42	.16	-.50	.08
	Compensation	**.29**	**.08**	**.20**	**3.63**	**<.001**	**.13**	**.45**
	Work Effort	-.14	.15	-.05	-0.92	.36	-.42	.15

	Regression Steps	*B*	*SE*	β	*t*	*p*	95% CI (*B*)	
							Lower	Upper
7	Income	.02	.04	.03	0.61	.54	-.05	.09
	Organisational Support	**-.17**	**.05**	**-.23**	**-3.20**	**<.01**	**-.27**	**-.06**
	Supervisor Support	.06	.05	.08	1.37	.17	-.03	.15
	Coworker Support	.01	.04	.01	0.18	.86	-.07	.09
	Vicarious Learning	**-.14**	**.07**	**-.09**	**-2.02**	**.04**	**-.28**	**.00**
	Verbal Persuasion	.07	.05	.07	1.37	.17	-.03	.17
	Applied Skills	**-.20**	**.08**	**-.11**	**-2.54**	**.01**	**-.36**	**-.05**
	Ability	.01	.09	.00	0.06	.96	-.18	.19
	Achievement	-.10	.11	-.04	-0.88	.38	-.33	.13
	Compensation	.05	.06	.04	0.82	.42	-.07	.18
	Work Effort	.15	.12	.06	1.30	.20	-.08	.39
	Job Satisfaction	**-.21**	**.06**	**-.22**	**-3.75**	**<.001**	**-.33**	**-.10**
	Occupational Satisfaction	**-.43**	**.04**	**-.53**	**-10.45**	**<.001**	**-.51**	**-.35**

Note. Bold font represents significant contributions to the regression.

Path Analyses

A series of path analyses were undertaken in order to further test the theoretical measurement model proposed in Study Two. Table 19 presents the goodness of fit statistics for a series of path analyses investigating an integrative SCCT model of mechanical trade persistence.

Initially, an abbreviated theoretical version of the proposed model in Figure 11 was run, with consideration for the hierarchical regression results and omission of non-significant paths. The abbreviated theoretical model contained the following constructs: Perceived Organisational Support, Perceived Coworker Support, Compensation, Ability, Work Effort, Job Satisfaction, Occupational Satisfaction, Withdrawal Intentions Job, and Withdrawal Intentions Occupation. The results are summarised in Table 19, indicating less than adequate fit to the theoretical model at this stage.

In order to better understand how the SCCT was performing in this domain, a further trimmed version of the model was run, based on further empirical reasoning as to relationships within the model. The Compensation variable was omitted, due to variability of its' performance across the analyses, starting with inconsistent correlations with the other variables, as reported earlier. Both job and occupational withdrawal intentions were also removed from the model, as they did not perform as expected under path analysis. The trimmed model is represented in Figure 13, along with the parameter estimates in this instance. The trimmed model contained the following constructs: Perceived Organisational Support, Perceived Coworker Support, Ability, Work Effort, Job Satisfaction, and Occupational Satisfaction. The results of the trimmed model path analysis are summarised in Table 19, again, indicating less than adequate fit to the theoretical model.

Table 19

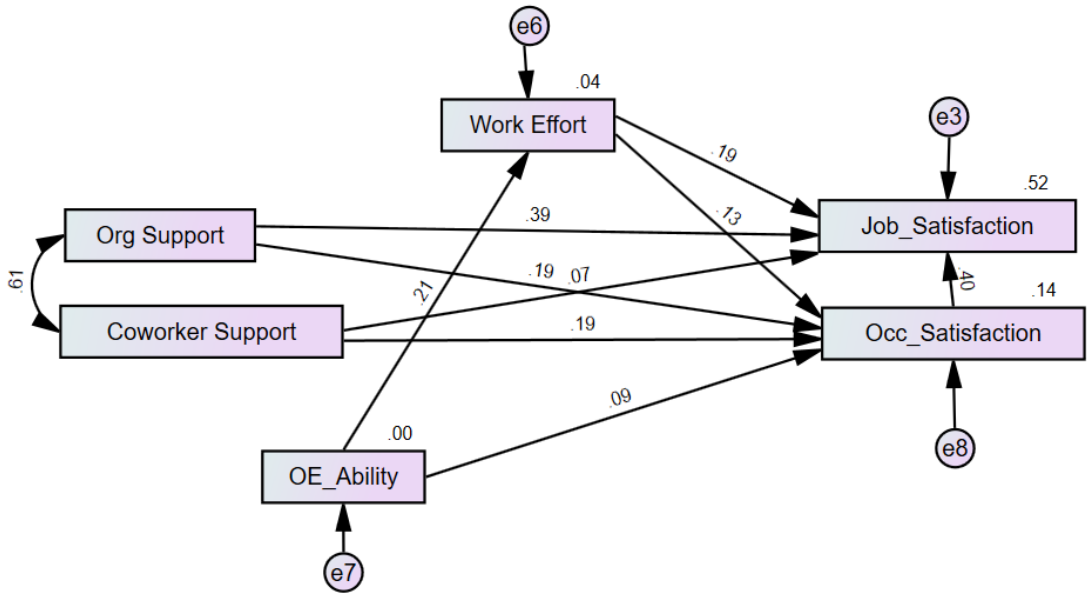
Goodness of Fit Summary Table for an Integrative SCCT Model of Mechanical Trade Persistence

Path Models	χ^2	*df*	χ^2/df	*p*	RMSEA	CI (90%)	CFI	TLI
Theoretical model	187.55	20	9.34	< .01	.16	.15 to .19	.84	.64
Trimmed model	19.56	5	0.31	< .01	.10	.06 to .15	.97	.86
Respecified model	7.37	3	2.46	.06	.07	.13 to .24	.99	.95

Note. p = probability level associated with the χ^2 statistic

Figure 13

Trimmed Integrative SCCT Model of Mechanical Trade Persistence with Path Coefficients



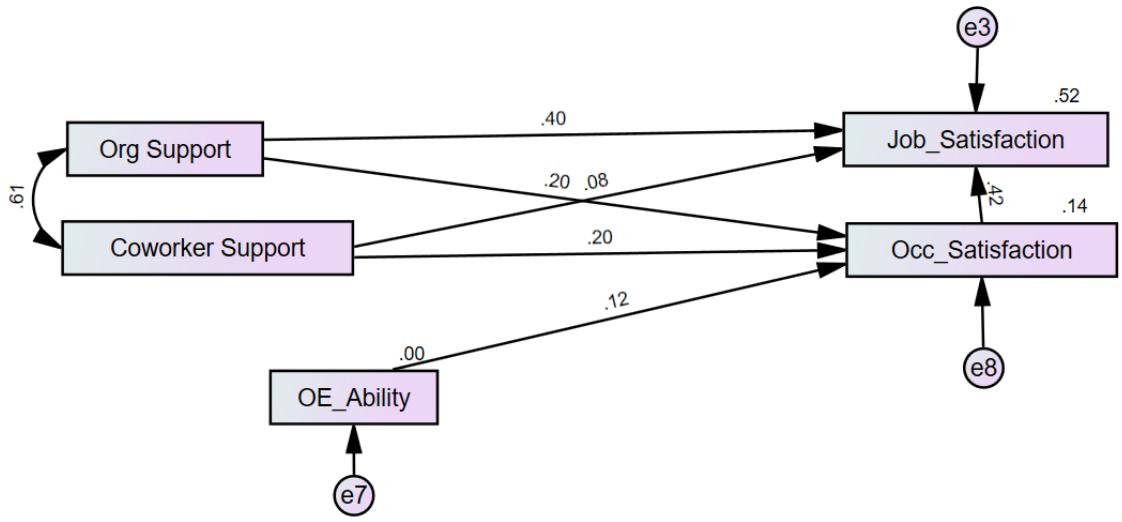
Note. Standardised regression weights are reported on paths. The variance predicted is reported above each variable. The variable names in the diagram OE_Ability etc indicate the label names in the AMOS analysis.

