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THESIS ACCEPTED IN SATISFACTION OF THE
REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

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**Investigating the role of state school principals' feelings of
empowerment affecting transformational leadership
in effective school governance:
Empirical testing of a structural model**

Graeme Charles Rose

Bachelor of Commerce, Master of Economics

Note: the Errata/Addenda
are affixed to the end of the thesis

**Submitted in total fulfilment of the requirements of the degree of
Doctor of Philosophy**

February 2004

**Department of Accounting and Finance
Faculty of Business and Economics**

Monash University

Dedication

This thesis is dedicated to my parents, Ronald and Esma Rose,
my wife, Judith
and my daughters Stephanie, Georgia and Alexandra.

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Abstract

The purpose of this thesis is to gain an understanding of the extent to which managers' feelings of empowerment and transformational leadership influence effective governance. The research focuses on principals of large state schools following a government decentralisation initiative. Locating the research in this way addresses the identified need to undertake research into psychological empowerment within particular organisational contexts.

Specifically, the aim of the research was to find support for a model developed from a partial nomological network of psychological ('felt') empowerment. This model comprised antecedents to psychological empowerment (locus of control, role clarity, self-esteem, value of strategic information and availability of resources), and outcomes (innovation via transformational leadership). Each factor in the model was conceptualised as a latent variable; psychological empowerment and transformational leadership were hypothesised as multidimensional (second order) latent variables.

A survey design was used to test the relationships described in the model. 1,051 survey forms were sent to the population of principals and assistant principals of large Victorian State schools, resulting in 539 usable responses. The model was tested using a two-stage process with structural equation modelling using LISREL 8.54 (Jöreskog, K. G. *et al.* 2003). First, confirmatory factor analyses tested the efficacy of the latent variables. Second, latent variables that demonstrated adequate validity were incorporated into a revised structural model where tests of overall fit were undertaken and hypotheses tested. Overall, empirical analysis provided support for this revised model.

In summary, role clarity and availability of resources were found to be positively associated with psychological empowerment, although, unexpectedly, the relationship between the value of strategic information and psychological empowerment was negative. Support was found for a positive, though modest, relationship between psychological empowerment and transformational leadership and for a strong positive relationship between transformational leadership and innovation in management structure.

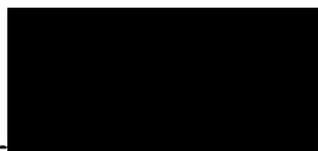
The findings suggest that providing principals with both adequate resources and an understanding of their role increases their sense of empowerment. They also suggest that principals' feelings of empowerment play a role in effective governance by increasing their levels of transformational leadership. The surprising negative association of the value of

strategic information and principals' feelings of empowerment is discussed; it is attributed to the compulsory nature of the generation of this accountability information.

While findings shed some light on factors that affect psychological empowerment, its hypothesised effect upon transformational leadership was found to be only modest. This confirms prior research, undertaken within the private sector, which produced a similar result, and questions the extent to which providing a sense of empowerment produces a transformational leader. Although the stated aims of introducing school-based management into state schools included the need to bring about improvements to student learning, this initiative has not influenced transformational leadership strongly. Future research needs to be focused on other factors that influence transformational leadership such as management education and training. Results of this thesis provide support for the notions that transformational principals bring about innovation within their schools' management systems, and increasing this quality produces positive outcomes.

Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other institution and affirms that, to the best of my knowledge, the thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.



Graeme Charles Rose

Acknowledgements

Debts of gratitude are owed to a number of people who have assisted me with the completion of this thesis. Foremost of these is my supervisor, Professor Kim Langfield-Smith, whose thoughtful support and constructive criticism has kept me focused and on target throughout the process. Most especially, however, Professor Langfield-Smith has allowed me to progress at my own pace and has trusted in my ability to produce what was required to complete the task. To her I express my warmest thanks.

I also express my gratitude to the principal class officers (PCOs) who assisted me in the development and testing of the survey forms used to collect data. They include Ken Cunningham, Barbara Grant, Tom Greene, Leon Kildea, Lesley Lamb, Robert Lamb, John Pech and Judy Rose.

Thanks also go to those PCOs who completed and returned the survey forms, ensuring an adequate sample size. Most especially I wish to thank Mr Edward Brierley, president of the *Victorian Association of Secondary School Principals*, for his letter of support included in the survey kits sent to the population of Victorian State school principals. I attribute the high response rate, to a large degree, to this assistance.

To the members of staff in the Schools of Business at Charles Sturt and La Trobe Universities and the Department of Accounting and Finance at Monash University I also express thanks, especially to Heads of School at the Charles Sturt University School of Business, Associate Professors Michael O'Mullane and Norm Philp.

I also thank all my friends and family who have been supportive throughout the process. They include my sisters Heather Leary and Margaret Milne, their husbands John and Gary, parents-in-law Margaret and Keith Molloy and friends Graeme Blanch, Gavin Frawley, Jenny Murray, David Nelson, Lyn and John Patrick, Gigi Simpson, Peter and Frances Vaughan.

Thanks to Nada Cunningham for assistance with final proofing.

Chapter 1

Introduction

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Chapter 1

Introduction

1.1 The research question

The aim of this thesis is to provide a better understanding of the role of psychological (felt) empowerment and transformational leadership in the governance of state schools. This aim provided the motivation for the research, focusing on the role of their operational managers, principals. The thesis is conducted following the recent implementation of a decentralisation initiative involving a transfer of decision-making responsibility and accountability to schools from the central bureaucracy (the Victorian State *Department of Education, Employment and Training*¹). The research question is stated as follows.

Do psychological empowerment and transformational leadership play a significant role in the governance of state schools following decentralisation?

This question arises from the convergence of two issues in organisational and educational administration that are often discussed in both academic and practitioner-based literatures. The first issue is located in the organisational literature and focuses on the development of a nomological network² of psychological empowerment within a work environment. The second issue, located in the education administration literature, involves examination of the effect of increased authority for public school principals' decision-making authority and responsibility. Both issues have implications for accountability since this has been increased as part of the package.

With respect to principals, the thesis proposes and tests the following.

¹ Departments of education change name from time to time as determined by the government of the day. Throughout this thesis the education department of the State Government of Victoria is referred to using its title at the time of data collection; that is the *Department of Education, Employment and Training*. At the date of submission of this thesis its title is the *Department of Education & Training, Victoria*.

² A nomological network is defined as a theoretical framework that specifies relationships among variables in such a way as to help both differentiate and define the variable of concern and that enables the formulation of a measurement model (Cronbach & Meehl 1955).

- A model describing the role of psychological empowerment and transformational leadership in governance and accountability;
- appropriate measurement of psychological empowerment;
- appropriate measurement of transformational leadership;
- factors that influence psychological empowerment;
- factors that influence transformational leadership; and
- the effects of transformational leadership on innovations made to management structure within their organisations.

Empowerment is a variable that links individual strengths and competencies, natural helping systems and proactive behaviours to social policy and social change (Rappaport 1981, Rappaport 1984). It is a process by which people, organisations and communities gain mastery over issues of concern to them (Rappaport 1987). 'Psychological' empowerment is a conceptualisation that captures the extent to which an individual perceives himself or herself to be empowered (Spreitzer 1995a).

Unlike previous research involving investigation of psychological empowerment in the workplace generally, this thesis examines the concept as it relates to higher-level managers. Further, the thesis extends knowledge by investigating the role played by psychological empowerment within a government department subject to recent decentralisation processes. In order to undertake this examination, a model is developed that identifies psychological empowerment as a four-dimensional concept, identifying certain antecedents and outcomes.

This chapter is organised as follows. The next section, Section 1.2, contains a discussion and presentation of the research motivation justifying the thesis, identifying and addressing gaps in the literature. Section 1.3 contains a summary of the research method employed, with Section 1.4 containing an outline of the thesis. In Section 1.5 definitions of operational definitions and other terms are presented, Section 1.6 containing a number of limitations of scope and key assumptions. The chapter concludes with a summary in Section 1.7.

1.2 Motivation for the thesis

There is little in existing literature that explains the effects of devolution of decision-making responsibility, either on the managers who are in receipt of such responsibility, or

on the governance of the organisation they manage. Nowhere is this more in evidence than within the public sector. The most likely explanation for this lack of understanding is that government reforms are relatively new and that they have arisen out of emerging beliefs relating to the shape of public sector governance. Whatever the motivation for these initiatives, little research into their effectiveness has taken place to date.

In response to the identified need for future research within diverse organisational settings (Spreitzer 1995a)³, this study tests the generalisability of earlier findings by locating data analysis in a large government department. Since the early 1990s governments have sought to improve governance within the public sector, with the aim of improving efficiency and effectiveness in the execution of government policy. Following the lead of private sector reforms, many of these government initiatives have involved the devolution of decision-making powers to operational units from large bureaucratic centres. Such was the motivation of the Victorian *Department of Education, Employment and Training* with the introduction of an initiative known as *Schools of the Future*.

The motivation for this thesis arises from a desire to investigate control issues emerging from an organisation undergoing management system change. The purpose is, therefore, to explore developments within a government department in search of an appropriate system of governance in order to maximise its quality outcomes.

Where decentralisation has occurred, it is of research interest to identify the effects on managers in receipt of such responsibility. Moreover, it is of interest to investigate the extent to which managers perceive the scope of their newly acquired decision-making powers. More importantly for theory and policy development, however, research is required that identifies the factors that contribute to this psychological ('felt') empowerment for individual managers and to identify effects of this on their management practices. While large corporations and governments expect high benefits from change policies such as decentralisation, little is known of their effects. Research is required that seeks to identify and explain the outcomes of this policy at the individual manager level.

The role of psychological empowerment is investigated in this thesis by way of an examination of a decentralisation initiative of the State of Victoria, Australia. It involves

³ In her doctoral thesis, Spreitzer specifically identified the need to conduct future research into psychological empowerment using structural equation modelling and conducting the research within service-oriented, not-for-profit, governmental organisations (Spreitzer 1992).

devolution of decision-making power from the centralised bureaucracy of its *Department of Education, Employment and Training* to the principals of its constituent schools. Under this initiative, entitled *Schools of the Future*, principals have received increased decision-making authority relating to the allocation of resources within their schools (Caldwell 1998a). This increase in authority has come to these managers through organisational policy changes; that is, as a result of management practices arising from 'situational attributes' (Thomas & Velthouse 1990). It is accompanied by corresponding increases in requirements for accountability. Verification is sought for the generalisability of a nomological network of *psychological empowerment* in the workplace. This network was developed from that proposed by Spreitzer (1995). In summary, there are three main gaps in the literature that are addressed in this thesis.

First is clarification of the conceptualisation of psychological empowerment as a multi-dimensional variable. This is the view proffered by Zimmerman (1995), who suggested that considering empowerment as a unidimensional variable may promote an overly individualistic conception of empowerment and may limit the understanding of the variable. To overcome this, Zimmerman suggested that future research is required that considers, among other things, environmental influences and organisational factors. This thesis addresses these concerns by locating the thesis within a clearly defined setting.

Second is investigation of the role of psychological empowerment in the management context by modifying and extending the nomological network proposed by Spreitzer (1995a). In her study, Spreitzer identified four antecedents to psychological empowerment (locus of control, self-esteem, access to information and rewards) and proposed direct links from psychological empowerment to managerial effectiveness and innovation in management structure. The model proposed retains all these antecedents except for rewards⁴ and includes, additionally, availability of resources and role clarity. Rather than proposing a direct link between psychological empowerment and innovation (as is proposed by Spreitzer), transformational leadership is included as an intervening variable. The final link describes the impact of innovation on management effectiveness. Although the last of these links is included in the model, it is not tested statistically due to the inherent problems in measuring the variable and attributing it to one factor. The model is

⁴ The antecedent 'access to information' is modified in this thesis to *value of strategic information* in order to align the variable with the experiences of Victorian state school principals.

contained in Figure 1-1. A more detailed discussion of the model and its development is contained in Chapter 3.

