Combining theory, survey methodology, and database technologies in support of an organizational climate improvement strategy

FOGARTY, G., & MACHIN, M.A.
fogarty@usq.edu.au
Centre for Sustainable Business Development
University of Southern Queensland

ABSTRACT

In this chapter, we introduce the organisational health model as a framework for investigating the role of climate within health settings. The collection of data via climate surveys is an important step in the management strategy we advocate. A key component in our approach is the use of a tailor-made database that stores survey data and has a graphical interface that allows managers with minimal statistical skills to conduct further analyses and prepare reports on the status of various psychosocial factors within the organisation. We have found this approach to be very effective and discuss how it can be used to improve the efficiency of organizational surveys.

The correct APA citation for this chapter is:
Fogarty, G. J., & Machin, M. (2013). Combining theory, survey methodology, and database technologies in organizational climate research. In R. Lacey (Ed.), *Advances in Organisational Research Methods and Analysis*, pp. 86-98. New York: Chamber & Row.

Introduction

The practice of using surveys to collect data on various aspects of organisational functioning is widespread. Indeed, the practice is currently so widespread that one may be forgiven for thinking of it as yet another management fad, something that appears on the scene, mushrooms, and then disappears. A real threat to the long-term use of surveys is that they are seen as requiring so much expertise that they are usually outsourced and are likely to be the first things to go when budgets start tightening. The main purpose of this chapter is to describe a database application that will help to lift organizational surveys above the level of a "fad" and to place them among the tools that managers understand and can access on a regular and ongoing basis. We begin by outlining some of the more general pitfalls that have always plagued organisational surveys. We draw these examples from our own extensive experience conducting surveys in private and public organisations.

In our experience, the main challenges facing organisational surveys are as follows:

- The request for a survey is not driven by a clear model of how the findings can improve organisational outcomes.
- The resulting questionnaire is too-often a one-off survey that lacks established psychometric properties, benchmarks, and an established pattern for communicating results to staff and making use of findings in organisational improvement initiatives and strategic planning.
- Interpretation of survey findings remains the exclusive province of experts, without whose help, little can be done by the organisation itself.

These problems – and a great many others - are being addressed through books such as Kraut's (2006) *Getting Action from Organizational Surveys: New Concepts, Technologies, and Applications*, a publication that emerged as part of the J-B SIOP Professional Practice Series. Interestingly, among the 24 chapters of Kraut's edited volume, there are only two that deal with computer software and they both concern online surveys. There are none that deal with the third dot point listed above. We believe that this is a much-neglected area in organizational psychology.

In the following pages, we present a brief overview of a case study involving an organisational improvement initiative which we helped to promote and develop within a large Australian organisation. The case study illustrates many practices that are directly applicable

to any organizational setting and introduces the key theme of this chapter: developing tools that assist organizations to analyse and manage their own survey data.

CASE STUDY

This case study will outline the way in which we have addressed the annual organisational climate survey requirements of Queensland Health, beginning in 1998. We will give an anecdotal account of the programme from its very beginnings to enable the reader to understand why it evolved in the way that it has and how we have been able to bring the organization itself into the data analysis and data management aspect of their regular climate surveys.

Beginnings

The programme began in 1998 when we were requested to conduct an organisational climate survey of staff employed by a local health district. We were fortunate in that the survey was requested by the Organisational Improvement Unit of Queensland Health and the people involved had already paid for the development and validation of an organisational climate survey that they intended to use right across this very large organisation. Our clients also had some ideas about how the survey findings would be used.

Our first hint of a problem occurred after we had analysed the survey data using the *Statistical Package for Social Scientists* (SPSS) and had written a major report for the organisation. The report was well-received and we were requested to prepare feedback reports for sub-districts. There were only six of these, but we could already see that there would be problems down the track if we were asked to work across the whole organisation and to prepare reports for the large number of sub-districts. The second concern for us was that as the managers read the contents of the reports, they kept coming back to us with further questions, most of which they could have answered themselves had they been able to analyse their own data.

The Programme Matures

As the client base broadened and we came into contact with managers who were less familiar with the potential benefits of organisational climate research, we embedded our survey work within a broader model of organisational functioning. We began by identifying the goals of the programme, the focus of the programme, and the assumptions upon which the underlying organizational health model is based.