A final respecified model was offered, based on observations of a possible mediating role of Work Effort in the model. The respecified model, represented in Figure 14, omitted the Work Effort variable from the analysis. The respecified model contained the following constructs: Perceived Organisational Support, Perceived Coworker Support, Ability, Job Satisfaction, and Occupational Satisfaction. The parameter estimates for the respecified integrative SCCT model of mechanical trade persistence are presented in Figure 14. The results of the revised path model are summarised in Table 19, indicating good fit to the model.

While the results of this study did not fully support the original theoretical and trimmed models, the respecified model presented in Figure 14 did. The results of the path analyses support the theory that perceived organisational support and outcome expectations directly influence satisfaction in the context of mechanical trade careers, predicting 52% of the variance in this model.

Figure 14

Respecified Integrative SCCT Model of Mechanical Trade Persistence with Path Coefficients



Note. Standardised regression weights are reported on paths. The variance predicted is reported above each variable. The variable names in the diagram OE_Ability etc indicate the label names in the AMOS analysis.

Mediation Analyses

The PROCESS macro v.3.3, Model 4 (Hayes, 2018) was used to test the mediation hypothesis. The hypothesised indirect effect of Ability on Occupational Satisfaction, via Work Effort was tested in relation to relationships observed while conducting the trimmed model path analysis presented in Figure 13.

As shown in Table 20, Ability had a significant association with Work Effort (a = .16) and, in turn, Work Effort had a significant association with Occupational Satisfaction (b = .61). With 5000 bootstrapped samples, the mediation of Work Effort was evident in the indirect effect of Ability on Occupational Satisfaction (ab = .40, p = < .01). Without Work Effort, the direct effect of Ability was evidently diminished (c' = .31, p = .02) with findings consistent with its coefficient's diminution in the analysis upon entry of Work Effort.

The predictive power of Ability decreases when Work Effort is introduced into the predictive model of Occupational Satisfaction. There was a significant indirect effect of Ability on Occupational Satisfaction through Work Effort. The indirect effect was .09 (bootstrap 5000 samples confidence intervals .03 to .19). Observation of the bootstrap confidence intervals means there is likely to be a genuine indirect effect. In this instance, the relationship between Ability and Occupational Satisfaction can be explained by Work Effort.

Table 20

Mediation Model of Ability on Occupational Satisfaction via Work Effort

		M (WE)				γ (Satisfaction)		
		B	*SE*	*p*		*B*	*SE*	*p*
C	i_M	5.96	0.18	< .01	i_γ	-0.31	1.21	.80
X (Ability)	*a*	0.16	0.04	< .01	*c'*	0.31	0.14	.02
M (WE)		-	-	-	*b*	0.61	0.18	< .01
		$R = 0.21$, $R^2 = 0.04$				$R = 0.25$, $R^2 = 0.06$		
		$F(1,298) = 13.17$, $p = <.01$				$F(2,297) = 10.29$, $p = <.01$		

Note. *C* = constant; *X* = predictor, *M* = mediator, γ = outcome variable; *a* = effect of *X* on *M*, *b* = effect of *M* on γ, *c*' = direct effect of *X* on γ; satisfaction = occupational satisfaction.

Discussion

This chapter has reported on the method and results of empirical testing of an integrative SCCT model of mechanical trade persistence. A brief summary of Study Two results will be discussed, prior to integration of the findings of Study One and Two in Chapter Six: General Discussion.

The aim of Study Two was to test an integrative SCCT model of mechanical trade persistence in Australia. A sample of 312 mechanical trade STEM workers completed The Australian Survey of Mechanical Trade Careers, which used psychometric measures to operationalise the core variables as determined through domain specific research conducted in Study One. Statistical analyses conducted throughout Study Two enabled empirical testing of the research hypotheses in relation to the core variables.

In order to test hypotheses related to mechanical trade self-efficacy, a new measure was developed relative to the domain. The retained correlated factors measurement model was retained due to relative superior fit, however, CFA results in relation to the new scale were not optimal. While self-efficacy is a core construct of the SCCT, mechanical trade self-efficacy did not contribute either directly or indirectly to modelling of mechanical trade satisfaction, nor persistence in this domain. The results of Study Two did not support the hypotheses in relation to self-efficacy within the theorised model.

Outcome expectations are another core construct of the SCCT that were hypothesised to contribute both directly and indirectly to the modelling of mechanical trade satisfaction and persistence. The results of Study Two support the hypotheses that outcome expectations predict satisfaction and persistence intentions, and that outcome expectations are indirectly associated with satisfaction through goal-directed activity.

Satisfaction was hypothesised to directly influence persistence intentions. The results of Study Two support the hypothesised core role of satisfaction in the modelling of

persistence intentions within the mechanical trade domain. In addition, contextual support and sources of self-efficacy operated as theoretically expected when integrating the SCCT constructs to predict satisfaction and persistence.

The results of Study Two demonstrate that an integrative SCCT model of mechanical trade persistence can demonstrate how (a) contextual supports, (b) outcome expectations, (c) goal-directed behaviour, and (d) satisfaction inter-relate to predict persistence intentions. In response to the need to integrate the general findings in relation to mechanical trades to the agricultural industry, the results from Study One and Study Two will be integrated in Chapter Six: General Discussion.

CHAPTER SIX: GENERAL DISCUSSION

The agricultural industry is vital for global economies, food and fibre security, and meeting the United Nations' sustainability goals (McIlveen, 2015; McIlveen & McDonald, 2019). However, the industry experiences critical labour shortages, limiting the productivity that is required to meet these global needs (National Farmers' Federation and Sefton & Associates, 2013). Unfortunately, the agricultural industry has struggled to attract and retain the skilled and semi-skilled workforce it requires to meet these global production challenges (Commonwealth of Australia, 2015), limiting its productivity (National Farmers' Federation and Sefton & Associates, 2013; Nelson, 2011).

Attracting a flexible science, technology, engineering, and mathematics (STEM) skilled workforce is also considered necessary in this climate (Australian Government Office of the Chief Scientist, 2014b), where production gains should be made by building the human capital of the industry (Commonwealth of Australia, 2015; National Farmers' Federation and Sefton & Associates, 2013; Nelson, 2011). The vocational psychology of agriculture (VPA; McIlveen, 2015; McIlveen & McDonald, 2019) and psychology of working (POW; Blustein, 2006) framework guides vocational research to look to under-represented workers in order to advance our capability to positively influence the well-being of people through their world of work.

STEM workers educated via Vocational Education and Training (VET) occupations are vital to supporting the agricultural industry to meet is productivity requirements, yet they are under-represented in career development research. Attracting and retaining mechanical tradespeople within agricultural careers is considered of vital importance in this global climate. The SCCT's prominence in modern career development and vocational psychology research informed its utilisation as the guiding scientific framework of VPA research (McIlveen, 2015; McIlveen & McDonald, 2019).

Integrative SCCT modelling of persistence has been theoretically supported within the domain of engineering (Lent, Miller, et al., 2016; Lent et al., 2013; Navarro et al., 2014) and the SCCT as a whole has been well-supported across STEM domains (Brown & Lent, 2019; Lent & Brown, 2019; Sheu et al., 2010). The SCCT is relatively new to the agricultural domain and under-represented populations such as VET trained occupations. As such, the SCCT cannot yet be reliably generalised to STEM trade careers. As vocational psychology does not yet offer the theoretical or practical contributions to predicting the persistence intentions of mechanical trade VET trained careers in agriculture, the present research aimed to understand gaps in knowledge about the career motivations of mechanical trade STEM careers in agriculture, further exploring the SCCT while by providing useful evidence to support human capital within the sector.