Third, from a practitioner and policy development perspective, the thesis contains an examination of the effects of policy changes on governance within a large government department recently subjected to a decentralisation initiative. It provides an opportunity to investigate the results of the changes and, to some extent, to measure and evaluate the outcomes.

1.3 Research method

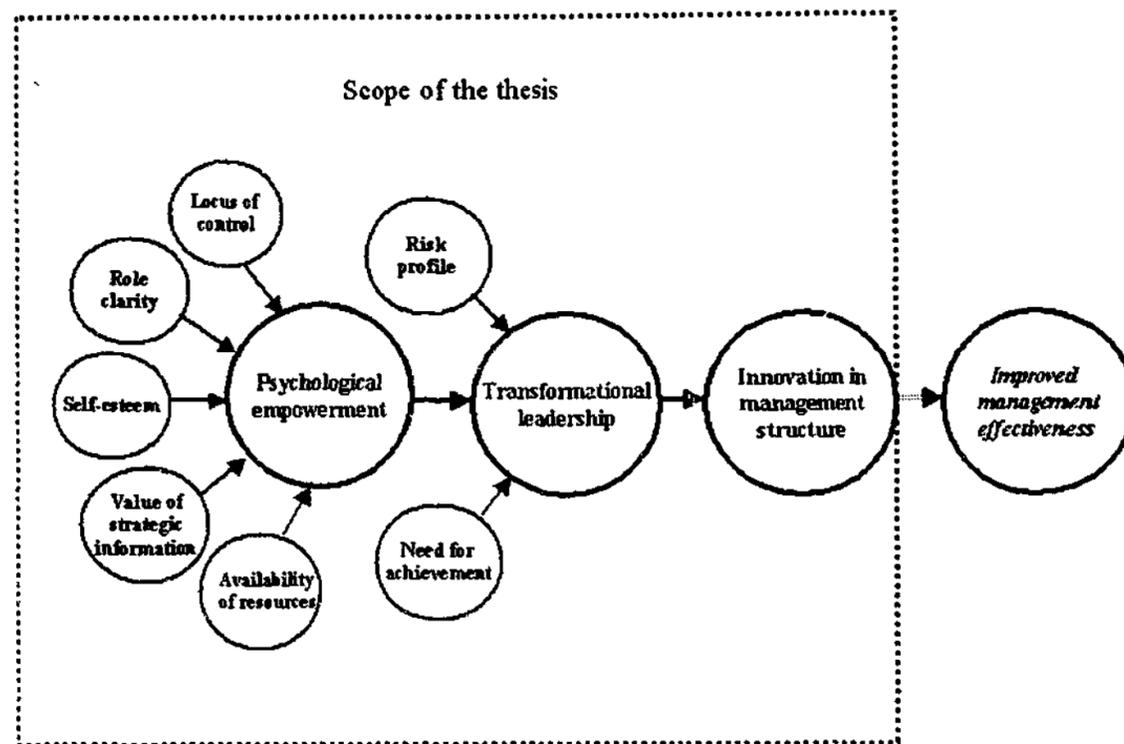
Data collected for hypothesis testing purposes were obtained using the survey method. The research question calls for a method that suggests causes for phenomena and this thesis tries to locate these causes by comparing cases and identifying whether the variance of one factor is systematically different from variances of other factors. Marsh (1982, p. 7) states,

... in survey research the process of testing causal hypotheses, central to any theory-building endeavour, is a ... process of drawing inferences from already existing variance in populations by a rigorous process of comparison.

Since the population of interest (principals of large Victorian State schools) is relatively small and readily accessible, a census survey⁵ was undertaken. That is, an attempt was made to collect data from all members of the population.

⁵ This is in contrast to a sample survey where inferences are made about the population based on the responses of a sample drawn from that population.

Figure 1-1 Summary diagram of hypothesised model



The survey was administered to principals and assistant principals of state schools via mailed survey forms. Schools determined as being suitable for inclusion in the survey were those large enough to be entitled, under the regulations of the *Department of Education, Employment and Training*, to the employment of an assistant principal. For the purposes of this thesis, small schools were not thought to be relevant to the study due mainly to the absence of complex management issues. Only matched pairs (principals and assistant principals from the same school) were included in the statistical analysis. This ensured the proper alignment of the perceptions of assistant principals with their own principal. In total, 539 usable matched pair responses were returned.

Questions used to measure components of the model were developed from scales already validated in the literature. Where such scales were unavailable, measures were developed separately, based on an understanding of the phenomenon to be measured. To the extent that it is possible, measurement questions were adapted to the understanding of the units of analysis, state school principals. To assist with this process, measurement questions were

tested for their appropriateness using a number of interviews and a pilot study carried out with a small number of principals and assistant principals.

Statistical analyses were undertaken using structural equation modelling (SEM), a multivariate technique combining aspects of multiple regression and factor analysis to estimate a series of interrelated dependence relationships simultaneously (Hair *et al.* 1998). First, measurement models were tested for unidimensionality using confirmatory factor analysis (CFA) using SEM and applied to first-order and second-order measurement models. Second, SEM was used to test the structural model describing hypothesised causal relationships between latent variables.

CFA revealed that analysis could proceed with three first-order measurement models for psychological empowerment (competence, impact and self-determination) and three first-order models for transformational leadership (charisma, inspiring subordinates and strategic vision and articulation). In addition, CFA revealed that analysis could proceed with three first-order antecedents to psychological empowerment (value of strategic information, availability of resources and role clarity), as well as the single measurement item for innovation in management structure. Following CFA, the statistical analysis concluded with the testing of the structural model constructed from the hypothesised links between key concepts. Using SEM, analysis of the structural model, using the weighted least squares estimation method, produced adequate levels of fit and statistically significant relationships.

1.4 Thesis outline

The purpose of this section is to describe the structure of the thesis and the contents of each chapter. This provides an overview of the thesis in condensed form. Following this introductory chapter, Chapter 2 contains a description of the environment within which the units of analysis (Victorian state school principals) operate. It contains a description of the public sector and some of the changes introduced over the past decade both within Australia and internationally. Similar descriptions of changes in state education are included in this chapter, with particular focus on changes introduced by the State Government of Victoria from 1993.

Chapter 3 contains a review of the literature upon which the research question and the model that summarises the hypotheses are developed. It contains detail of the background

to the development of all concepts incorporated in the model, along with support for the hypothesised links between those concepts.

The purpose of Chapter 4 is to present a description of the research design employed to identify support for the model developed in Chapter 3. It contains an outline of the research design, measurement questions, data collection procedures and the design limitations.

Chapter 5 contains a summary of the aims and processes of statistical analysis undertaken to test the hypotheses. It includes an outline of the role played by structural equation modelling (SEM) in the testing process as well as descriptions of tests used to determine whether the data are suitable for SEM testing (for example, tests of normality, multicollinearity and reliability).

The purpose of both Chapter 6 and Chapter 7 is to present the results of hypothesis testing. Chapter 6 contains a description of the CFA results, testing whether measurement models meet the criteria necessary for the creation of composite variables identifying measurement models suitable for analysis of the structural model. Results of structural model testing are contained in Chapter 7.

The final chapter, Chapter 8, contains a report of the research findings and conclusions, as well as contributions for both theory and policy development. A number of limitations are described, along with some recommendations for future research.

1.5 Definitions

Definitions adopted by researchers are often not uniform, so key terms are defined to establish positions taken in this thesis. This section contains a description of the key definitions used within this thesis. Terms that are defined operationally are presented in italics, while similar and other variable names from the literature appear in single inverted commas.

1.5.1 Operational definitions

Variables contained in the hypothesised model have been taken, as much as possible, from the literature. The purpose of this section is to provide operational definitions for these variables.

Empowerment

The term 'empowerment' refers to the giving of power or authority, as well as enabling behaviours. For the purposes of this thesis, however, it is important to distinguish two types of empowerment that exist within the literature, *situational empowerment* and *psychological empowerment*. The two forms of empowerment differ on the basis of the extent to which recipients feel empowered (outcomes) and the formal transference of decision-making power to individual managers (processes). It is necessary to identify *psychological empowerment* as the concept integral to the model tested in this thesis.

Psychological empowerment relates to situations in which power and control are used as motivational and/or expectancy belief states that are internal to individuals (Conger & Kanungo 1988). It is an individual-level variable, developed from the research of Spreitzer (1995a) and defined as follows.

Psychological empowerment is the increased intrinsic task motivation manifested in cognitions that reflect principals' active orientation to their work role.

Situational empowerment

*Situational empowerment*⁶, as referred to in this thesis, is identified as an organisational-level variable (Bacharach & Lawler 1980). Although it is not used extensively in this thesis, the definition is provided to distinguish it from *psychological empowerment*. It is defined as follows.

Situational empowerment is the perceived power that an individual actor or organisational unit has over others and the power that this person or unit holds in relation to others within the organisation.

Psychological empowerment comprises four dimensions, defined as follows.

Competence is the self-belief that principals possess the skills and abilities necessary to perform their tasks as principals well.

⁶ Situational empowerment is also referred to as 'relational' empowerment.

Impact is principals' belief that they have significant influence over strategic, administrative or operational outcomes in their schools.

Meaning is the value of a work goal or purpose, judged in relation to principals' own ideals or standards and is the value they place on their tasks or goals or purpose; it is an investment of emotional significance in an activity or activities.

Self-determination is a principal's sense of having choice in initiating and regulating actions and a feeling of having control over his (her) work.

There are five hypothesised antecedents to *psychological empowerment*. They are defined as follows.

Internal locus of control explains the degree to which principals believe that they, rather than external forces, determine what happens in their lives.

Role clarity is the extent of understanding that principals have over their function within the school.

Self-esteem is a trait reflecting principals' characteristic, affective evaluation of themselves.

Value of strategic information is the value placed on strategic information feedback as a result of the *School Charter/Triennial Review* processes⁷.

Availability of resources is the perception that the resources available are adequate to meet the needs of principals in achieving their aims.

The conceptualisation for *transformational leadership* in this thesis is defined as follows.

Transformational leadership is the ability of principals to stimulate interest among colleagues and followers to view their work from new perspectives, to

⁷ Refer to an explanation definition of the role of the *School Charter/Triennial Review* processes in Section 2.6.

generate awareness of the mission or vision of the team and organisation, to develop colleagues and followers to higher levels of ability and potential and to motivate colleagues and followers to look beyond their own interests toward those that will benefit the group (Bass & Avolio 1994).

Transformational leadership comprises four dimensions, defined as follows.

Charisma is the ability of principals to provide followers with a clear sense of purpose that is energising and is a role model for ethical conduct.

Inspiring subordinates is the ability of principals to display expectations for excellence, quality and high performance on the part of his or her staff members.

Intellectual stimulation is the ability of principals to demonstrate behaviour that challenges staff to re-examine some of the assumptions about their work and rethink how it can be performed.

Strategic vision and articulation is the ability of principals to foster development of vision and goals within their schools.

The two hypothesised antecedents to *transformational leadership* (in addition to *psychological empowerment*) are defined as follows.

Risk profile is the extent to which there is uncertainty about whether potentially significant and/or disappointing outcomes of decisions will be realised.

Need for achievement is the personal striving of individuals to attain goals within their social environment.

Need for achievement comprises two dimensions, defined as follows.

Mastery is the reinforcing properties of problem solving, of tackling the difficult task and succeeding in the face of difficulty.

Pursuit of excellence is competition with a standard of excellence.

The outcome factor of the model is one that attempts to capture the extent to which innovations have taken place within the school with respect to its management structure. While there are many relevant areas for innovation within a school (for example, education

design, curriculum, and welfare), only innovation in management structure is selected for examination. The outcome variable, *innovation in management structure*, is defined as follows.