- Goals of Programme:
    - Identify the key aspects of organisational climate requiring improvement.
    - Apply appropriate benchmark data to assess overall performance.
    - Plan an organisational improvement strategy using data collected from an employee survey.
    - Involve the senior leadership in strategic planning to facilitate change.
- Focus of Programme:
    - What are the critical factors that drive performance?
    - How do we measure them?
    - How can the organisation use this information to improve performance?
- Assumptions About Healthier Workplaces:
    - Healthier workplaces have a better organisational climate.
    - Healthier workplaces lead to increased productivity and fewer errors.
    - Healthier workplaces have a better work-life balance.
    - Healthier workplaces offer opportunities for growth and development.
    - Healthier workplaces value health and safety.
    - Healthier workplaces offer recognition.
    - Healthier workplaces encourage and support employee involvement.

This simple theoretical framework proved to be very acceptable to managers and easily assimilated into their strategic planning. It is a framework that is also highly transportable across industries and sectors, including military settings, as we shall shortly see.

Developing a Standard Methodology

For many years, our standard methodology consists of the following steps:

- Participation in the organisational planning and communication processes that precede survey administration.
- Use of surveys, administered via the Web wherever possible.

- Measuring the same set of core constructs across organisations and repeatedly within organisations.
- Preparing individualised reports and briefings for sections within organisations.
- Holding face-to-face meetings with all levels of management and including our own team leaders and technical staff in these meetings.
- Regular follow up and review.

Once the model and the methodology were refined, we found ourselves in a situation where we had a strong client base committed to the use of organisational climate surveys and accepting of the constraints that benchmarking imposes. We were making progress on the technical front too, but here the gains were much more difficult to come by, as we now explain.

Development of the *Total-Ideas* Database for use by Managers.

Our link with QLD Health has now extended beyond 15 years. We have developed our own organizational climate survey and our client base has extended to include other public sector organisations. Along the way, we have encountered some major hurdles. The one that forms the central theme of this chapter is the large number of post-survey requests we receive to conduct further simple statistical analyses, usually with a view to making comparisons between groups or between years. In a large organization, such as Queensland Health, the number of potential groups is daunting and it is not possible to specify all the comparisons of interest in advance. The need for some comparisons emerges only when results are examined at a local level.

In order to improve the quality of benchmark-driven decision making within our client organization and, equally importantly, to relieve the need for all follow-up analyses to be conducted by our team, we developed an interactive database that we called *Total-Ideas*. This database enables managers to produce graphical representations of the psychological outcomes as well as the organisational climate variables for subgroups within the sample down to as few as 10 respondents (for confidentiality reasons, group size cannot be smaller than 10). This process allows managers to identify work areas that are reporting better (or poorer) psychological outcomes and to compare the organisational climate variables for those areas with other areas. It is also possible to compare current and past results. The features of this database are as follows:

- The database sits on an SPSS or Excel file.
- It now contains responses from over 50,000 employees.
- It allows for many comparisons, limited only by the nature of the demographic data collected.
- It protects confidentiality of respondents.
- It is updated regularly by our team.
- The database can be operated by organizations with just a small amount of training.
- The statistical experts are no longer the only source of follow-up analyses and reports.

A Glimpse at the *Total-Ideas* Interactive Database

The demographics section of each survey is always extremely important and the source of much discussion in the planning stages of all our projects. From our point of view, we would like this section to be as stable as possible because the information captured here forms the basis of between-group comparisons within the organisation and across organisations. A key requirement of the interactive database is that it would allow simultaneous comparisons between up to 10 groups that can be identified on the basis of demographics.

The screen shown in Figure 1 is the key to the interactivity that is built into the database. The data are already stored in an SPSS or Excel file – the research consultancy team is still needed for that step. The client then chooses the comparisons to be made from this screen by the simple process of pointing and clicking. In the example shown in Figure 1, there is to be a two-group comparison. The database for the first group is then selected and the elements of that group are chosen by clicking various levels of the demographic variables. If the whole group is to be used, and not particular elements of it, then there is no need to tick any of the boxes. The default selection is ALL.

The process is repeated for the second group, beginning with the data set from which that group will be drawn. The analysis could be something as simple as 2005 data versus 2007 data, or it may be 31-50 yr old male respondents who have a degree (as depicted in Figure 1) versus some other configuration that is specified in the “Define Group 2” screen. [One popular comparison is results for the current year versus results for the previous survey administration for a particular work location.]