Understanding more about mechanical trade workers' satisfaction and persistence intentions within their careers is necessary to inform the attraction and retention of mechanical trade workers in Australian agriculture. The SCCT (Lent, Miller, et al., 2016; Lent et al., 2013) offered an integrative theoretical platform that allowed for the study of vocational persistence (i.e., retention) within the STEM domain of mechanical trade careers in agriculture. The SCCT provides a comprehensive and new approach to understanding Australian mechanical trades work, to provide empirical evidence to describe the work context, while building on contextual evidence to assist with establishing these vital agricultural career paths.

Drawing on the POW (Blustein, 2006) framework, this contextualised approach to psychological research offered an exploratory perspective to study the contextual experiences of working mechanical tradespeople. The research involved sequential mixed-methods design across two studies: Study One, a qualitative study of 19 mechanical tradespeople to operationalise the SCCT to the mechanical trade domain, and Study Two, a quantitative study

of 302 mechanical trade workers to investigate an integrative SCCT model of persistence within the domain.

Main Findings

The research aimed to offer theoretical and practical contributions to predicting occupational satisfaction and persistence in agricultural careers, specifically VET trained mechanical trade occupations that support the agricultural machinery sector. The research operationalised the core constructs of the SCCT in the mechanical trade domain and deductively tested an integrative SCCT model of mechanical trade persistence. This initial research has allowed for generalised findings in relation to mechanical trade career motivations to be reliably applied to strategies to inform the attraction and retention of mechanical trade workers within the agricultural machinery sector.

The qualitative Study One supported the domain operationalisation of the SCCT to mechanical trade careers. Quintessential Australian mechanical tradespeople are stereotypically characterised as hard-working, value-oriented people with a down-to-earth character. The results of Study One fully supported this characterisation, while allowing further understanding of the work domain from the perspective of the workers themselves.

It was identified through Study One, that beyond organisational support, the role of coworker support was also important for this group. It was also clear that for most, their mechanical trade self-efficacy and realistic interests developed at an early age, for some, as early as primary school. Within this work domain, the mechanical tradespeople commonly spoke of their role as a provider, linking this role to a need for secure and stable work that they were fairly compensated for. Most were satisfied with their jobs and occupations, intending to persist.

Study Two explored the hypothesised relations of an integrative SCCT model of persistence, particularly in relation to the core cognitive variables of mechanical trade self-

efficacy and outcome expectations in predicting satisfaction and persistence. It was hypothesised that mechanical trade self-efficacy would predict satisfaction and persistence intentions, and that the relationship between self-efficacy and satisfaction would also be mediated by outcome expectations and goal-directed activity. These hypotheses were not supported.

It was also hypothesised that outcome expectations would predict satisfaction and persistence intentions, and that the relationship between outcome expectation and satisfaction would be mediated by goal-directed activity. These hypotheses were supported in this domain. Additionally, it was hypothesised that satisfaction would predict persistence intentions, a hypothesis that was also supported in this context. Satisfaction was a key predictor of persistence intentions.

Additionally, contextual supports and barriers, sources of self-efficacy, and goal-directed activity performed as expected within the theoretical model in relation to their roles in predicting satisfaction and persistence within mechanical trade careers. The key findings of the current research indicate that SCCT can be useful in terms of expanding the VPA (McIlveen, 2015; McIlveen & McDonald, 2019) into the mechanical trade domain and as such, the theoretical findings presented throughout will now be discussed in relation to generalisability to the agricultural industry.

Theoretical Implications

Persistence

Understanding factors that influence the persistence intentions of mechanical trade workers is key to retaining workers within the profession and building the human capital of the agricultural industry. The main predictors of the occupational persistence intentions of mechanical tradespeople were perceived organisational support, vicarious learning experiences, compensation values, as well as both job and occupational satisfaction.

Mechanical tradespeople who consider themselves supported by their employer, have access to learning experiences through interactions with other mechanical tradespeople, and who believe they are adequately compensated for their work are more likely to be satisfied with their job and occupation. In turn, these workers are more likely to be retained within the occupation.

While occupational retention is important overall for national skill sets, retaining mechanical tradespeople within their jobs is also key to continued development of the agricultural industry. In addition to predicting intentions to persist in the occupation, the core social cognitive variables were also examined regarding their role in predicting intentions to persist in the job. While perceived organisational support and satisfaction were important factors in relation to predicting both job and occupational persistence intentions, supervisor and coworker support were of additional predictive importance in relation to retaining workers in their current job. Mechanical tradespeople who perceive they are supported by their employer, supervisor, and coworkers are more like to be satisfied with their job and occupation, and in turn, more likely to persist in their jobs.

Satisfaction

Satisfaction is a key predictor of persistence intentions within mechanical trade careers. Satisfaction is the extent to which people have positive emotions in relation to their work domain. The social cognitive approach acknowledges that both job and occupational satisfaction have multiple sources that have been investigated throughout this study. Mechanical tradespeople describe satisfaction gained from their roles using emotive words to describe their enthusiasm for and enjoyment of their work.

The present finding is that satisfaction is a key predictor of intentions to persist, not only in the job, but the overall occupation of mechanical tradesperson. These findings are consistent with core SCCT research in relation to the utilisation of the integrative model of

choice stability within the field of engineering, where findings support the relationship between satisfaction and intended persistence (Lee et al., 2015; Navarro et al., 2014; Navarro et al., 2019).

The main predictors of the occupational satisfaction were vicarious learning experiences, perceived coworker support, and compensation values. Mechanical tradespeople who consider themselves supported by their coworkers, have access to learning experiences through interactions with other mechanical tradespeople, and who feel they are adequately compensated for their work, are more likely to be satisfied with their job and occupation.

Additional social cognitive sources were predictive of job satisfaction within the domain of mechanical trade work. The main predictors of job satisfaction were the same as for occupational satisfaction, with the addition of perceived organisational support and goal-directed activity. Therefore, beyond the sources of overall occupational satisfaction, perceived organisational support and work effort additionally assist with predicting mechanical trade job satisfaction.

Contextual Barriers and Supports

Contextual barriers and supports are the social elements of the SCCT that impact upon individual career development. These environmental affordances are theorised to directly predict both satisfaction and persistence intentions, and to relate to vocational outcomes through self-efficacy and outcome expectations (Brown & Lent, 2019; Sheu et al., 2010). While this research was unable to find evidence of the indirect relationship of contextual barriers and supports to self-efficacy and outcome expectations, the direct relationships with satisfaction and persistence intentions were supported. These findings support Brown et al. (2018) who found that despite the experience of negative contextual influences, contextual supports remain a key predictor of vocational outcomes.

Study One enabled contextualisation of reported barriers relevant to maintaining a career as a mechanical tradesperson. Mechanical tradespeople report that unrealistic customer expectations, the increasing complexity of electric and hydraulic tasks, and requirements for increasing technological skills are considered difficult aspects of their work environment. Many report that the work is physically demanding, dirty, and at times, repetitive. These factors are unique to the job demands with several workers expressing concern about their ability to persist in the occupation as their physical capacity decreases with age.

Study One also enabled contextualisation of reported supports relevant to maintaining a career as a mechanical tradesperson. Mechanical tradespeople value flexible working conditions, employers who demonstrate concern for their individual needs, and being seen for their contribution to the workplace. They additionally consider organisational support to relate closely to progression of their career goals and values.

Beyond the organisation though, mechanical tradespeople value the role of their trade supervisor and coworkers. Supervisory support was valued as enabling worker to perform tasks with a sense of achievement, advancement, and a sense of accomplishment. Coworker support was generally characterised in relation to jovial relationships with peers, a theme that was considered to differ from the practical support provided by coworkers in relation to task completion and sources of self-efficacy. Study Two successfully extended upon the SCCT literature, by operationalising contextual support as perceived coworker support, perceived supervisor support, and perceived coworker support.