Innovation in management structure is the extent to which principals have made innovative changes to the management structure of the school.

1.5.2 Definitions relating to research procedures

Throughout this thesis the underlying standard used for terms relating to research procedures, with certain exceptions, are those presented by Emory and Cooper (1991). Nonetheless, certain adaptations have been made to these definitions. The main adaptation is the use of the term 'variable', in place of what Emory and Cooper refer to as a 'construct'. The term 'variable' is preferred in this thesis because of the reliance on structural equation modelling (SEM) for hypothesis testing. The language of SEM refers to 'latent variables' instead of 'latent constructs'. The terms relating to SEM in this thesis are those identified by Hair *et al.* (1998).

1.5.3 Definitions relating to the research setting

The following definitions relate to the environment within which the research was carried out. Detailed descriptions of the research environment are contained in Chapter 2.

Department of Education, Employment and Training is the name of the Victorian State department of education at the time of data collection.

School-based management is a generalised conceptualisation of the devolution of decision-making responsibility and authority is transferred to school principals.

Schools of the Future is the package of educational reforms introduced by the State Government of Victoria in 1993, involving decentralisation of funding from the *Department of Employment, Education and Training* to its constituent school principals. It is a form of school-based management.

A school's *Annual Report* provides the *Department of Education, Employment and Training* with reports on an annual basis. It is one of the major planks of the system of reporting and accountability required under *Schools of the Future*.

A school's *Global Budget* is the funding received by a Victorian state school based on student enrolment numbers used to fund all areas of recurrent expenditure⁸.

The *Triennial Review* is the three-yearly process that integrates a school's *Annual Report* with insights from an external validator. It is the other of the major parts of the system of reporting and accountability required under *Schools of the Future*.

1.6 Limitations of scope and key assumptions

The purpose of this section is to identify the scope of the thesis and to highlight key assumptions underlying the research. Identifying the scope in this way establishes its boundaries. This thesis, as with any other, is subject to constraints of finance and time, without which a much broader scope would be possible. This section contains a presentation of the main limitations of the thesis. Foremost of these is the research question, re-stated here as follows.

Do psychological empowerment and transformational leadership play a significant role in the governance of state schools following decentralisation?

1.6.1 The research setting

Without resource constraints it would be appropriate to investigate the research question in a number of settings in both the private and public sectors operating under a variety of governance structures. Indeed, a more thorough investigation of the question would be possible with the examination of organisations operating in a variety of international settings. However, resource constraints require that the research be carried out in an environment deemed appropriate to the research question.

Thus, it was determined that the research be carried out within the state education sector, testing the hypothesised model within the Victorian State *Department of Education, Employment and Training*. The units of analysis are the principals (managers) of schools

⁸ The only exceptions are capital expenditure and certain categories of expense for system and school support.

within this department. The reason for selection of this setting is that the introduction in 1993 of a decentralisation initiative within *Department of Education, Employment and Training* provided an opportunity to investigate the research question using a population of principals freed from the constraints of line management. Data used to test the hypotheses developed in this thesis were collected from these principals in 2001, some six years after the introduction of *Schools of the Future*.

The Victorian *Department of Education, Employment and Training* was chosen as the setting for the research since its decentralisation process is one of many examples of the devolution of educational decision-making internationally. Other states of Australia have begun the process of devolution of decision-making authority to various degrees, although none began the process as early as Victoria, nor have the principles of decentralisation been implemented as dramatically in other states (Caldwell & Spinks 1998).

A further limitation is the restriction of the population to principals of schools within the *Department of Education, Employment & Training* large enough to warrant the operation of a management system. The most appropriate size criterion for these schools is determined as the entitlement of each to an assistant principal. Smaller schools are not of interest in this thesis since they are assumed not to require systems of governance and management of an appropriate level of complexity. Nonetheless, restricting the sample to large schools amounts to a limitation.

1.6.2 Epistemological stance

Consistent with the literature that forms the foundation for this study, a positivist approach is adopted. This is reflected in both the development of hypotheses and attention to reliability and validity in the study design. Nonetheless, it is recognised that all empirical observations are theory-laden to some extent and reflect, at a minimum, the researcher's epistemological stance. This stance is also consistent with the central themes in the organisational literature that form the foundations of the thesis.

It is essential to acknowledge that the data collected for analysis in this thesis reflect the views and opinions of the respondents and do not represent 'facts' that are independently verifiable. However, to some degree this is the position stated in the later writings of Habermas (1975). It is consistent with his emphasis on internal mental states as the determinants of social laws. This application of realism covers the belief that, not only do direct observables provide evidence of reality, but also that it covers the belief in the

objective existence of empirical relationships which are not directly observable (Ryan, Scapens & Theobald 1992).

At the methodological level, the rationalist/positivist position taken in this thesis argues that it is possible to establish criteria for determining whether the theory summarised in the hypothesised model is justified by the 'facts' as represented by the data collected for statistical analysis. This is the case despite the reliance on the perceptions of the respondents as the determinants of those 'facts'. At the theoretical level, this approach permits the conceptualisation of certain concepts as comprising separate dimensions.

Nonetheless, however, it has been argued that all research is provisional and that no position is unassailable (Ryan et al. 1992). Acknowledgement of this qualification of the research method employed in this thesis is identified as a key scope limitation to this thesis, reflected in the care taken with the reporting of its 'findings'. This study deals with established gaps in the literature, analysing the perceptions of state school principals with regard to their psychological empowerment. It remains for others to fill further gaps in the literature by examining complex issues of the role of *psychological empowerment* and *transformational leadership* in governance from alternative epistemological stances.

1.7 Chapter summary

This chapter contains an introduction to the thesis, as well as an overview. It begins with a statement of the research question, followed by an explanation of the motivation for the thesis, leading to a description of the research method. Next is an outline of the thesis, followed by a section containing operational definitions. Following this is a description of the limitations of scope and key assumptions.

The following chapter, Chapter 2, contains a description of the domain within which the research is carried out and recent reforms experienced within that sector. It contains a description of the issues relating to governance within that environment. Chapter 3, *Literature review and hypothesis development*, marks the beginning of the research.

Chapter 2

Research context

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Chapter 2

Research context

2.1 Introduction

The purpose of this chapter is to describe the setting within which the subjects of the research operate. They are principals of the Victorian State *Department of Education, Employment and Training* and it is necessary to identify recent reforms in state education both internationally and in Australia that have affected their working environment.

This chapter is organised as follows. Section 2.2 contains a discussion of governance, particularly as it applies to public sector organisations. This is followed, in Section 2.3, by a description of public sector reform as evidenced in certain *Organization for Economic Cooperation and Development* (OECD) states, in Australia (at the federal level) and in Victoria (at the state level). Section 2.4 contains a theoretical outline of both traditional systems of education management and school-based management reforms, while Section 2.5 contains descriptions of school-based management reforms in Britain, New Zealand, Hong Kong and the USA. In Section 2.6, the reforms introduced by the Victorian *Schools of the Future* initiative are presented in detail, identifying the environment within which Victorian school principals operate. Section 2.7 contains a description of some of the research conducted into the efficacy of school-based management and the chapter concludes with a summary in Section 2.8.

2.2 Governance

The setting chosen for empirical analysis in this thesis is a large government department in the process of modifying the system of governance of its operational units. According to *OECD Principles of Corporate Governance*, corporate governance (that relating specifically to corporations),

... specifies the distribution of rights and responsibilities among different participants in the corporation and ... spells out the rules and procedures for making decisions on corporate affairs (OECD 1999, p. 3).

A further definition relates more specifically to the governance of public sector organisations as follows.

Governance comprises structures and processes guiding administrative activity that create constraints and controls (both ex ante and ex post) and that confer or allow autonomy on the part of administrative actors ... (Lynn & Heinrich 2000, p. 50).

The debate over the appropriateness of bureaucracies operating in a democracy and the role of public sector managers in democratic processes is one of long standing within the public management research literature. To summarise this debate⁹, one side argues that agency theory best explains the relationships between government and managers and that tightly defined contracts and accountability govern the results for which managers, as agents to politicians and the public they serve, are responsible. Here there is a clear delineation between politics and administration, with policy making the strict venue of politicians and the application of administrative expertise the domain of the public manager. The other side views managers as essential facilitators of democratic processes that appear broken because managers are not elected and therefore unable to articulate and produce essential public policy (Reich 1988, Behn 1998). According to the latter argument, entrepreneurial managers can play a key role in finding community solutions and creating public value that is not possible without some entrepreneurial effort (Borins 2000). In this way it is argued that in the public sector there is a nexus between governance and management. The type of public sector reform described in the following sections appears to suggest a shift from the former view of public governance (and management) policy to the latter.

2.3 Public sector reform

Prior to a discussion of the governance of state schools in Victoria, it is necessary to consider the direction of change within the public sector internationally as well as at the federal level in Australia. This provides an understanding of the general shape of reforms influencing public education systems of states operating within the OECD.

2.3.1 OECD reforms

Public sector reform experienced a gathering of momentum within the OECD throughout the 1980s and 1990s, notable for the magnitude, breadth and significance of the changes (Halligan 2001). In general, there is evidence of a move away from traditional public sector administration models towards a new era of public management reform, characterised by the implementation of what has been referred to as 'new public management' (NPM) (Ferlie *et al.* 1996). These reforms have been aimed at altering the relationship between the public and private sectors of the economy by re-examining the role of the state in the economy and promoting fundamental values such as freedom of the individual, consumer choice and greater initiative for the private sector in economic development (Mascarenhas 1993).

Four reasons have been proposed to explain government questioning of the ability of traditional systems to manage their public services (Halligan 2001). First was the decline in tax revenues for governments during the 1970s, coupled with the inability to reduce service provision to the public. Second, new governments (for example, those in Britain, Canada, New Zealand and Australia) in the late 1970s and early 1980s had similar views on the direction of management change in the public sector. Third, restructuring economies was linked to a mandate to improve public sector management. Fourth, an intellectual climate emerged that was conducive to a reduction in the public sector and an imperative to efficiency. In contrast, the traditional model of the public sector was that it was perceived as rigid and bureaucratic, narrowly focused and preoccupied with process (Hughes 1994). The desired outcomes flowing from these reforms have been described as follows.

[By restructuring] the public sector and its system of financial management governments sought to give public managers greater authority and responsibility and hold them accountable for their results (Mascarenhas 1993, p. 323).

In this process of reorganisation, governments have introduced management techniques and structures for their organisations that are directed towards these ends. Procedures adopted, especially in management and accounting, appear to have been developed from private sector practices, also sometimes referred to as 'new managerialism' (Hood 1990, Zifcak 1997). States involved in these changes reorganised the public services to make

⁹ The summary of this debate is adapted from Feldman and Khademian (2002).

them efficient and more accountable. They appear to have adopted characteristics of the private sector to bring about more market-oriented approaches such as user-pay and contracting and selling of assets (Mascarenhas 1993). Reforms introduced at this time included the *Financial Management Initiative* in Britain and the *Senior Executive Service* in the USA. The Australian government later adopted similar principles in their *Financial Management Improvement Program*, seeking to establish greater political control over the management of departments. An important aspect of this program was direct involvement by governments in the appointment of senior public servants. This resulted in a system of greater accountability since government also held the power of their dismissal. The objective of these reforms was to bring about efficiency in the public sector by giving departmental heads autonomy for managing departments and holding them accountable for performance. These changes appear to be based on economic theories of organisation such as public choice theory and the principal-agent models, where the emphasis is on incentives and performance measurement, coupled with greater emphasis on efficiency and effectiveness (Mascarenhas 1993).