Having defined the groups or datasets to be compared in this fashion, clients then click on the “Criteria Selected” button at the top left of the screen to choose the variables or groups of variables (in the present case) to be analysed.

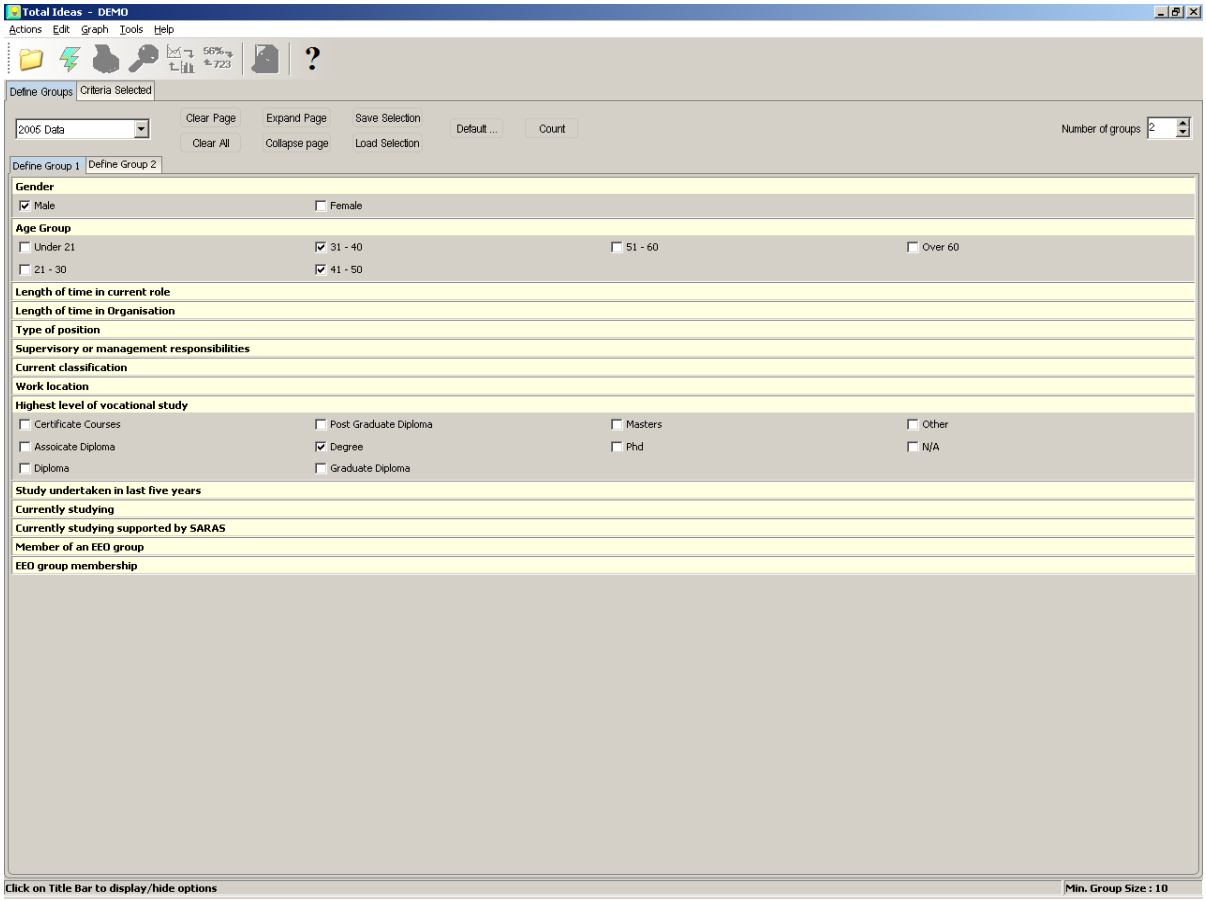

Figure 1. Interactive database showing set-up for group comparisons.

It is then a relatively simple matter to select the variables on which comparisons are to be made. Once these variables have been chosen, a tab will appear for that variable or cluster of variables. Clicking on the lightning bolt at the top of the screen triggers the analyses.