Mechanical Trade Self-Efficacy

Self-efficacy is a core social cognitive construct of the SCCT and the central mechanism of personal agency that is theorised to directly predict outcome expectations, satisfaction and persistence intentions (Brown & Lent, 2019; Lent & Brown, 2006b). Self-

efficacy relates to a person's confidence in their ability to meet the requirements of their domain-specific work-related tasks (Lent & Brown, 2006b).

Study One enabled the operationalisation of self-efficacy within the mechanical trade domain, finding consistency across industry in relation to the tasks that mechanical tradespeople complete while performing their trade. Mechanical tradespeople inspect, test, diagnose faults in, operate, maintain, repair, and service a diverse range of mechanical vehicles, equipment, machines, and assemblies, using tools, equipment, instruments, and technical information. Technological, electrical, and hydraulic systems are now commonplace.

Study One enabled the operationalisation of domain-specific indicators of mechanical trade self-efficacy. In this domain, mechanical trade self-efficacy beliefs were most often formed in childhood and adolescence, combining with realistic interests to inform occupational attraction. Study One also found that within the occupation, ongoing maintenance of mechanical trade self-efficacy was related to peer learning experiences in the workplace. Within the mechanical trade domain, knowledge transfer between experienced tradespeople assists members of the trade team to develop their trade skills, personal goals, and to meet their work values. Mechanical tradespeople gain satisfaction from working with their coworkers to solve complex work demands, utilising collective skills and knowledge to progress.

While Study One findings supported the conceptualisation of VET trained workplaces as learning environments (Billett, 2004; Billett & Pavlova, 2005), they did not support omnibus findings in relation to the core role of self-efficacy in the SCCT (Brown & Lent, 2019; Lent & Brown, 2019), nor did they support previous findings related to SCCT persistence research in the engineering domain (Navarro et al., 2019). Despite the development of a new self-efficacy measure, Study Two was unable to support the predictive

role of mechanical trade self-efficacy in relation to satisfaction and persistence intentions. There appeared to be a ceiling effect in relation to in relation to this variable, with little variation in levels of mechanical trade self-efficacy noted across the sample.

Sources of Realistic Self-Efficacy

The sources of self-efficacy and learning experiences are theorised within the SCCT literature (Lent et al., 2017; Sheu et al., 2018), however this variable is not included in integrative SCCT models of persistence (Lee et al., 2015; Lent, Miller, et al., 2016; Lent et al., 2013; Navarro et al., 2014; Navarro et al., 2019). It was evident in Study One that attempts to contextualise mechanical trade self-efficacy were linked to discussion around the sources of realistic self-efficacy. Realistic self-efficacy relates to learning experiences that occur in the Realistic RIASEC (Holland, 1997) domain. This research attempted to build on the theorised relationship between the sources of realistic self-efficacy and mechanical trade self-efficacy within an integrative SCCT model of mechanical trade persistence.

Investigation of workers' experiences of personal successes and failures, positive and negative emotions, social encouragement or discouragement, and observation of others in relation to mechanical trade tasks played a key role in understanding the development and maintenance of mechanical trade self-efficacy. The role of sources of realistic self-efficacy and learning experiences in the mechanical trade domain is particularly relevant, as this domain has been conceptualised as a participatory learning environment.

Mechanical tradespeople often report strong associations between development of their mechanical trade self-efficacy during their primary and secondary schooling years, with interest in, and attraction to, the occupation. This research extended understanding of the sources of realistic self-efficacy to the mechanical trade domain. Mechanical trade workers report that personal performance experiences, observation of others performing mechanical tasks, task feedback and affective states in relation to personal competency are related to the

continued development of their mechanical trade self-efficacy. The current research supported theorised role of the sources of self-efficacy in the SCCT, finding that mechanical trade self-efficacy beliefs were acquired and modified through realistic learning experiences.

Outcome Expectations

Outcomes expectations are the beliefs that people hold about the extent to which their career satisfies their primary values (Lent & Brown, 2006b; Lent et al., 1994). While empirical literature supports the general construct validity of career-related outcome expectations, as well as the hypothesised relationships between outcome expectations and other SCCT constructs (Fouad & Guillen, 2006; Lent & Brown, 2019), research in relation to the significance of outcome expectations within the SCCT has proved inconclusive (Lee et al., 2015).

Lent et al. (2007) reported that interest and choice measures of outcome expectations did not adequately represent the most salient outcomes when investigating persistence intentions, subsequently adding the theory of work adjustment to the measurement of outcome expectations (Lent, Miller, et al., 2016; Lent et al., 2013). As a result of these measurement and outcome inconsistencies, scales from the Minnesota Importance Questionnaire were included in subsequent persistence research (Lent, Miller, et al., 2016; Lent et al., 2013). In the context of persistence research within the mechanical trade domain, a sound case was provided for operationalising outcome expectations through the Minnesota Importance Questionnaire (MIQ), both theoretically (Lent, Miller, et al., 2016; Lent et al., 2013) and conceptually, following Study One investigation of the construct within the mechanical trade domain.

Mechanical tradespeople present as value-oriented workers who find it important to gain a personal sense of accomplishment through their work while providing for their family. In addition to their personal needs, mechanical tradespeople value their contribution to

industry and communities, often reporting passion for their specialisations. The opportunity to make use of one's mechanical trade ability was the most reliable outcome expectation variable construct in relation to predicting mechanical trade satisfaction in the current research.

Mechanical tradespeople also value being able to see the results of their work, take pride in a job well done, and to gain a sense of accomplishment from solving complex problems. They gain enjoyment from experiencing a variety of work tasks and environments, and report feeling dissatisfied when their job lacks variety. Mechanical tradespeople also seek security through their work, in relation to the availability of work and the continued need for their specific skill sets, as this enables them to provide for themselves and others. Mechanical tradespeople also highlight the importance of opportunities for skill advancement within their jobs and industry. This includes the opportunity to develop a career through increased skills, competence, and ability to pass their trade information within their relational learning environment.

It is generally expected that once a mechanical tradesperson has completed their apprenticeship training, that they are able to increase their wages based on skill development, work capacity, and commitment to industry roles, particularly in remote areas of Australia. Additionally, they expect their wages across and within industry to be comparable. While comparable income is important, this research was unable to determine the predictive role that perceptions of compensation play in mechanical trade satisfaction and persistence. The compensation variable didn't perform as expected in relation to the core relationships with other variables in Study Two.

These results support the findings of several SCCT studies that report significant relationships between outcome expectations and the prediction of satisfaction in academic domains (Byars-Winston et al., 2010; Flores et al., 2014; Lent et al., 2005, 2013), as well as

accumulative SCCT findings indicating that assumptions related to outcome expectations are generally theory-consistent, despite measurement inconsistencies (Fouad & Guillen, 2006; Lent & Brown, 2019).

Personality and Affective States

Personality and affective dispositions are theorised to have a direct effect on contextual barriers and support, self-efficacy, interests, and career development processes within the SCCT (Lent et al., 2013; Navarro et al., 2019), often with focus on the personality trait of consciousness as a positively valued occupational trait (Brown et al., 2011). Conscientiousness is characterised by achievement-orientation behaviour, such as hard work, self-discipline, and motivation to achieve (Brown et al., 2011). There was ample evidence to proceed with investigation of the trait of conscientiousness within the mechanical trades context, as this personality trait has been found to be a strong and consistent predictor of workplace performance (Judge et al., 2002; Judge & Ilies, 2002).

In addition to the personality trait of conscientiousness, the VPA (McIlveen & McDonald, 2019) ascertains that other personality traits such as grit, may motivate agricultural workers. Grit is a personality trait defined as perseverance and passion for long-term goals, with demonstrated predictive validity over and beyond conscientiousness in measures of vocational success (Duckworth et al., 2007). This research sought to extend upon the both SCCT and the VPA (McIlveen, 2015; McIlveen & McDonald, 2019), by investigating both conscientiousness and grit within the context of mechanical trade careers.