Public choice theory has been defined broadly as the application of the assumptions and methodology of microeconomics to describe or predict the way public officials exercise power (Rossi 1998). The theory provides an examination of public agencies and organisational processes as demonstrations of rational, political preferences connected to constituent expectations (Knott & Miller 1987). It appears to flow from Adam Smith's (1776) notion of consumer sovereignty, suggesting that forces of perfect competition drive the price of the product down to the minimum level consistent with the financial viability of producers. Under this theory, consumers hold the power not to purchase a particular item for consumption if they do not like the product on offer at the given price (Smith 1776). There are reasons for believing that this theory of perfect competition largely explains recent developments in public sector management. Many of the public sector changes in Britain, New Zealand and Australia involve the creation of large numbers of autonomous service provider organisations such as hospitals, local governments and schools. These organisations compete for contracts and funding based on the number of service users (patients in hospitals, ratepayers in local governments and students in schools). Accountability is maintained with reference charters, enabling acts of parliament and purchaser-provider arrangements, providing some level of consumer protection to

counter what could be perceived as a producer-dominated supply of public services (Mayston 1993).

Care is needed when explaining NPM in this way, however, since there is no evidence of increased prices of public sector services located in remote areas. For example, there is no evidence of increased health care or education costs in isolated government-run hospitals or remote schools. Government considerations of equity often prevent this happening. Furthermore, it is not the consumers of public sector services who have been campaigning for the initiation of changes that have taken place. Rather, the initiators of the changes have been central government politicians and their advisors. The interests of these initiators are not necessarily identical to those of either the electorate or public service consumers.

By way of criticism of these reforms, it has been suggested that public sector reforms were not adequately tested prior to their introduction (Mayston 1993). For example, the national application of the *Resource Management Initiative* in the *National Health Service* in Britain followed only six partially completed pilot studies. These failed to produce conclusively successful results (Packwood, Keen & Buxton 1991). In education, before the implementation of the British *Local Management of Schools* initiative in Britain under the *Education Reform Act 1988*, experimental programs involving devolved budgets for school principals had only been implemented in a small number of locations¹⁰.

The political orientation of governments seeking reform (whether they are from the 'left' or from the 'right' of the political spectrum) does not appear to explain its motivation. The move towards a smaller, more efficient, client oriented and market conscious public sector in the USA (under President Reagan) and the UK (under Prime Minister Thatcher) came from conservative governments, whereas similar initiatives in Australia originated with the centre-left Labor governments of Prime Ministers Hawke and Keating (Meek 2001).

2.3.2 Reform in Australia

The seeds of change within Australia appear to have originated with the drive for microeconomic reform introduced by various commonwealth governments since 1973, beginning with the 25% across the board tariff cut by the Whitlam Government. This was

¹⁰ These programs were introduced in the Cambridgeshire and Solihull education districts.

followed, much later, by the deregulation of Australian banks in 1981, the floating of the Australian dollar in 1983, the commitment to general tariff reduction and privatisation in 1986 and the introduction of the *National Competition Policy* in 1995. The Hawke/Keating Labor governments were responsible for all these reforms and they have continued at the federal level following the election of the Howard Coalition Government in 1996. The rationale for microeconomic reform in Australia has been summarised as follows.

Microeconomic reform is about providing incentives for greater productivity. Productivity growth is the key to higher living standards [however] microeconomic reform can also deliver better value, quality and choice to the community (Australian Productivity Commission 1996, p. 11).

The Australian public sector was targeted for restructure as part of the package of the proposals for microeconomic reform. The determination to achieve this was driven by cost-cutting criteria, although this motivation was intensified by the balance of payments crisis experienced by the Australian economy in 1986¹¹.

Reform began with the publication of the Royal Commission on Australian Government Administration (Coombs report 1976). Among other things, this commission identified the following requirements.

- *To establish effective means of accountability for public officials;*
- *to respond to the increasing demands of the community;*
- *to participate in government decision making;*
- *to strengthen the managerial role of officials in recognition of the expanding role of government as a provider of services; and*
- *to reduce excessive centralisation and hierarchy and to devolve and decentralise responsibility to the point of contact with the citizen* (Coombs report 1976, p. 8).

Three White Papers published by federal governments since then were *Reforming the Australian Public Service* (Commonwealth Government 1983), *Budget Reform* (Commonwealth Government 1984) and *Statutory Authorities and Government Business Enterprises* (Commonwealth Government 1986). Together, these documents represented

the platform upon which the reforms of the public sector in the following decades were based. The first of these, *Reforming the Australian Public Service*, contained three main objectives. First was to provide a workable formula to give substance to the Westminster traditions of ministerial responsibility and accountability. Second was a means to restore confidence in the quality of Commonwealth public administration, both at the ministerial and public service levels. Third was the need to build a dynamic, equitable and flexible structure that was capable of responding efficiently and effectively to the new government's programs and the increasing complexities of the modern democratic state (McInnes 1990). These proposals for reform were legislated through the *Public Service Reform Act* 1984, described as,

... the most wide-ranging reforms of the Australian public service since its creation at the time of federation (Wilenski 1986, p. 271).

The changes began a shift away from bureaucratic assumptions and service ideals towards generic management (Laffin 1996) and this trend was intensified with the administrative changes of 1986 and 1987, designed to force the public service to become more efficient by reducing outlays and staff numbers (McInnes 1990).

Within the public sector a 'universal orthodoxy' underlies the reasons for change. Three aims have been identified as follows. First is the need to cut back expenditure linked with the perception that rising taxes are regarded as unacceptable to the electorate. Second is the belief that high levels of government expenditure and government employment are intrinsically economically harmful and must be reduced. Third is scepticism about the efficiency of government services linked with greater demands for service value for taxation dollars (Weller 1996). The objectives of these reforms were focused on the following.

- *Increased attention to results, including cost-effectiveness, service quality and program outcomes;*
- *enhanced delegation and devolution of authority, combined with strengthened accountability; and*
- *streamlined and simplified administrative systems, encompassing efficiency measures, increased flexibility and a more commercial approach to the management of resources* (Office of the auditor general of Canada 1997, p. 18).

A more recent report produced by the *Australia Productivity Commission* includes recommendations that should apply 'as broadly as possible in the public sector' (Australian

¹¹ This crisis was the progenitor for the famous description of the Australian economy by the Treasurer, Mr Paul Keating, as a 'Banana Republic'.

Productivity Commission 1996). Included in this report were proposals for financial management reforms, commercialisation of functions, purchaser provider arrangements and competitive tendering and contracting and monitoring of outcomes.

2.3.3 Reform in Victoria

A similar pattern of reform is also found at the state level. Following many years of governance by the Labor Party in the late 1980s, the State of Victoria, Australia found itself in a difficult situation on a number of fronts. This was characterised by high levels of individual debt, high interest rates, high rates of unemployment and high levels of inflation. The newly elected Premier of Victoria in 1992, Jeff Kennett, summarised the situation and his solutions as follows.

Victoria headed into the last stretch of the 20th century handicapped with debt, an overburdened public sector and a sluggish, inefficient economy, and carrying [many] under-utilized assets. The Coalition Parties were elected in October 1992, with an overwhelming expectation that the new government would be an agent for change and that its task would be to undertake a major corporate restructuring of the State. The solution was a comprehensive package of reforms spread across the public and private sectors. Essentially, the government set about to mould a community spirit that would impel Victoria's quest for efficiency, productivity, innovation and quality, as well as for new global investment, joint venture and trade opportunities, against the benchmark of international best practice. Victoria has a strong pro-business government along with a proactive industry policy. Its future as a centre of business activity looks much brighter in 1994 than it did a year earlier (Kennett 1994, p. 15).

Victoria's new centre-right government of 1992 had a reform agenda based around five 'principles' (beliefs) with respect to the public sector. These principles were,

- a preference for market mechanisms in the provision of public services;
- a focus on clear accountability for results for public agencies;
- the empowering of the consumers of public services;
- the minimising of government bureaucracy for consumers; and

- a professional and business-like management of public agencies (Pascoe & Pascoe 1998, p. ix)¹².

In an example of the type of public sector reform introduced by the Kennett Government, the Victorian *Public Sector Management Act 1992* reduced the number of government departments from 22 to 13, put all senior public servants on contract and gave the Premier direct authority over the public service as the formal employer of public service department heads. Changes were made to a wide range of government instrumentalities including health (with the introduction of a formula for health funding based on the incidents of care provided), the tendering out of the control systems for emergency services and the privatisation of utilities and the transport system. Education, funded in Australia at the state level following a distribution of funds from the Federal Government, underwent changes of a similar scale. Details of public education reform and a description of *Schools of the Future* are contained in Section 2.6. Prior to that discussion, however, it is useful to consider the reforms that have taken place in public education on a broader perspective.

2.4 Public education reform

This section contains a discussion of reform that has taken place within public sector education systems within the OECD. It begins with a description of traditional systems of state education and is followed by a description of school-based management (SBM).

2.4.1 Traditional systems

Traditional school management is characterised by tight external control from the corporate centre, where school management tasks take place under instruction from a central office of the school system, most often a department of education. Often this is not in accordance with individual school characteristics and needs and school members do not have decision-making autonomy (Cheng 1996). Thus, traditional government school departments of education are characterised by centralisation and standard structures. The traditional system is summarised as follows.

Few decisions could be made at the school level. Teachers were assigned to schools by formula. There was no selection of principals or teachers at the

¹² Pascoe & Pascoe (1998) quote these principles and goals from a mimeo supplied by the Victorian Department of Treasury and Finance entitled *Management Improvement Initiative for Victoria* (1993).

local level. All non-staffing resources were allocated by formula whether the school needed them or not. Curriculum was centrally-determined and there was a regime of inspection. There was little involvement of the community in local decision-making. No funds of any kind were decentralised from system to school and any cash at the school level was raised locally by voluntary effort. ... The principal made few decisions of substance. Markets were virtually non-existent in public schools (Caldwell 1998b, p.3).

They are implementing systems and they exhibit tight structural control on constituent schools. Consequently, school management tasks are,

... performed under instruction of the external central authority, often not in accordance with school characteristics and need, and school members do not have much autonomy and commitment (Cheng 1996, p. 44).

The following characteristics applying to traditional systems of education are taken from Cheng (1996, pp. 50-58).

Centralisation

Centralised school systems allow little scope for schools to make decisions without consultation with the central authority. Centralisation is consistent with the principle of standard structure. As educational tasks become more complicated and changeable, this management style tends to become more ineffective as individual schools constantly refer to the central authority for approval at every decision-making point.

Assumptions about education

Under traditional systems of education, goals are assumed to be simple and unified and the educational environment is seen as nearly static. As a result there is no need to conduct any educational reforms to adapt to the environment. The management tends to emphasise standardisation and stability. Schools under traditional systems pursue educational quantity.

Principle of standard structure (vs. equifinality)

Traditional management of school systems emphasises the function of organisational structure and standard methods and procedures to achieve management goals. It is assumed that these procedures suit all schools. Thus, all that is required of the outside (central) body is to conduct audits into the extent to which standard structures have

operated within the school. These ideas are based on classical theories of management such as the scientific management approaches of Taylor (1947), Urwick (1947), and Weber's (1947) theory of bureaucracy.

Principle of implementing system (vs. self-management system)

Within an education system operating in the traditional manner, schools are regarded as the tool used to achieve educational policy goals or as a passive implementing system that requires vigilant external control. Under such systems, schools receive orders from the central authority passively. No initiative power or accountability is explicitly assigned to them.

Principle of structural control (vs. human initiative)

Under traditional education systems the structural factors of organisation may be emphasised. In this situation, an ideal organisational structure or a precise system may be designed to make people work effectively. If a problem arises, it is assumed that there is something wrong with the structure or with the external control (Bolman & Deal 1991). Thus, in traditional systems, there is a pressure to enforce supervision on schools and increase regulations for controlling them. The result is the expansion of the bureaucratic system of the central authority. In response to any ineffectiveness and dependence of schools, the central authority needs to inject more resources on supervision and control in order to enhance education quality.