Obviously there is a lot of behind-the-scenes work that has to be done by the technical/statistical team before such a simple interface can produce the analyses the client wants. The importance of getting the demographics right is also evident when you consider that this screen covers all the possible breakdowns. The different levels of the demographic variables only become evident when a particular variable is selected. In Figure 1, “Highest level of vocational study” has been selected and we see an exploded view of its various levels, only one of which has been ticked. Using this technique, a large number of

demographic variables can be represented on a single screen, reinforcing the simplicity of the interface.

Once the variables and their desired levels have been ticked, the client can produce graphical representations of group differences, such as the one shown in Figure 2.

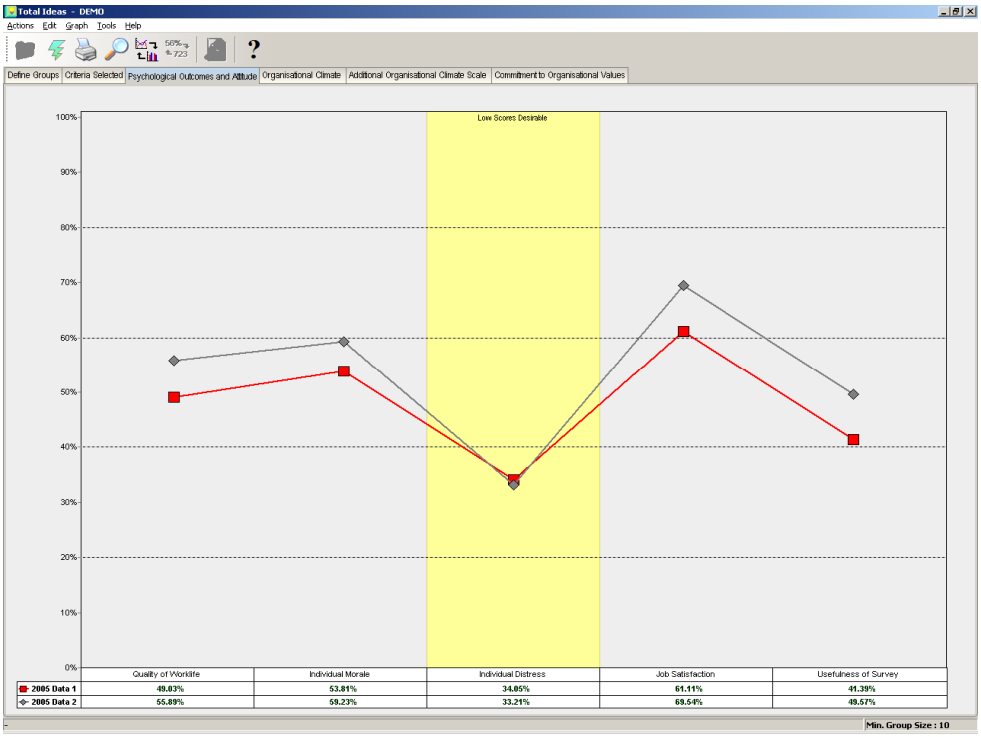

Figure 2. Interactive database showing group comparisons in graphic form.

Some of the output features of *Total-Ideas* can be seen in Figure 2. Line graphs are used here but histograms are another option. The table at the bottom of the figure contains the statistics that form the anchor points for the lines so that the reader does not have to refer to the axes to know their precise value. Graphic representations for other variables can be obtained by clicking the tabs at the top of the screen. These graphs and tables can then be copied and pasted into Word documents or Powerpoint slides.

Figure 3 shows some of the versatile features of the database. Instead of showing the mean scores, frequency counts are displayed for a particular scale.