The results of Study One supported the operationalisation of personality and affective states within the mechanical trade domain. The specific constructs of diligence, prudence, consistency of interest, and persistence of effort provided descriptions around person characteristics demonstrated by mechanical tradespeople in relation to their occupation. Mechanical tradespeople demonstrate commitment to their work, their lives and their

communities. Many mechanical tradespeople demonstrate persistent commitment to their work and personal lives, as well as consistency of their interest in the mechanical domain. During interviews with the participants, personality and affective traits were presented in terms of how the mechanical tradespeople discussed their work behaviour and experiences, which is consistent with the realistic nature of their work and character.

Consistent with previous findings, Study One supported the operationalisation of personality in terms of conscientiousness (Brown et al., 2011) and grit (McIlveen & McDonald, 2019). Operationalisation of personality traits in the mechanical trade context can be viewed through the conscientiousness constructs of diligence and prudence, and the grit constructs of consistency of interest and persistence of effort.

Realistic Interests

Within the SCCT, interests serve as a primary attractor to STEM careers (Lent et al., 2013), with established SCCT research (Lent & Brown, 2006b; Lent et al., 1994) examining domain specific vocational interests using Holland's (1997) RIASEC types. Mechanical trade careers involve hands-on, practical, active work with machines and tools, both indoors and outdoors — falling within the realistic RIASEC (Holland, 1997) type. Study One supported this operationalisation of interests within the mechanical trade domain, confirming the presence of consistent, specific realistic interests in this occupational group.

Realistic interest was reported in both occupational domains regarding mechanical trade work, as well as within the social domain. Mechanical tradespeople often report additional realistic interests, related to engagement in activities such as speedway, 4-wheel-driving, boating and vehicle restoration, adding further support to the presence of realistic interests within this population.

Goal-Directed Activity

Goal-directed activity is theorised within the SCCT as a person's determination to effect particular work outcomes or performance levels, while playing a key role in relation to satisfaction outcomes (Lent & Brown, 2006a). While goal-directed activity is generally investigated within the SCCT model of satisfaction (Lent & Brown, 2006a), this variable is not included in integrative SCCT models of persistence (Lee et al., 2015; Lent, Miller, et al., 2016; Lent et al., 2013; Navarro et al., 2014; Navarro et al., 2019).

The results of Study One however, supported the operationalisation of personality and affective states, and realistic interests within the mechanical trade domain as goal-directed activity. This was consistent with operationalisation of character traits and interests in behavioural terms. This research attempted to build on the theorised relationships between self-efficacy and outcome expectations with satisfaction (Lent & Brown, 2006a), by adding goal-directed activity to an integrative SCCT model of mechanical trade persistence.

Mechanical tradespeople display diligence, prudence, consistency of interest, and persistence of effort in the workplace setting. These behaviours can be conceptualised as work effort behaviour, which can be measured in terms of persistence, direction, and intensity (De Cooman et al., 2009). They do not give up quickly when something does not work, a quality that is core to meeting the problem-solving nature of their work. Mechanical tradespeople report that with the support of their coworkers, they can often spend months investigating and solving technical issues within their jobs. They do their best to get their work done, regardless of potential difficulties, as in many instances their jobs are the results of a breakdown or repair need.

Mechanical tradespeople also perform their work with a sense of respect for the need to be trustworthy in the execution of their tasks, for the overall benefit of their coworkers, supervisors, and customers. They perceive themselves as loyal hard workers, who do their

best to achieve the objectives of their organisation. Mechanical tradespeople reflect themselves as hard-working, value-oriented people who strive for many years to achieve their accomplishments in the mechanical trade domain. They understand that it is fraught with problems and difficulties, persisting none-the-less.

While the opportunity to make use of one's mechanical trade ability was the most reliable outcome expectation predictor of mechanical trade satisfaction in the current research, the predictive power of ability was found to decrease when goal-directed activity was added to the model. In the context of mechanical trade careers, the relationship between ability and occupational satisfaction was able to be explained by the operationalisation of goal-direct behaviour as work effort.

Practical Implications

During the writing of this thesis, the national context of the world of work was impacted by a health pandemic, impacting global agricultural supply chains and highlighting the vital importance of the agricultural industry in providing food and fibre to the world. My continued association with the agricultural machinery sector gave insight into the impact of this pandemic within the agricultural industry, which has experienced difficulties maintaining supply and distribution chains, both on-farm and off. In this context, mechanical trade careers in agriculture have remained essential so as to minimise disruptions to the industry. Perhaps this global pandemic and the resultant uncovering of essential workers may change perceptions about the stability, security, and vital innovative role of agricultural careers for the better.

This section draws on the findings of the current research to directly address the applicability of the theoretical implications to addressing problems with attraction and retention within mechanical trade careers in the agricultural machinery sector. Through understanding the factors that influence mechanical trade satisfaction and persistence, the

agricultural machinery sector can be better informed in relation to strategies to assist with retention of this occupation within the agricultural industry.

The primary practical implication of this research relates to efforts to retain mechanical trade workers in the agricultural machinery sector, in order to build human capital within the industry. This aim supports the industry to meet production goals, while assisting with efforts to build the attractiveness and sustainability of these careers.

Mechanical tradespeople have confidence in their ability to meet the demands of their occupation and job roles. Generally, their confidence with, and interest in, mechanical trade tasks have formed well before they commence working in the occupation. This research did not find a connection between a person's confidence in their ability to perform their work tasks and their satisfaction or persistence intentions.

Within the occupation, mechanical tradespeople experience environmental barriers that negatively affect their experience of satisfaction and their persistence intentions in relation their mechanical trade work. These barriers include managing customer expectations, lack of variety, technological issues, difficulties related to electric and hydraulic tasks, and demanding physical requirements. Despite this, the provision of organisational support is recognised as a key environmental factor that positively influences the satisfaction and persistence intentions of mechanical tradespeople. In this context, organisational support can simply be seen as to the need to engage in healthy relationships with workers, whilst making reasonable efforts to accommodate their needs.

Further to the role of organisational support, a unique finding of this research is that mechanical tradespeople feel it is important to have jovial and supportive relationships with their coworkers, both socially and in relation to their ongoing mechanical trade learning experiences. Mechanical tradespeople seek to be given tasks and roles within the occupation,

that allow them to work on a variety of tasks, that offer enough complexity to make adequate use of their ability.

Mechanical tradespeople are considered conscientious, persistent workers, which, in the workplace, can be operationalised as goal-directed behaviour. While organisational support and making use of a workers' ability are predictive of a mechanical tradespersons' satisfaction and persistence intentions, conscious, goal-directed behaviour can mediate the relationship between the importance of making use of ability and occupational satisfaction.

It is hoped that efforts to develop and retain the current mechanical trade, STEM skilled workforce, the agricultural machinery can address the need for increased industry productivity, as well as provide a more attractive organisational environment for future industry entrants. Beyond positively influencing the human capital of the current workforce, the agricultural machinery sector, may also look to practical solutions to attracting new talent to the workforce.

Poor and outdated perceptions of agricultural work as a career choice are considered a significant barrier to attraction of STEM skilled workers to the industry. The agricultural industry needs to be repositioned as a resilient, technologically advanced sector that is vital to addressing global needs for food and fibre, while supporting global economies. In order to attract a highly skilled and diverse workforce that drives STEM innovation and growth, while meeting increased production demands, the agricultural industry requires support with promotion of the skilled agricultural career pathways. Agriculture must be repositioned as using contemporary skills and providing significant career opportunities in the interest of food and fibre security.