2.4.2 School-Based Management

School-based management (SBM)¹³ has been described as,

A form of decentralisation that identifies the individual school as the primary unit of improvement and relies on the redistribution of decision-making authority as the primary means through which improvements might be stimulated and sustained (Malen, Ogawa & Kranz 1990, p. 295).

¹³ 'School-based management' is also referred to, among other things, as 'site-based management' and 'school-site management'. Schools that adopt SBM are often described as 'self-managing' and in Australia the term 'devolution' is commonly used. For consistency, the term 'SBM' is used throughout this thesis to describe this system.

Schools that operate within an SBM framework are referred to as 'self-managing'. A definition of a self-managing school is provided as follows.

A self-managing school is a school in a system of education to which there has been decentralized a significant amount of authority and responsibility to make decisions related to the allocation of resources within a centrally determined framework of goals, policies, standards and accountabilities. Resources are defined broadly to include knowledge, technology, power, material, people, time, assessment, information and finance (Caldwell & Spinks 1998, pp. 4-5).

A self-managing school is neither a self-governing school nor an autonomous school, since these types of schools have a degree of independence that is not provided in a centrally determined framework (Caldwell & Spinks 1998). The concept of self-managing relates to schools contained within a system, such as public (government) schools or those that are part of some systems of Catholic schools. The model for the organisational structure for the delivery of primary and secondary education widely embraced since the early 1980s is that the preferred governance structure is a larger number of smaller units. This is the view of the public choice theorists¹⁴ who make the assumption that although people acting in the political marketplace have some concern for others, their main motive, whether they are voters, politicians, lobbyists, or bureaucrats, is self-interest. The rationale behind SBM is that those who are closest to the primary business of schools will make the best-informed decisions and the essential purpose of redistributing decision-making authority to increase the autonomy of the critical stakeholders is to improve the instructional process (Summers & Johnson 1996). A discussion of the characteristics of SBM education systems follows. As with the characteristics of traditional systems outlined in Section 2.4.1, they are taken from (Cheng 1996, pp. 42-48).

Decentralisation

Under decentralised systems of school management at the macro (government department) level, schools are given the power and responsibility to solve problems effectively where the problems arise; that is, within schools. It aims at efficiency and problem solving and does not allow problems to be avoided. Schools operating under a decentralised system

¹⁴ Public choice theory is discussed in Section 2.3.1.

have the capacity to identify problems, to solve them in a timely fashion and make a greater contribution to the effectiveness of teaching and learning activities.

Assumptions about education

Educational goals under SBM are assumed to be multiple, based on the expectations of multiple-school constituencies. The educational environment is believed to be complex and changing. As a result, educational reforms in school are inevitable and needed to adapt to the changing environment, to enhance effectiveness and to achieve educational goals. Schools under SBM tend to pursue educational quality.

Principle of equifinality (vs. standard structure)

The principle of equifinality is the antithesis of standard structure and is based on the theory that there are many ways to achieve goals (Hackman & Walton 1986, Katz & Kahn 1978). With systems of equifinality, emphasis is on flexibility. Internal school systems should be used to manage schools, each according to their own peculiar conditions. The principle of equifinality emphasises the need for the decentralisation of power to enable schools to develop and identify their own unique strategies to achieve effective management.

Principle of self-management system (vs. implementing system)

Under SBM, schools are required to achieve policy goals. However (in line with the principle of equifinality) it is recognised that there are many ways to achieve these goals. Therefore it is necessary to allow school managers to develop self-managing systems operating under some overall policies and structures. However, such schools should possess considerable autonomy to develop management strategies and teaching objectives that facilitate the distribution of human resources, to solve problems and to accomplish objectives in ways that are appropriate for the environment within which each school operates. Since the schools are self-managing, school communities are more likely to take the initiative for their own responsibility.

Principle of human initiative (vs. structural control)

The human resource perspective of management (in contrast to the emphasis on structural control) emphasises that people are valuable resources of an organisation. Therefore, the main aim of management is to develop the human resources within a school to give play to initiative (Bolman & Deal 1991). SBM supporters recognise this point of view and argue

that suitable environments need to be constructed within schools so that members are able to participate widely and to develop their potential. Under these systems, improvements in education quality come from the improvement of internal processes, in particular those that arise from human characteristics.

Table 2-1 SBM theory vs. external management theory

	School-based management	External control management
Assumptions about education	<ul style="list-style-type: none"> • Multiplicity of educational goals • Complex and changing educational environment • Need for educational reforms • Effectiveness and adaptation oriented • Pursuit of quality 	<ul style="list-style-type: none"> • Unification of educational goals • Simple and nearly static educational environment • No need for educational reforms • Standardization and stability oriented • Pursuit of quantity
Theories used to manage schools	<p><i>Principle of equifinality:</i></p> <ul style="list-style-type: none"> • Many different ways to achieve goals • Emphasizes flexibility <p><i>Principle of decentralization:</i></p> <ul style="list-style-type: none"> • Problems are inevitable, should be solved at where they happen in time • Looks for efficiency and problem-solving <p><i>Principle of self-managing system:</i></p> <ul style="list-style-type: none"> • Self-managing • Actively exploitative • Responsible <p><i>Principle of human initiative:</i></p> <ul style="list-style-type: none"> • Develops internal human resources • Wide participation of school members 	<p><i>Principle of standard structure:</i></p> <ul style="list-style-type: none"> • Standard methods and procedures to achieve goals • Emphasizes generalisability <p><i>Principle of centralisation:</i></p> <ul style="list-style-type: none"> • Things big or small are carefully controlled to avoid problems • Pursues procedural control <p><i>Principle of implementing system:</i></p> <ul style="list-style-type: none"> • Externally controlled • Passively receptive • Not accountable <p><i>Principle of structural control:</i></p> <ul style="list-style-type: none"> • Enforces external supervision • Expansion of bureaucratic system

Adapted from (Cheng 1993, p. i)

Thus, a fundamental characteristic of current reforms in public education is the dismantling of large administrative centres and devolution of responsibility, decision-making and accountability to the principals of schools. The impetus of these changes can be identified from public sector reforms identified in earlier sections of this chapter. Differences in assumptions about education and management between traditional management of schools and SBM have been synthesised (Cheng 1996) and a summary of the key differences between traditional and an SBM system of education can be observed in Table 2-1. Inspection of this table reveals that there are significant differences between the old and

new systems in terms of assumptions and operational theories of management and education. Of particular interest are the theories used to describe the management of schools.

A meta-analysis by Summers and Johnson (1996) of various SBM systems developed internationally identified the following common elements in the delegation of authority to schools.

The nature of this increased authority is defined by three elements: the areas of decision making to which the increased authority applies, the constraints limiting exercise of that authority, and the collection of individuals who receive the new authority (Summers & Johnson 1996, p. 77).

To emphasise the importance of SBM, consideration is given to three 'tracks' that are believed to lead to the creation of 'world-class' schools (Caldwell & Spinks 1998)¹⁵. Of these, Track 1 is identified as the most relevant for this thesis. It involves the building of schools where more authority and responsibility are decentralised to the local level within a framework of centrally determined goals, priorities, frameworks, standards and accountabilities. It focuses on the managerial restructure of public education systems and is the initiative that provides relational empowerment for school principals. There is a belief that some Australian states, especially Victoria, are achieving world-class status along this track (Caldwell 2000). SBM frees schools from externally imposed sets of rules and allows them to become more dynamic. In this way they become more responsive to their constituents and the environment in which they operate.

2.5 International public education reforms

This section contains a description of reforms that have taken place within a number of OECD states, providing an understanding of the extent of adoption of SBM internationally. This, in turn, provides some understanding of the similarities and differences compared with the Victorian State system. Various titles have been assigned to SBM reforms in states adopting this system. They include *Local Management of Schools* in Britain, *Tomorrow's Schools* in New Zealand, the *School Management Initiative* in Hong Kong

¹⁵ The other two tracks focus on learning outcomes for students (Track 2) and creation of schools for the knowledge society (Track 3). Neither of these is directly relevant to the research in this thesis.

and reforms evident in the USA with the development of *Charter Schools*. Each is described in brief in the following sub-sections. *Schools of the Future*, the system of SBM introduced into Victoria, Australia, is described in more detail in the following section.

2.5.1 Britain (Local Management of Schools)

The public school system within Britain was one of the first to adopt SBM practices. The *Education Reform Act 1988* provided for the system known as *Local Management of Schools* (first known as 'local financial management'). A key feature of this act was the provision for schools to opt out of control by their local education authorities and become 'grant-maintained'. This allowed schools to secure additional resources which are equivalent to the value of services previously provided by the authority and both ownership of the schools and the contracts with teachers within them passed from the local authority to the governing body of the school (Caldwell & Spinks 1998). The reforms allow government schools to opt out of highly regulated local authority control and operate as autonomous schools funded directly by the central government (Gannicott 1997).

This scheme represented a move towards self-governance since their ownership had passed to a board of governors, although it was argued that this move represented merely a shift along the spectrum of self-management since grant maintained schools still operated with nationally determined curriculum, testing, inspection, accountability, funding and listing on the national 'league tables' (Caldwell & Spinks 1998). Following its election in 1997, the Labour Government returned grant maintained schools to control by local authorities. However, most opted for the status of the 'foundation' classification of schools, thereby retaining a higher degree of autonomy than 'community' schools owned by the local authority. Other characteristics of *Local Management of Schools* are as follows.

- Schools operate within a centrally determined framework including a national curriculum, prepared in the 1990s and under constant revision since that time;
- Under the new system of administration, labels were attached to schools, ranging from 'successful' and 'improving', to 'cause for concern' and 'failing';
- Public examination results for secondary students were published nationally in 'league tables' and placed in rank order;
- Parents take a school's ranking into consideration when considering choices about schools; and

- Under the Office for Standards in Education, independent teams inspect schools rigorously at least once every four years. This encompasses the performance of principals and teachers.

2.5.2 New Zealand (Tomorrow's Schools)

The *Ministry of Education* replaced the *Department of Education* in New Zealand in 1989, leading to changes at the department level that involved an overall reduction in staff numbers. The role of the new ministry was primarily that of providing policy advice to the New Zealand government, a move away from the total administration of education.

The SBM initiative, named *Tomorrow's Schools*, has the following features. A locally elected board of trustees replaced the centralised bureaucracy and schools received financial independence. The roles of school boards and committees were strengthened. Local governance became a cornerstone of the new system and schools, their principals and their communities were granted the power to make decisions and to operate in the most effective ways for the good of their students. The role of the principal became to provide leadership and management, not merely administration. A major change relating to staffing arrangements was that Boards of Trustees employ principals and teachers and they are not employees of the Ministry of Education¹⁶. Parents are now free to choose which school their children attend. This replaced the system of 'zoning' whereby students were required to attend a particular local school.

Commenting on the reforms to the New Zealand education system, the president of the *Secondary Principals Association of New Zealand* made the following statement.

The Tomorrow's Schools reforms provided the environment for principals to become educational leaders. It provided the environment in which we could take risks and try different things. Of course, it also provided an environment in which total responsibility was expected of us, and this inevitably left us with nowhere to hide if we got it wrong (Wylie 1994, p. 65).

This highlights the accountability and scope of management control available to principals under the new system.

¹⁶ These reforms stopped short of what occurred in Britain and Victoria in respect to budgeting for staff, with only a small number of schools budgeting for staff with full flexibility (Caldwell & Spinks 1998, p. 8).

2.5.3 Hong Kong (School Management Initiative)

The move towards SBM began in Hong Kong in the early 1990s. In Hong Kong only 8% of its 1,200 schools are government schools. The remaining schools fall into what is referred to as the 'aided sector' and are owned by a range of foundations, trusts, churches and private organisations, all of which receive a great amount of government funding. Under the *School Management Initiative* a large proportion of government grants was decentralised to the school level for local decision-making. This came with the requirement that school communities and their teachers should become more involved with decision-making and accountability mechanisms. By 1998 just over 200 schools had volunteered to join the scheme (Caldwell & Spinks 1998). The *School Management Initiative* called for schools to volunteer their participation in an approach involving higher levels of local participation in decision-making, more resource flexibility a deeper planning capacity and more accountability (Caldwell & Hayward 1998).