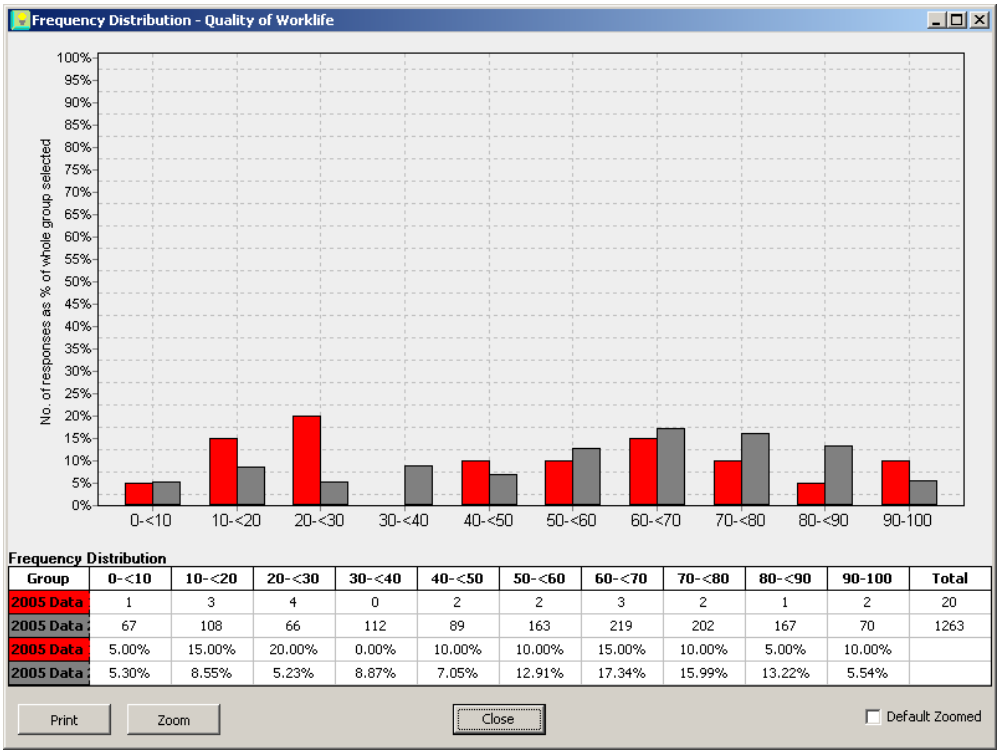

Figure 3. A different view from the interactive database.

Implementing Rasch-based Measurement

The interactive database has been popular with our clients who appreciate the opportunity to compare their own statistics with benchmarks and the opportunity to explore the database without coming back to us all the time. We have also continued to improve the database. One major improvement involved switching from comparisons based on raw scores to Rasch-based analyses. We made this change because the problem with benchmarking is that differences between scores mean different things, depending on their whereabouts on the distribution of scores. Thus, an improvement of five percentage points in the vicinity of the mean is likely to represent a substantial leap in the rankings because approximately 68% of the scores will fall within one standard deviation of the mean. An improvement by the same margin towards the edges of the distribution will not have the same relative impact.

Rasch modelling has its roots in the pioneering measurement works of Guttman (1944) and Thurstone (1928). Accounts of its use with attitudinal data can be found in Andrich (1981) or Tenenbaum and Fogarty (1997). The Rasch method yields person measures and item values that are independent of each other. Both represent points on linear continuums and both rely on measurement units called logits that have a true zero point with equal units of measurement extending in either direction. The benefit of incorporating Rasch measurement into our interactive database is that we can track change more reliably. Thus, a

change of two logits from one year to the next has the same meaning, wherever on the scale the logits appear.

The noteworthy feature of the Rasch analysis in our *Total-Ideas* database is that it all happens behind the scenes. There is no need to reformat and transport the data to another platform, such as a dedicated Rasch analysis package. The client continues to use the same software interface with mathematical routines in the database converting raw scores to logits. The other features of the interface remain the same, thus minimising training requirements even when such fundamental changes are made to the measurement operations.

How it All Works in Practice

What we have described above is clearly a mature research programme, with the longevity (15 years) of the researcher-client partnership testifying to the client's satisfaction with the database technology. What remains to be done in this chapter is to describe the implementation process itself so that the reader can judge whether or not the development of such a database is within reach.

The first point we would make is that the database produces descriptive statistics only. It is not a substitute for a statistical package, such as SPSS. We did things this way because our experience writing survey reports for business users has convinced us that the primary data-analytic requirement is a package that produces high quality graphs that depict frequency counts and group means. We therefore avoided the trap of making too many features available with consequent steep (and prolonged) learning curves for staff in the organization. [The original training manual for *Total-Ideas* was just four pages long]. The sophisticated elements of the software – for example, the Rasch analyses - have minimal impact on the user interface. It remains a simple tool for producing a wide variety of graphs and tables for insertion into reports.