While investigating factors relevant to the retention of mechanical tradespeople within the agricultural industry, additional findings have provided insight into the social cognitive factors that influence attraction to this career. Attracting additional talent to mechanical trade

roles in the agricultural industry can take many practical paths, including seeking to entice mechanical tradespeople to move across from other industries, attracting school-leavers, and attracting mature-age workers to this career.

The results of the research support the early formation of mechanical trade self-efficacy throughout childhood and adolescence. Mechanical trade self-efficacy is developed through observation of others performing mechanical tasks, personal experience with mechanical tasks and associated social feedback, as well as feelings about the tasks and expressing realistic interests. Mechanical tradespeople are often engaged with mechanical activities, prior to, or during their career entry, with involvement with social activities like motor sports, vehicle restoration, 4-wheel-driving, and farming.

Beyond engaging with educational systems and employment networks, the agricultural sector may seek to locate suitable career entrants, either early or mature age, through increased contact with other realistic activities that these people may be engaged in. This would enable promotion of these vital skilled career paths to people who already demonstrate interest within the mechanical trade domain, and have experienced opportunity to develop mechanical trade-self efficacy.

In relation to attracting school-leavers, the attractiveness of mechanical trade careers in the agricultural sector must be raised by people outside of the family environment, who also influence career beliefs. Many of the mechanical tradespeople who were interviewed, expressed limited support for the career path through their educational experiences. School and career guidance counsellors, trade teachers, and educators may benefit from education around the significant opportunities that mechanical trade careers in agriculture can offer.

According to the most recent meta-analysis of the effectiveness of career choice interventions (Whiston et al., 2017), several recommendations should be considered to assist with attracting and retaining mechanical tradespeople within the agriculture industry.

Effective career education and counselling should include the critical ingredients of counsellor support, values clarification, and psychoeducation (Whiston et al., 2017). Specific suggestions that support the goal of attracting young people to agricultural careers include teacher education, career practitioner education, and engagement with apprenticeship placement agencies. This process of engagement should highlight the essential nature of mechanical trade work in agriculture, as well as the valued outcomes and satisfaction reported by workers engaging in these careers, therefore assisting with the career development process of attracting suitable young people to these vital agricultural careers.

In addition to attracting suitable early career workers to the sector, the attractiveness of mechanical trade careers should be promoted by career development and employment support services. Not all mechanical tradespeople enter the profession directly from high school. Mature-aged workers report a range of circumstances that impact upon the timing of their entry to the careers. Support from employment agencies and career development services to assist with identifying suitable mature-age workers to enter the profession would provide an alternative source of talent for the industry as well.

Methodological Implications

This investigation of the career motivations of mechanical tradespeople utilising an integrative SCCT model of mechanical trade persistence is argued to be well-positioned methodologically. The VPA (McIlveen, 2015; McIlveen & McDonald, 2019) and POW (Blustein, 2006) framework have supported the domain operationalisation of the SCCT to under-represented VET trained workers within the agricultural industry. Two key methodological implications of the current research will be presented.

The findings of Study One informed the development and testing of a new measure of mechanical trade self-efficacy. Despite being conceptually and empirically sound, and well-conceived psychometrically, the CFA results in relation to this new scale were not optimal.

The measurement properties of the mechanical trade self-efficacy scale were not sufficient enough to test and reject the theoretical model in this occupational domain.

Secondly, this research offered an innovative solution to recruitment of mechanical trade workers for participation in the survey, by using targeted promotional animations to recruit participants directly through social media. Recruitment of working populations is difficult, as access to workers often requires employers to act as gatekeepers to information dissemination and survey completion. This innovative recruitment strategy offers a practical contribution to efforts to include under-represented workers in career development research, by accessing participants directly, at a time where they may be available to engage with an online activity.

Limitations

There are limits to the generalisability of the results of this research. In order to support the agricultural sector to address workforce issues of attraction and retention of mechanical tradespeople, the general domain of mechanical trade careers required investigation first, as these careers are under-represented in career development literature. The findings in relation to Study One and Two were applied to the agricultural industry in order to address the research aims. A thorough understanding of both the mechanical trade and agricultural domains, as well as the operationalisation and contextualisation of the research variables, supported the consistency of mechanical trade domain experiences across industry.

Readers should bear in mind, limits to the transferability of these research findings to domains outside of mechanical trade careers in Australia. For example, consistent with the theoretical implications of domain specificity within the SCCT research, these findings are unlikely to be transferable to SCCT persistence research with engineers in the academic domain. While mechanical tradespeople and engineering students may have some realistic

interests in common, the required skill sets, learning experiences, and outcomes of the two careers differ.

This reasoning in relation to the limits to transferability should also heed caution to attempts to generalise this research to other VET trades, such as carpentry or plumbing. While again, there are similarities between the learning environments within VET trained careers, there are also many elements to the skills and experiences within these careers that differ across domains. Any tradesperson would agree that there are quantifiable differences between a ‘grease monkey’ (a mechanic) and a ‘sparky’ (an electrician).

Finally, a common problem associated with psychological research is known as common methods bias, which relates to measurement error across the measurement model as a whole, rather than the constructs that the operationalised measures represent (Podsakoff et al., 2003). All aspects of data collection in relation to this study utilised direct feedback from participants, whether through interview or survey. Podsakoff et al. (2003) reiterate that this can become problematic when respondents try to respond consistently to retrospective accounts of their experience across a range of survey measures. There is potential that common method bias has influenced the outcome of this research, which could be strengthened by adding other forms of data to the prediction of outcome measures. In this instance, this could include directing future research to include additional objective sources of data, such as human resource records (i.e., rates of absenteeism or turnover rates) in order to measure actual verses intended persistence.

Future Research

There are multiple avenues to continue the research agenda of the VPA (McIlveen, 2015; McIlveen & McDonald, 2019) which stem from the findings of the current study into the career motivations of mechanical tradespeople in the agricultural sector. Considerations for the generalisability of the results and limitations of the research that were not able to be

addressed in the current study, lead to further possibilities of investigation when progressing vocational research with mechanical trade careers in agriculture.

In relation to the applicability of the SCCT to mechanical trade domains, further investigation is required in order to understand the role of mechanical trade self-efficacy in this context. This includes further development of the measure of mechanical trade self-efficacy and investigation of the predictive role of mechanical trade self-efficacy at various stages of career development. The question remains as to whether the role of self-efficacy differs across early career interest and choice modelling, in comparison to the current study investigating workers who have established their careers.

Additionally, this research raised some interesting questions in relation to the role of relational learning experiences as a mechanism of personal agency within the mechanical trade domain. Future research utilising the SCCT to investigate the career motivations of workers trained through VET systems, could investigate the relationship between perceptions of collective self-efficacy (Bandura, 2000) and occupational outcomes in the mechanical trade domain. Collective self-efficacy has been investigated in the context of teaching and professional careers (Goddard, 2001; Goddard et al., 2000, 2004), but has not been explored in the mechanical trade domain.

Future research could also continue investigation into the core role of outcome expectations in predicting the satisfaction and persistence intentions of mechanical trade workers. While this research supported the theorised operationalisation of outcome expectations via the MIQ and predictive utilising of ability utilisation in this context, there is much more work to be done with regards to the consistent operationalisation and measurement of outcome expectation variables with working populations. Finally, further research could explore the transferability this research to similar samples in the agricultural industry (i.e., VET trained parts-interpreters).

Conclusion

The current study adapted an integrative SCCT model of occupational persistence (Lent, Miller, et al., 2016) within the domain of mechanical trade careers, providing valuable insight into psychological factors that promote career satisfaction and persistence of mechanical trade workers within the agricultural industry. The findings support the use of an integrative SCCT model of persistence (Lent, Miller, et al., 2016) to inform practical strategies to assist the attraction and retention of mechanical tradespeople in the agricultural machinery sector. As well as practical recommendations, the current research presented theoretical implications for the SCCT, while also providing a unique methodological contribution to efforts related to participant recruitment of working populations.