2.5.4 USA (Charter Schools)

SBM began in the USA in 1986 when the *National Education Association* and the *National Association of Secondary School Principals* proposed the idea (Cheng 1993). By 1996 the move to SBM was widespread, as suggested by the following,

Virtually every school district in the United States is actively reviewing the concept of increasing the decision-making autonomy of individual schools – developing school-based management (SBM) plans (Summers & Johnson 1996, p. 75).

A feature of the system for many states of the USA is that it allows groups or individuals to establish charter schools that exist outside the existing school system, a characteristic that is not common to state school reforms in other countries. Schools that adopt these changes are referred to as *Charter Schools*. While these schools are publicly funded and publicly owned, *Charter Schools* are self-governing according to a performance contract agreed to between government and whichever body establishes the school. Sponsoring organisations can include universities, charitable organisations and private corporations. The contract defines what the school's goals and objectives will be and imposes a strong accountability system to ensure that they are met. Within broad guidelines used to establish and accredit charter schools there is flexibility for each school to decide how it will be managed, including hiring staff and setting pay and work conditions, and what will be taught. In this

way, each school is responsive to its community and able to offer a unique educational experience directed at the needs of its students. It has been argued that charter schools break down the power and influence of self interested groups and put control in the hands of parents who can send their children to the school that best meets their needs (Gannicott 1997).

2.6 SBM in Victoria (*Schools of the Future*)

This section contains a description of the reforms that had taken place in state education in Victoria up to the time of data collection (2001). Presenting these reforms provides an understanding of the environment within which the state school principals operated at that time. Victorian state school principals are the units of analysis for the research carried out in this thesis.

Prior to 1992 the Victorian department of education possessed all the features of the traditional system of public education. It comprised a large and powerful centralised bureaucracy that handled schools' financial administration and allocated staff to schools. Support services such as visiting teachers for disabled students and psychology services for students who needed guidance were provided on a regional basis. There were minimal requirements for accountability to the central government. An accompanying phenomenon in this system was the occurrence of severe budgetary overruns (Pascoe & Pascoe 1998)¹⁷.

In school education the reform assumptions of the Kennett Government elected in 1992 (detailed in Section 2.3.2) led to a reform that was both systemic and structural. Changes were introduced under Minister Doug Hayward, who held the education portfolio. They included the following.

- Government schools were offered SBM;
- Schools and principals were made accountable;
- Parents were given increased access to local decision-making and better knowledge about their children's academic attainment;
- The central bureaucracy was reduced in size and authority; and
- School councils and principals were given increased power 'inside the school fence'.

¹⁷ These overruns often absorbed between 10 and 30 percent of the Treasurer's discretionary fund (Richards 1992).

These changes were introduced into the Victorian *Department of Education, Employment and Training*¹⁸ initially under the designation *Schools of the Future*. Under this system schools were designated 'self-managing' and responsibility for decision-making was devolved from the *Department of Education, Employment and Training* to the principals of individual schools.

Education Minister Hayward identified the objectives and purposes of the *Schools of the Future* program as follows. They were,

- to encourage the continuing improvement in the quality of educational programs and practices in Victorian schools to enhance student learning outcomes;
- to actively foster the attributes of good schools in terms of leadership, school ethos, goals, planning and accountability process;
- to build on a state-wide framework of quality curriculum, programs and practices;
- to encourage parents to participate directly in decisions that affect their child's education;
- to recognize teachers as true professionals, able to determine their own careers and with the freedom to exercise their professional skills and judgements in the classroom;
- to allow principals to become true leaders in their school with the ability to build and lead their teaching teams;
- to enable communities, through the school charter, to determine the destiny of the school, its character and ethos;
- to, within guidelines, enable schools to develop their own programs to meet the individual needs of students; and
- to be accountable to the community for the progress of the school and the achievements of its students (Caldwell & Spinks 1998, pp. 48-49).

There are four elements in the *Schools of the Future* framework¹⁹. They are the *Resources Framework*, the *Accountability Framework*, the *Curriculum Framework* and the *People Framework*. They are described as follows.

¹⁸ This was the name of the Victorian department of education at the time that data were collected for empirical analysis.

¹⁹ This framework is taken from the summary of *Schools of the Future* contained in Pascoe & Pascoe (1998).

Resources framework

This framework allocates 90% of the school's recurrent budget to the school via the *School Global Budget*²⁰. This budget is calculated on a student *per capita* basis and allows schools to allocate all resources in accordance with local need. The aim of the resources framework is to allow principals and school councils to set and allocate resources for local priorities, to separate the purchase of education from its provision and to decrease the need for central bureaucracy.

Accountability framework

There are three elements to the accountability framework. They are the *School Charter*, an *Annual Report* and a *Triennial Review*. The *School Charter* is developed by the school council and is a contract between the school and the government regarding 'the learning that will take place and the way it will be monitored and reported to the government. Each school is then required to report annually to government and to undergo a more comprehensive review of its operations every three years. The accountability framework gives parents, via the *School Council*, a greater level of involvement in the conduct of the school and increases the requirement to account for the enterprise of the school to the government. The *Office of Review* within the *Department of Education, Employment and Training* has the power to require that school charters be re-written and to require that the objectives not attained in one year be carried over to the next.

Curriculum and standards framework

The *Curriculum and Standards Framework* (CSF) contains eight key learning areas for students in years P (the first year of schooling for students) to Year 10, incorporating content and process standards. Student progress is assessed against the CSF in a program of state-wide assessment known as the *Learning Assessment Project*. The *Learning Assessment Project* results represent another instrument of accountability (in addition to the *School Charter*), providing parents and schools with feedback on the performance of their children compared with other schools. The *Victorian Certificate of Education* encompasses Years 11 and 12 and was revised and reaccredited with the introduction of *Schools of the Future*. These frameworks are determined by the *Board of Studies*.

²⁰ Prior to the introduction of the *Schools of the Future*, only around 6% of state funds were decentralised to schools (Caldwell & Spinks).

People framework

Staff selection has been devolved to the local level and professional development was provided to build capacity in principals for their expanded roles, as well as to skill teachers to implement the curriculum improvements. Local staff selection, appraisal and professional development gave the schools greater control over their human resources and greater flexibility in responding to local needs. Local staff appraisal feeds into improvement and provides the basis for promotions based on merit rather than seniority.

2.7 School-based management research

Although it is not the aim of this thesis to investigate the effectiveness of SBM, it is useful at this point to identify the extent to which SBM initiatives have achieved stated aims. The purpose of this section, therefore, is to summarise the literature relating to the success of SBM in achieving its aims.

The motivating force behind the introduction of SBM is the improvement of learning outcomes. This belief is summarised as follows.

[W]hile factors underpinning the movement to self-managing schools are many and varied, there has always been an expectation that they will make a contribution to improved outcomes for students (Caldwell 1998a, p. 38).

Thus there is much interest in whether schools that are more autonomous produce better outcomes in terms of student performance and educational outcomes than schools subject to tighter bureaucratic controls. It is a critical issue in determining the effectiveness of SBM reforms.

However, despite widespread advocacy for increasing SBM, and the fact that SBM has been adopted in many locations internationally, research into its effects on student performance is sparse (Caldwell & Spinks 1998, Gannicott 1998). The paucity of valid empirical evidence available suggests that this reform is not likely, on its own, to lead to higher levels of student achievement (Hannaway 1996)²¹.

²¹ Hannaway (1996) suggests, however, that decentralisation in tandem with other reforms, such as performance-based incentives, may produce significant benefits.

2.7.1 Research into school governance

A research issue involves the measurement of the outcomes of education initiatives, especially those relating to governance. This is problematical since in education there are many factors that affect a school's performance and it is difficult to control for these so that the effects of increased levels of autonomy can be observed in isolation. To illustrate, it would appear at first glance that the distinction that is made between 'public' and 'private' schools would offer a suitable means of distinguishing more autonomous from less autonomous schools. Care must be taken, however, since many 'private' schools receive public money. For example, church-operated schools in Victoria receive a large proportion of funding from government and are subject to curriculum and other controls that act to limit the extent of their autonomy. In addition, Catholic schools are subject to bureaucratic control by centralised agencies in much the same way as state schools under bureaucratic systems. As a result, it is not possible to test the effects of SBM using the public/private school dichotomy in Australia.

2.7.2 Research into 'public' vs. 'private' schools

In addition to the previous point regarding 'private' and 'public' schools, research has revealed a consistent pattern of the academic superiority of autonomous or private schools over public schools (Gannicott 1998). The 'Catholic Studies' (Greely, McCready & McCourt 1976) provide a consistent body of evidence on the academic superiority of private schools and it was noted that academic success is a product, among other things, of effective school organisation. The conclusion of the Chubb and Moe (1990) studies was that autonomy has the strongest influence on impact upon learning outcomes of any factor examined (Chubb & Moe 1990). A further study involved research into the effects of a voucher system whereby parents could send their children to any school, public or private (Greene, Peterson & Du 1996). Here it was found that, although there were no differences in the first two years of school, there were significant improvements in learning outcomes in years three and four.

Overall, however, results of superior performance of private schools cannot be attributed solely to school autonomy. Selection bias (the term for distinguishing school effects and student effects) could be an important variable in producing many of these results. That is, independent schools may produce better results because they attract better quality students (Gannicott 1998). In fact, there appears to be no study establishing a direct link between increased autonomy and improved learning outcomes.

2.7.3 Research into Schools of the Future

Schools of the Future, characterising the type of devolution outlined in this chapter, has been in place since the phase-in period of between 1993 and 1996. As has been identified by Caldwell and Spinks (1998), the purpose of the program is to include, amongst other things, improved learning outcomes in terms of curriculum and learning benefits. An explanatory model developed in 1998, however, confirmed earlier research conclusions that decentralisation of decision-making does not, of and in itself, result in improved learning for students (Cooperative research project 1998). The model developed in that project was based on the perceptions of school principals as they pertain to organisational-level factors in an attempt to link them to curriculum and learning benefits. Testing a structural equation model developed to link organisational factors²² with learning outcomes suggested that the decentralisation of decision-making in planning and resource allocation does not, of and in itself, result in improved learning for students. It does suggest, however, that,

... if the linkages are made in an appropriate way, then an indirect effect is realized through action in the personnel and professional domain and also confidence in the efficacy of the reform (Caldwell & Spinks 1998, p. 51).

However, to date, there is no empirical support for the contention that improved learning outcomes arise directly from changes in organisational-level factors. The aim of this thesis is to investigate the existence of certain desirable outcomes of the *situational empowerment* (introduced to schools via SBM) leading to increases in the *psychological empowerment* of school principals. Even though the research falls short of addressing the critical question of attributing the influence of SBM directly to improving learning outcomes, it is an attempt to gain an understanding of the transfer of decision-making power and accountability to school principals.

Thus, despite the clear statement of the purpose of the devolutionary process in the improvement of learning outcomes as a result of SBM, Caldwell & Spinks (1998) acknowledge that the empirical evidence to support this aim is sparse. They make the following admission,

²² Included amongst these organisational factors were school and community benefits, planning and resource allocation benefits, curriculum support, personnel and professional benefits.

There is ... no doubt that evidence of a direct cause-and-effect relationship between self-management and improved outcomes is minimal (p. 66).

Caldwell & Hayward (1998) also state, however, that SBM will not bring about improvements in student learning on their own, as follows.

The structural features of such reforms such as the shift of authority, responsibility and accountability to the school level are unlikely, by themselves, to have either a direct or indirect effect on curriculum and learning unless the capacities that may be nurtured within such arrangements are developed (p. 110).

The following statement further supports this view.