The second point is that the resource requirements for the development of the package were not excessive. Once we had tested the feasibility of the concept, significant amounts of programming time were needed to build the interface shell and the various templates. Considerable input was also required from the research team and the clients. Once these initial goals were achieved, we had a software package that could be adapted to suit almost any survey format. These adaptations are required almost every time we run a survey but they are relatively minor and are charged to the client.

Total-Ideas is located on a secure server. Clients who wish to use it for follow-up analyses need web access. They download a small client application that runs on their

desktop computers. Organization-specific logons and passwords are supplied to clients who request access to the database and they then proceed to produce all the graphs, tables, and reports that they need. Not all clients request the ability to conduct their own analyses, in which case the research team produces the management reports and handles follow-up queries. *Total-Ideas* is still very helpful in this situation because a large number of graphs can be produced very quickly by the research consultancy team. Much more quickly than with SPSS, Excel, or other popular packages.

If higher level analyses are required - for example, there may be a need for statistical modelling - the research team takes over again because *Total-Ideas* is not capable of performing this work. We use dedicated packages such as SPSS, AMOS, or MPLUS for this level of work.

Summary

The innovative aspect of this database is that, with just a small amount of training, clients can produce most of the graphs and tables they want using the measurement techniques that underpin Rasch analysis. The combination of survey methodology and database reporting technology has worked well for us in the public sector where there is a strong demand for measures of organisational climate and a commitment to obtaining maximum benefit from these measures.

Since we started work on *Total-Ideas*, some commercial web-based tools have appeared on the scene. *SurveyMonkey* is one of the best-known examples. There is no doubt that much can be accomplished with these applications too but we see them as general purpose, do-it-yourself tools that will suit an organization that wants to run one-off surveys where the data storage requirements are simple. *Total-Ideas* is better suited to situations where there is collaboration between an in-house team with sufficient expertise to use the application long after the survey has been completed and a research consultancy team that can make changes to the software (if such changes are needed) and to update and maintain the stored data so that comparisons can be made between current and past surveys. The skills required for this last task are rarely found in-house and are not part of commercial online survey applications. In fact, although we have not written about it here, the most time-consuming and difficult element of the whole process for us is the background data management, establishing comparability between ever-changing work locations and occupational groupings. Although data management is a necessary task regardless of the

statistical package used for graphs and tables, there is no doubt that a good part of the success of *Total-Ideas* can be attributed to the quality of the underlying data management.

Conclusion

It is clear from publications such as the one by Kraut (2006) that organizational psychologists find themselves in a period where organizations are making wide use of survey methodology to assist in managing human resources. It is difficult for personnel with expertise in survey methodology to keep up with the demand, especially when dealing with large organisations that require tailored reports for sub-sections of the organisation. Our message in this chapter is that part of the solution lies in the introduction of database technology to assist with data analysis and report preparation. If all requests for analysis have to go to a central point, that central point will quickly become a bottleneck and the impact of the survey will be lost. The role of organizational psychologists is to communicate with managers to help build the strategic frameworks for organisational surveys. We need to make better use of technology to help with the more mundane tasks of data analysis and reporting so that as much as possible of this work can be done quickly and efficiently within the organization itself.

REFERENCES

Andrich, D. (1981). *Rasch's models and Guttman's principles for scaling attitudes*. Paper presented at the International Conference on Objective Measurement. Chicago: The University of Chicago, Department of Education.

Guttman, L. (1944). A basis for scaling quantitative ideas. *American Sociological Review, 9*, 139-150.

Kraut, A.I. (2006). Getting action from organizational surveys: New concepts, technologies, and applications. Pfeiffer:

Tenenbaum, G., & Fogarty, G. (1997). Applications of the Rasch Analysis to sport and exercise psychology measurement. In J. Duda (Ed.), *Advancements in sport and exercise psychology measurement*. Morgentown, M.V.: Fitness Information Technologies.

Thurstone, L.L. (1928). The measurement of opinion. *Journal of Abnormal and Social Psychology, 22*, 415-430.

Acknowledgements

The work we have described includes significant contributions from Dr Majella Albion, Dr Jeff Patrick, Dr Hong Eng Goh, and computer technicians Mr Ross Bool, Mrs Susie Gibson, Mr Simon Fawell, and Mr Ken Askin.