This research project makes a significant contribution to the discipline of Vocational Psychology and the field of career development by adding to the limited literature in relation to both agricultural and VET trained careers. More specifically, this research supported the agenda of the VPA (McIlveen, 2015; McIlveen & McDonald, 2019) by utilising the POW (Blustein, 2006) framework and the SCCT (Lent et al., 1994; Lent et al., 2013) to investigate vital, yet under-represented working populations within the agricultural industry.

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Appendix A:

Study One Interview Proforma

University of Southern Queensland

Interview questions for study 1, to test face validity of model with specific population – Diesel Mechanics (DM) working in agricultural machinery (AG)

SELF-EFFICACY

Task-specific self-efficacy (confidence under normal conditions):

I'd like you to think back to the time when you considering what job you were going to choose when you finished schooling. Diesel mechanics perform tasks like dismantling engines, using hand tools, cleaning and repairing parts, testing machines.. How confident were you that you could successfully learn and do the tasks of a DM and use them in ag machinery?

Sources of self-efficacy beliefs: personal performance accomplishment (PPA), vicarious learning (VL), social persuasion (SP), and physiological/affective states (PA).

(PPA) *What can you tell me about your hands-on experiences, like dismantling, repairing or adjusting engines or machinery before you chose to work as a DM? What those experiences in mind, how confident were you in your hands-on mechanical skills before you chose the trade?*

(PA) Before you started your trade training and work as a DM, do you remember what it felt like when you worked on engines or used tools to repair parts?

(VL) Prior to starting work as a DM, can you tell me about any experiences you had where you watched other people working on engines or machinery and what that was like for you?

(SP) Was there someone in your life, like a family member, a friend or a teacher who encouraged you to pursue work as a DM? Can you tell me about that experience?

INTERESTS

What interested you about working as a DM in Ag?

Process efficacy (ability to manage generic tasks necessary for career prep, entry, adjustment, or change):

Can you tell me about your experience gaining your training and entering work as a DM?

Coping efficacy (ability to negotiate domain specific obstacles): What factors are the most useful in overcoming challenging work situations in your field?

What tasks or situations have you found most challenging about your work as a DM?

Can you tell me what's helped you to overcome these challenges?

Has there been any factors that have made challenging work situations more difficult?

Self-regulatory efficacy (ability to guide and motivate self to self-enhance despite deterring conditions):

What keeps you motivated to keep up your training and skills in the industry?

OUTCOME EXPECTATIONS Beliefs about the consequences or outcomes of performing particular behaviours (primary values met. Work values. Types of OE. Anticipated social, material, and self-evaluative.)

What did you expect the future would hold when you chose to work as a DM in ag?

Has working as a DM in Ag been what you expected?

(confirm task specifics in real world, compared to O*net) *Now that you are in the job, can you tell me some of the tasks or activities that you perform as part of your role in ag machinery?*

What do you expect now from your future in working as a DM in ag?

JOB SATISFACTION

How satisfied are you with your choice of working as a DM in AG?

ENGAGEMENT

What aspects of your work do you particularly enjoy?

GOALS Intention to engage in a particular activity.

Where do you see your career as a DM in Ag heading?

Appendix B:

Study Two Survey Measure - The Australian Survey of Mechanical Trade Careers

Australian Survey of Mechanical Trade Careers

This is a survey of the career experiences of Mechanical Tradespeople across industries in Australia.

To participate in the survey, we are seeking working apprentices and fully qualified Mechanical Tradespeople who are aged 18 and over - including, but not limited to automotive, light and heavy vehicle mechanics; motorbike and aviation mechanics; diesel mechanics; mechanical fitters and technicians.

It will most likely take 10-15 minutes to complete.

Participants can opt-in to enter a prize draw for 1 of 8 $100 Visa Gift Cards. The prize draw will be open until 30 October 2019. Participants can leave their contact details at the end of the survey, so they can be contacted if they have won a prize in the draw. The researcher will arrange for prize incentives to be delivered via registered post.

More information about the survey is contained in the link below.

By checking the box you consent to participating in the survey.

There are 22 questions in this survey.

Rate each item from strongly disagree to strongly agree as to whether you have had these types of learning experiences as a mechanical tradesperson.

Please choose the appropriate response for each item:

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1.1 While growing up, I watched adults whom I respect fix things.	◯	◯	◯	◯	◯	◯
1.2 I observed people whom I admire work outside in the yard.	◯	◯	◯	◯	◯	◯
1.3 I observed people whom I respect repair mechanical things.	◯	◯	◯	◯	◯	◯
1.4 I have observed members of my family build things.	◯	◯	◯	◯	◯	◯
1.5 I watched people whom I respect work in the outdoors.	◯	◯	◯	◯	◯	◯
1.6 People whom I look up to have urged me to pursue activities that require manual dexterity. (Activities that required you to skillfully work with your hands).	◯	◯	◯	◯	◯	◯

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1.7 While growing up, adults I respected encouraged me to work with tools.	◯	◯	◯	◯	◯	◯
1.8 Teachers I admired encouraged me to take classes in which I can use my mechanical abilities.	◯	◯	◯	◯	◯	◯
1.9 People I respect have urged me to learn how to fix things that are broken.	◯	◯	◯	◯	◯	◯
1.10 Family members have encouraged me to pursue activities that involve working outdoors.	◯	◯	◯	◯	◯	◯

Rate each activity from not confident at all to complete confidence. *

Please choose the appropriate response for each item:

	Not confident at all	Slightly confident	Moderately confident	Very confident	Completely confident
2.1 I can inspect and test mechanical parts of vehicles, equipment or structures. (For example, cars, tractors, trucks, earth moving equipment, buses, motorbikes, helicopters, pumps, rigs, assemblies and plant).	◯	◯	◯	◯	◯
2.2 I can diagnose faults with mechanical components of vehicles or equipment. (For example, engines, gearboxes, transmissions, brakes, filters, clutches, power, steering, hydraulics, sub-assemblies and mechanical systems).	◯	◯	◯	◯	◯

	Not confident at all	Slightly confident	Moderately confident	Very confident	Completely confident
2.3 I can service, maintain or repair mechanical components of vehicles or equipment. (For example, engines, gearboxes, transmissions, brakes, filters, clutches, power, steering, hydraulics, sub-assemblies and mechanical systems).	◯	◯	◯	◯	◯
2.4 I can use tools, instruments and equipment to perform mechanical tasks. (For example, screwdrivers, pliers, wrenches, pressure gauges, precision instruments, micrometers, callipers, calibration devices, power tools, jacks and hoists).	◯	◯	◯	◯	◯
2.5 I can operate vehicles and machinery as required for my mechanical trade role. (For example, forklifts, cranes, cars, trucks, tractors, earth moving equipment and mechanical plant).	◯	◯	◯	◯	◯

	Not confident at all	Slightly confident	Moderately confident	Very confident	Completely confident
2.6 I can use electronic and/or technology systems as required for my mechanical trade role, including to perform mechanical diagnosis, repair and adjustment. (e.g. electronic diagnostic tools).	◯	◯	◯	◯	◯
2.7 I can read and understand technical information (e.g. workshop manuals, technical drawings and fitting instructions).	◯	◯	◯	◯	◯

Rate each item from not important to very important in relation to your work as a mechanical tradesperson. *

Please choose the appropriate response for each item:

	Not important	Slightly important	Moderately important	Important	Very important
3.1 The chance to do the kind of work that I do best.	○	○	○	○	○
3.2 Being able to see the results of the work I do.	○	○	○	○	○
3.3 Variety in my work.	○	○	○	○	○
3.4 My pay and the amount of work I do.	○	○	○	○	○
3.5 My job security.	○	○	○	○	○
3.6 The job would provide an opportunity for skill advancement.	○	○	○	○	○
3.7 The chance to do work that is well suited to my abilities.	○	○	○	○	○
3.8 Being able to take pride in a job well done.	○	○	○	○	○