The transformation of teaching practice is fundamentally a problem of enhancing individual knowledge and skill, not a problem of organizational structure; getting the structure right depends on first understanding that problem of knowledge and skill (Elmore, Peterson & McCarthy 1996, p. 237).

Despite the paucity of direct evidence of the hoped for links, however, Caldwell (1998a, p. 1) believes that,

... there is more promising evidence of indirect links and contingencies that account for improved student outcomes under conditions of autonomy.

2.8 Chapter summary

The purpose of this chapter is to identify the trends in public sector reforms, especially as they operate within public education systems and to provide an understanding of the environment within which the research in this thesis is conducted. The chapter begins with a general discussion of governance and management, leading into a discussion of public sector reform both internationally and within Australia. Next, a description of reforms in public education is presented, followed by a description of changes that have been made in Britain, New Zealand, Hong Kong and the USA. Then follows a description of reform in public schools the state of Victoria, Australia. Finally, a brief summary of SBM research is presented.

The next chapter, Chapter 3, contains a discussion of the theoretical underpinnings of the thesis, identifying research issues, explaining the research motivation and developing a set of hypotheses for testing. This is centred on the development of a model that describes the roles played by *psychological empowerment* and *transformational leadership* in the governance of state schools following the introduction of the reforms described in this chapter. Chapter 3 marks the beginning of the research.

Chapter 3

Literature review and hypothesis development

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Chapter 3

Literature review and hypothesis development

3.1 Introduction

The purpose of this chapter is to identify the research issues of the thesis, to explain the research motivation and to develop a set of hypotheses for testing. The thesis is, primarily, a study of *psychological empowerment* and *transformational leadership* and the role they play in the governance of state schools.

The outcome of the literature review in this chapter is a set of propositions, contained in a model linking *psychological empowerment* (and various antecedents), through *transformational leadership* to *innovation in management structure* and improved management effectiveness²³. In particular, the purpose of this chapter is to identify support for the following.

1. The hypothesised dimensions of *psychological empowerment* and *transformational leadership*;
2. four antecedents of *psychological empowerment*;
3. the link between *psychological empowerment* (along with two other factors, *risk profile* and *need for achievement*) and *transformational leadership*; and
4. the link between *transformational leadership* and *innovation in management structure*.

The previous chapter, Chapter 2, contains a description of the environment within which the research population, principals of large Victorian state schools, operates. The following chapter, Chapter 4, contains a description of the design of this research.

The remainder of this chapter is as follows. Section 3.2 contains a discussion of the nature of empowerment, distinguishing *situational empowerment* from *psychological empowerment* and Section 3.3 contains a description of the research model. The next two sections (Sections 3.4 and 3.5) contain outlines of, first, the hypothesised dimensions and, second, antecedents of *psychological empowerment*. Sections 3.6 and 3.7, respectively, contain outlines of the hypothesised dimensions and antecedents of *transformational*

²³ Although the model identifies improved management effectiveness as an outcome of *innovation in management structure*, this link is not tested empirically.

leadership. Section 3.8 contains a description of the relationship between *transformational leadership* and *innovation in management structure*, while in Section 3.9 the implications for organisational effectiveness are presented. This chapter concludes with a summary in Section 3.10.

3.2 Empowerment

In general, 'empowerment' refers to the giving of power or authority and enabling behaviours. The verb 'to empower' implies the granting of power or delegation of authority (Burke 1986). The 'empowerment' concept is evident within the broad spectrum of social science literature and there is a widespread use of the variable in researching issues of powerlessness within minority groups. It has been used for research into native populations (Chambers 2002-2003), women (Coomaraswamy 2002), and disabled persons (Akey 2000). There are many meanings for this concept, each relating to a particular area of research interest. In general, this study investigates empowerment as it operates in the workplace; in particular, its focus is on its relevance for issues of management.

At this point it is important to distinguish two types of empowerment that exist within the management literature. They are *situational* (or 'relational') *empowerment* and *psychological* (or 'felt') *empowerment*. The more relevant concept for this thesis is *psychological empowerment*.

In essence, the two forms of empowerment differ on the basis of the process of, on the one hand, formally transferring decision-making power to individual managers (*situational empowerment*) and, on the other hand, the extent to which recipients feel empowered (*psychological empowerment*). In order to distinguish these concepts more clearly, the following two sub-sections contain their descriptions.

Situational empowerment

Situational power refers to the perceived power that an individual actor or organisational unit has over others and the power that this person or unit holds in relation to others within the organisation (Bacharach & Lawler 1980). Taken from social exchange theory, power in this context is interpreted as a function of the dependence and interdependence of actors and arises in respect to the relative power one actor has over another (Blau 1964, Homans 1974, Pfeffer 1981). At the organisational level, the sources of an actor's power over the organisation are that person's ability either to provide a valued resource or to cope with the

organisation's problems as they arise (Pfeffer 1982). At the interpersonal level, the primary sources of power for an individual arise out of the actor's office (structural position), personal characteristics, expertise and access to specialised knowledge (Bacharach & Lawler 1980). Theories on *situational empowerment* imply that organisational actors who have power are more likely to achieve their desired outcomes than actors who lack power. The empowerment process for managers under these assumptions involves power sharing with subordinates (Conger & Kanungo 1988). The process involved in creating situational empowerment involves increasing access to resources and information for individuals at these lower levels. A review of the literature suggests that *situational empowerment* exists when companies implement practices that distribute power, information, knowledge and rewards throughout the organisation (Lawler *et al.* 1995). Organisations can redistribute power by giving employees latitude in how they perform their daily tasks and deal with unforeseen problems (Perkins & Zimmerman 1995). In addition, empowerment has been viewed as a relational dynamic, the process of empowerment involving leaders or managers sharing power with subordinates. Power in this context is interpreted as,

... *the possession of formal authority or control over organizational resources*
(Conger & Kanungo 1988, p. 473).

Principals of state schools in Victoria have been in receipt of increased decision-making power since 1995 following the *Schools of the Future* initiative of the state government that began in 1993. Its purpose was to increase *situational empowerment* for school principals²⁴. The focus of this thesis, however, is not on the processes of transferring power; rather it focuses on the effects of that power transfer upon the *psychological empowerment* of managers.

Psychological empowerment

Psychological empowerment refers to empowerment at the individual level of analysis (Zimmerman 1990). It is a conceptualisation that relates to situations in which power and control are used as motivational and/or expectancy belief states that are internal to individuals (Conger & Kanungo 1988). *Psychological empowerment* refers to the extent to

²⁴ Refer to Section 2.6 for details of this initiative.

which an individual's cognitions are such that they feel that they have the power to control their environment. 'Power' connotes an internal urge to influence and control others, that individuals are assumed to have a need for such power (McClelland 1975) and an individual's power needs are met when they perceive that they have power or when they believe they can adequately cope with events, situations and/or the people they confront. On the other hand, individuals' power needs are frustrated when they feel that they lack power or when they believe that they are unable to cope with the physical and social demands of the environment (Conger & Kanungo 1988).

Psychological empowerment is considered to be a multi-faceted variable, one that cannot be captured by a single concept and best perceived as a variable in which each level of analysis is interdependent with others (Zimmerman 1995). *Psychological empowerment* has been defined as,

... the increased intrinsic task motivation manifested in cognitions that reflect an individual's active orientation to his or her work role (Spreitzer 1995a, p. 1443).

The recent literature on empowerment within the management sphere focuses on *psychological empowerment*, (Spreitzer, de Janasz & Quinn 1999). Within this literature *psychological empowerment* and the cognitions that arise out of devolutionary processes are seen to be more relevant to good management than the mere act of increasing empowerment by means of administrative changes²⁵. One stream of management literature focuses on the refinement of the *psychological empowerment* variable within the workplace context, evaluating the behavioural and the affective outcomes within that environment in terms improved management. The purpose of this thesis is to extend that work by focusing on the *psychological empowerment* of public sector managers who operate within a setting characterised by recent initiatives involving increased *situational empowerment*.

3.3 Research model

The contribution of this thesis is the development of a set of hypotheses, summarised in a model linking *psychological empowerment* and its antecedents through *transformational*

²⁵ This is an example of *situational empowerment* (described above).

leadership to innovation in management structure. The model describes the role of *psychological empowerment* and *transformational leadership* as they operate for managers (state school principals) in a work context. It was developed from the partial nomological network²⁶ of empowerment in the work place developed initially by (Spreitzer 1995a). A brief description of that network follows.

3.3.1 Nomological network of workplace empowerment

Organisational researchers have sought to gain an understanding of *psychological empowerment*²⁷ as it is manifest in the workplace, the overarching variable being operationalised into four dimensions. These dimensions are *competence, impact, meaning* and *self-determination*; and *psychological empowerment* has been conceptualised as a 'gestalt' of these four dimensions (Conger 1989). Later research involved development of a partial nomological network of empowerment that identifies certain antecedent factors as well as outcomes related to managerial effectiveness (Spreitzer 1995a, Spreitzer 1995b). This thesis seeks to provide support for the Spreitzer (1995a) network and aims to extend it by carrying out the investigation within a specific work context²⁸. A diagram of Spreitzer's partial nomological network is contained in Figure 3-1.

3.3.2 Model development

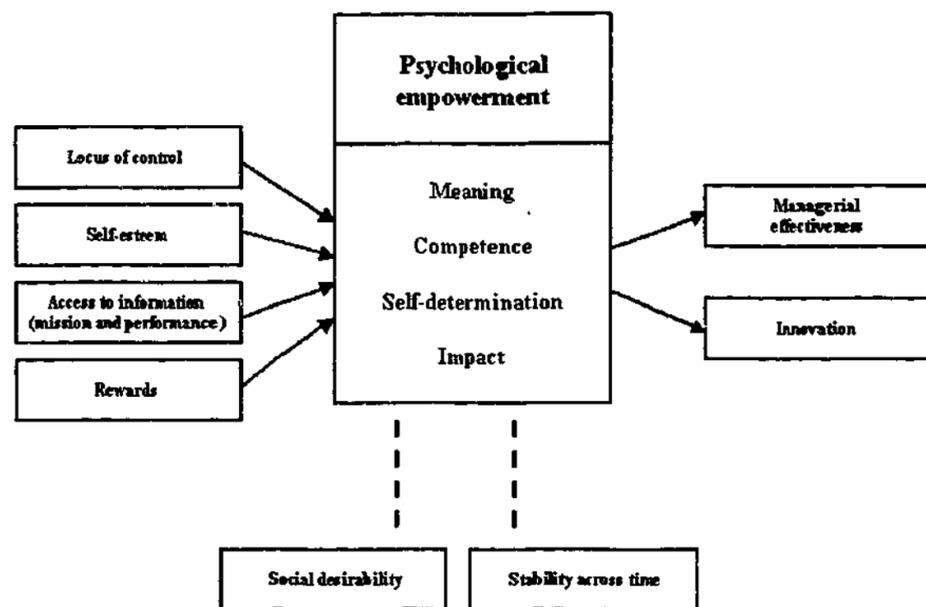
A model, suitable for empirical testing and adapted to suit the research population, was developed from this partial nomological network. Investigating the network within a particular context provides richness to the literature by including factors peculiar to that environment. An aim is to provide a better understanding of this tentative network. To achieve this, *transformational leadership* was included in the model as an intervening variable between *psychological empowerment* and *innovation in management structure* (rather than modelling 'innovation' as a direct outcome of *psychological empowerment*). The model is contained in Figure 3-2.

²⁶ To recap, a nomological network is defined as a theoretical framework that specifies relationships among variables in such a way as to help both differentiate and define the variable of concern and that enables the formulation of a measurement model (Cronbach & Meehl 1955).

²⁷ Concepts and variables critical to this thesis are presented in italics. Operational definitions for each of these are contained in Chapter 1.

²⁸ The context, state school education, is described in detail in Section 2.6.