	Not important	Slightly important	Moderately important	Important	Very important
3.9 The chance to do something different every day.	○	○	○	○	○
3.10 How my pay compares with that for similar jobs in other companies.	○	○	○	○	○
3.11 The way my job provides for a secure future.	○	○	○	○	○
3.12 The opportunities for technical advancement in this job.	○	○	○	○	○
3.13 The chance to make use of my best abilities.	○	○	○	○	○
3.14 The feeling of accomplishment I get from the job.	○	○	○	○	○
3.15 The chance to do many different things on the job.	○	○	○	○	○
3.16 How my pay compares with that of other workers.	○	○	○	○	○

	Not important	Slightly important	Moderately important	Important	Very important
3.17 The way my job provides for steady employment.	◯	◯	◯	◯	◯
3.18 The chances for specialised skill progression in this job.	◯	◯	◯	◯	◯

Rate each item from strongly disagree to strongly agree in relation to your work as a mechanical tradesperson. *

Please choose the appropriate response for each item:

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
4.1 I do not give up quickly when something does not work well.	◯	◯	◯	◯	◯	◯	◯
4.2 I really do my best to get my work done, regardless of potential difficulties.	◯	◯	◯	◯	◯	◯	◯
4.3 When I start a job I pursue it to the end.	◯	◯	◯	◯	◯	◯	◯
4.4 I do my best to do what is expected of me.	◯	◯	◯	◯	◯	◯	◯
4.5 I am trustworthy in the execution of the tasks that are assigned to me.	◯	◯	◯	◯	◯	◯	◯
4.6 I really do my best to achieve the objectives of my organisation.	◯	◯	◯	◯	◯	◯	◯
4.7 I think of myself as a hard worker.	◯	◯	◯	◯	◯	◯	◯

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
4.8 I really do my best in my job.	◯	◯	◯	◯	◯	◯	◯
4.9 I put a lot of energy into the tasks that I commence.	◯	◯	◯	◯	◯	◯	◯
4.10 My effort is always consistent while I am doing my job.	◯	◯	◯	◯	◯	◯	◯

Please rate your level of agreement with the following statements from strongly disagree to strongly agree. *

Please choose the appropriate response for each item:

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
5.1 I feel fairly well satisfied with my present job.	○	○	○	○	○	○	○
5.2 Most days I am enthusiastic about my work.	○	○	○	○	○	○	○
5.3 Each day of work seems like it will never end.	○	○	○	○	○	○	○
5.4 I find real enjoyment in my work.	○	○	○	○	○	○	○
5.5 I consider my job rather unpleasant.	○	○	○	○	○	○	○

Please indicate your level of agreement with each statement using the following scale of strongly disagree to strongly agree. *

Please choose the appropriate response for each item:

	Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
6.1 I am thinking about leaving my job.	○	○	○	○	○
6.2 I am actively searching for an alternative to my job.	○	○	○	○	○
6.3 I intend to stay in my current job for some time.	○	○	○	○	○

Please rate your level of agreement with the following statements from strongly disagree to strongly agree. *

Please choose the appropriate response for each item:

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
7.1 I am satisfied with my choice of occupation.	○	○	○	○	○	○	○
7.2 I truly enjoy the occupation I have chosen.	○	○	○	○	○	○	○
7.3 Given another opportunity to choose careers, I would choose differently.	○	○	○	○	○	○	○

Please indicate your level of agreement with each statement using the following scale of strongly disagree to strongly agree. *

Please choose the appropriate response for each item:

	Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
8.1 I am thinking about leaving my current occupation as a mechanical tradesperson.	○	○	○	○	○
8.2 I am actively searching for an alternative to working as a mechanical tradesperson.	○	○	○	○	○
8.3 I intend to stay working as a mechanical tradesperson for some time.	○	○	○	○	○

Please think about your current workplace and rate each statement on a scale of strongly disagree to strongly agree. *

Please choose the appropriate response for each item:

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
9.1 My supervisor really cares about my well-being.	○	○	○	○	○	○	○
9.2 My supervisor shows very little concern for me.	○	○	○	○	○	○	○
9.3 My supervisor strongly considers my goals and values.	○	○	○	○	○	○	○
9.4 My supervisor is willing to help me when I need a special favour.	○	○	○	○	○	○	○
9.5 My supervisor takes pride in my accomplishments at work.	○	○	○	○	○	○	○
9.6 My coworkers strongly consider my goals and values.	○	○	○	○	○	○	○
9.7 My coworkers take pride in my accomplishments at work.	○	○	○	○	○	○	○

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
9.8 My coworkers really care about my well-being.	◯	◯	◯	◯	◯	◯	◯
9.9 My coworkers value my contribution to their well-being.	◯	◯	◯	◯	◯	◯	◯
9.10 My organisation is willing to help me when I need a special favour.	◯	◯	◯	◯	◯	◯	◯
9.11 My organisation shows very little concern for me.	◯	◯	◯	◯	◯	◯	◯
9.12 My organisation values my contribution to its well-being.	◯	◯	◯	◯	◯	◯	◯
9.13 My organisation strongly considers my goals and values.	◯	◯	◯	◯	◯	◯	◯

What is your age? *

ⓘ Only numbers may be entered in this field.
Please write your answer here:

What is your gender identity? *

ⓘ Choose one of the following answers
Please choose **only one** of the following:

◯ Male
◯ Female
◯ Prefer not to answer
◯ Other

How many years have you worked as a mechanical tradesperson, including time as an apprentice? *

ⓘ Only numbers may be entered in this field.
Please write your answer here:

How many years have you worked for your current employer? *

Only numbers may be entered in this field.
Please write your answer here:

What level of qualification do you hold? *

Choose one of the following answers
Please choose **only one** of the following:

- ◯ Currently an apprentice
- ◯ Qualified Mechanical Tradesperson
- ◯ Qualified Mechanical Tradesperson with specialised industry skill accreditation
- ◯ Qualified Mechanical Tradesperson with additional Diploma or Degree

What is your current work status? *

Choose one of the following answers
Please choose **only one** of the following:

- ◯ Employee only - more than 30 hours per week
- ◯ Employee only - less than 30 hours per week
- ◯ Business Owner Operator and Employee - more than 30 hours per week
- ◯ Business Owner Operator and Employee – less than 30 hours per week

What industry are you currently employed in? *

Choose one of the following answers
Please choose **only one** of the following:

- ◯ Agriculture, Forestry and Fishing
- ◯ Mining
- ◯ Manufacturing
- ◯ Electricity, Gas, Water and Waste Services
- ◯ Construction
- ◯ Retail Trade
- ◯ Other

What is your current job title?

Please write your answer here:

Please provide an estimate of your income from working as a mechanical tradesperson per year. *

Choose one of the following answers
Please choose **only one** of the following:

- ◯ Less than $24,000 per year
- ◯ $24,000-$45,000 per year
- ◯ $45,000-$83,000 per year
- ◯ $83,000-$100,000 per year
- ◯ $100,000-$120,000 per year
- ◯ $120,000 plus per year
- ◯ Prefer not to answer

What is your residential postcode? *

Only numbers may be entered in this field.
Please write your answer here:

What is the postcode or town where you work? *

Please write your answer here:

What is your citizenship status? *

Choose one of the following answers
Please choose **only one** of the following:

- ◯ Australian citizen
- ◯ Temporary resident
- ◯ Working Visa holder
- ◯ Other

Please leave your mobile or email contact details if you are interested in entering the prize draw for 1 of 8 x $100 Visa Cards.

Thanks for helping with this research - we appreciate each and every time someone has taken the time to respond - all the best with the prize draw!

Submit your survey.
Thank you for completing this survey.