Figure 3-1 Psychological empowerment in the workplace



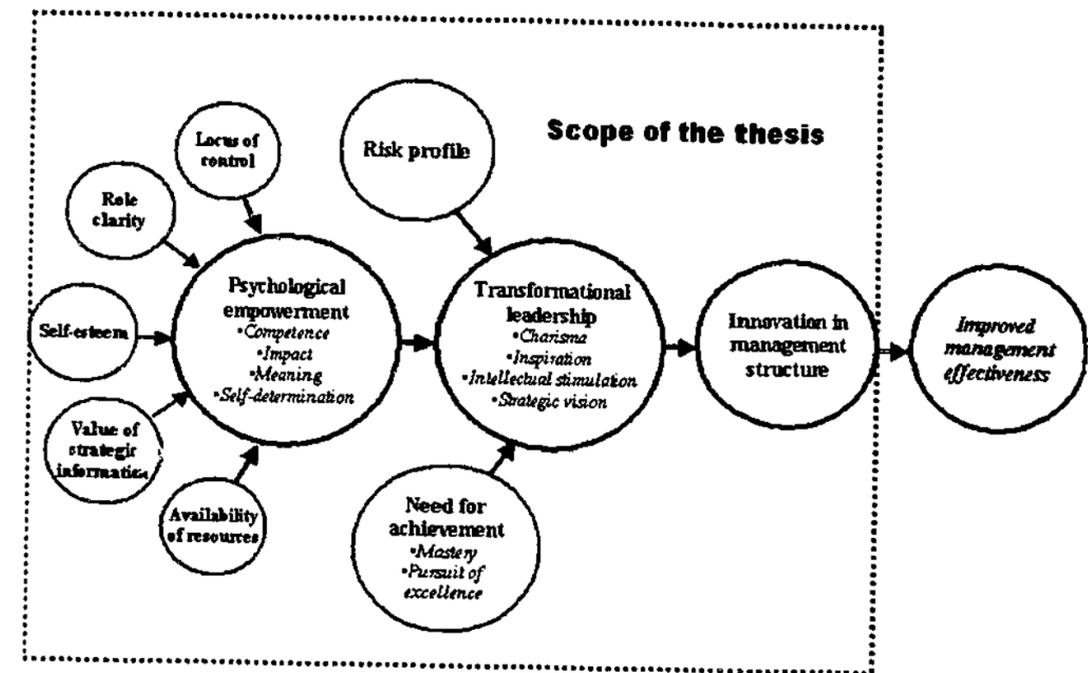
(Spreitzer 1995a)

The first part of the model (observed at the left-hand side of Figure 3-2, each with an arrow depicting the direction of the influence) describes the influence of six various antecedents to *psychological empowerment*. They are *locus of control*, *self-esteem*, *role clarity*, *value of strategic information* and *availability of resources*. The second part of the model describes the influence that *psychological empowerment* and two other factors (*need for achievement* and *risk profile*)²⁹ have on *transformational leadership*. The third part of the model hypothesises the relationship between *transformational leadership* and *innovation in management structure*. For purposes of completeness, the final part of the model describes a link between *innovation in management structure* and management effectiveness. Due to the difficulty in measuring management effectiveness within the research environment (that is, improved student outcomes) and the difficulty in attributing

²⁹ Although not of direct interest to this thesis, need for achievement and risk profile were included in the model to minimise specification error (the error that arises from omitting important variables (Hair *et al.* 1998, pp. 593-594).

effectiveness to particular factors (differences in student outcomes come about for a variety of reasons), quantitative testing of this link is not included in the analysis.

Figure 3-2 Research model



To the extent that it was possible, the selection of the six antecedents was based on their relevance to the experiences of state school principals³⁰. Note that antecedents fall into two groups and relate to the global individual-level characteristics and perceptions of managers and the work context. They are described more fully below in Section 3.5.

Inspection of the next part of the model reveals that *transformational leadership* is hypothesised to comprise five dimensions. They are *charisma* (labelled as 'Charisma'), *inspiring subordinates* ('Inspiration'), *intellectual stimulation* ('Intellectual stimulation') and *strategic vision and articulation* ('Strategic vision'). Discussion of the dimensions of *transformational leadership* is contained in Section 3.6.

Observation of the next part of the model reveals *psychological empowerment* as one of three factors that affect levels of *transformational leadership* for managers. For the

³⁰ An example of a variable omitted from the model is 'rewards'. State school principals are not subject to a performance incentive award system.

purposes of model completeness (and to minimise specification error), two other factors are included. They are *need for achievement* and *risk profile*. A description of these factors is contained in Section 3.7.

The next stage of the model reveals the relationship between *transformational leadership* and *innovation in management structure*. A description of this relationship is contained in Section 3.8. The final link in the model describes the effect of *innovation in management structure* on improved management effectiveness in terms of the achievement of stated aims and objectives. It is beyond the scope of this thesis to test the hypothesis that links these two factors, although a discussion of this relationship is presented in Section 3.9.

3.4 Conceptualising psychological empowerment

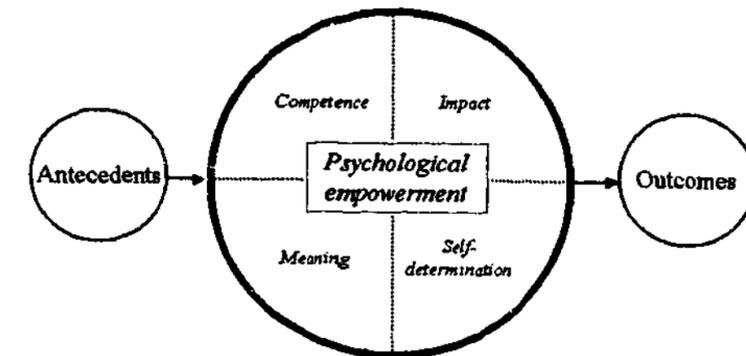
Psychological empowerment relates to situations in which power and control are used as motivational and/or expectancy belief states that are internal to individuals (Conger & Kanungo 1988). *Psychological empowerment* is an individual-level variable, developed from the research of (Spreitzer 1995a). It is defined as follows.

Psychological empowerment is the increased intrinsic task motivation manifested in cognitions that reflect an individual's active orientation to his or her work role.

An active work orientation refers to the individual's ability and desire to shape his or her work role and context. It has been found that *psychological empowerment* comprises multiple dimensions and that the variable cannot be captured by one single concept (Conger & Kanungo 1988). A review of the literature reveals support for this view and there is indication that *psychological empowerment* comprises four cognitions. They are *competence*, *impact*, *meaning* and *self-determination* (Thomas & Velthouse 1990, Spreitzer 1995a)³¹. The dimensions and overall 'gestalt' of *psychological empowerment* relate to the ways in which managers perceive themselves in the work-specific context. Figure 3-3 contains a diagrammatic representation of the four dimensions of *psychological empowerment* in relation to the rest of the model.

³¹ There is support for this conceptualisation in terms of both internal consistency and test-retest reliability for each of the scale items.

Figure 3-3 Dimensions of psychological empowerment



A discussion of each of the four dimensions of *psychological empowerment* follows.

3.4.1 Competence

Competence is the self-belief that one possesses the skills and abilities necessary to perform a job or task well (Gist 1987), the concept having been studied variously as 'self-efficacy' and 'personal mastery'. *Competence* is a belief in one's capability to perform work activities with skill (Gist & Mitchell 1992). More recently, *competence* was referred to as the degree to which a person can perform task activities skilfully when he or she tries (Leithwood 1994). It has been defined as the individual's belief in his or her capability to perform activities with skill (Spreitzer & Quinn 1996). *Competence* corresponds with agency beliefs, personal, or effort-performance mastery (Bandura 1989).

Outcomes of feelings of low self-efficacy have association with people avoiding situations that require the relevant skills and this avoidance behaviour, in turn, tends to prevent an individual from confronting fears and improving perceived *competence* (Leithwood & Steinbach 1995). On the other hand, (Bandura 1977) found support for the idea that high 'self-efficacy' tends to result in initiating behaviours, high effort and persistence in the face of obstacles. For the purpose of this thesis, *competence* is defined as follows.

Competence is the self-belief that one possesses the skills and abilities necessary to perform a job or task well.

3.4.2 Impact

Impact is the belief that one has significant influence over strategic, administrative or operational outcomes at work (Ashforth 1989) and has been described as the extent to which behaviour is seen as 'making a difference' in terms of accomplishing the purpose of the task (Leithwood 1994). The notion of perceived *impact* has been studied under a number of different labels, most especially 'locus of control' and its converse, 'learned helplessness'. *Impact* is distinguished from 'locus of control' since this is a global personality characteristic that endures across situations (Wolf & Robertshaw 1982) and is therefore not peculiar to a particular situation. *Impact* is more relevant to this thesis as a measure of *psychological empowerment* than 'locus of control' since it relates specifically to managers operating within a work context³². Martinko and Gardner (1982) identified *impact* as the converse of 'learned helplessness' and two forms of this variable have been identified; they are universal helplessness and personal helplessness. 'Universal helplessness' (identified as being similar to 'external locus of control') occurs when impact is seen as unlikely, regardless of performance and is the negative form of the variable relevant for *impact*. Experimental work demonstrated the following as outcomes of 'learned helplessness' (Abramson, Seligman & Teasdale 1978). They are dampened ability to recognise opportunities, reduced motivation and depressed affect. Personal helplessness occurs when a person perceives that impact would be possible but the person lacks the competence to perform the task (or tasks). For the purpose of this thesis, *impact* is defined as follows.

Impact is the belief that one has significant influence over strategic, administrative or operational outcomes at work.

3.4.3 Meaning

Meaning has been identified as a dimension of the job characteristics model (Hackman & Oldham 1980) and involves a fit between the requirements of a work role on one hand and the individual's beliefs, values and behaviours on the other (Brief & Nord 1990). *Meaning*, or 'meaningfulness' is the value of a work goal or purpose, judged in relation to

³² Rather than treat 'locus of control' as a dimension of *psychological empowerment*, the model in this thesis describes *internal locus of control* as an antecedent variable, one that influences (rather than measuring) *psychological empowerment*.

an individual's own ideals or standards and is the value of the task or goal or purpose; it is an investment of emotional significance in an activity or activities (Leithwood 1994). Outcome factors for *meaning* are believed to be, for low levels, apathy, detachment and feeling unrelated to significant events. For high levels of *meaning*, the outcomes are hypothesised to be commitment, involvement and concentration of energy (Sjoberg, Olsson & Salay 1983).

It is anticipated that school principals will demonstrate a high degree of fit between the role they perform as head of a school and the value of the goals of school education. The opportunity cost of entering the teaching profession is, potentially, a more highly paid career in a different profession. Thus, the decision to enter teaching is motivated more strongly by non-financial rewards, including a sense of self-satisfaction and lifestyle advantages such as longer and more frequent non-teaching time. At another level, rewards include the part played by the teaching professionals in guiding young people through their formative years, assisting them in the learning process. A report on excellence in leadership in schools identifies that most effective principals' passion for teaching and learning,

... permeates everything they do, inspiring and energising staff, students and the community to commit to the educational agenda (Hay/McBer 1999, p. 10).

The report identifies that principals who demonstrate this competency will shape educational outcomes pro-actively. Their actions and decisions are guided by their concern to have a positive and lasting impact on the school community. This capability also inspires others to act in accordance with leaders' commitment to teaching in general and to the process of teaching and learning in particular (Hay/McBer 1999). For the purpose of this thesis, *meaning* is defined as follows.

Meaning is the value of a work goal or purpose, judged in relation to an individual's own ideals or standards and is the value of the task or goal or purpose; it is an investment of emotional significance in an activity or activities.

3.4.4 Self-determination

Self-determination is an individual's sense of having choice in initiating and regulating actions and a feeling of having control over one's work (Deci, Connell & Ryan 1989). It reflects autonomy in the initiation and continuation of work behaviours and processes.

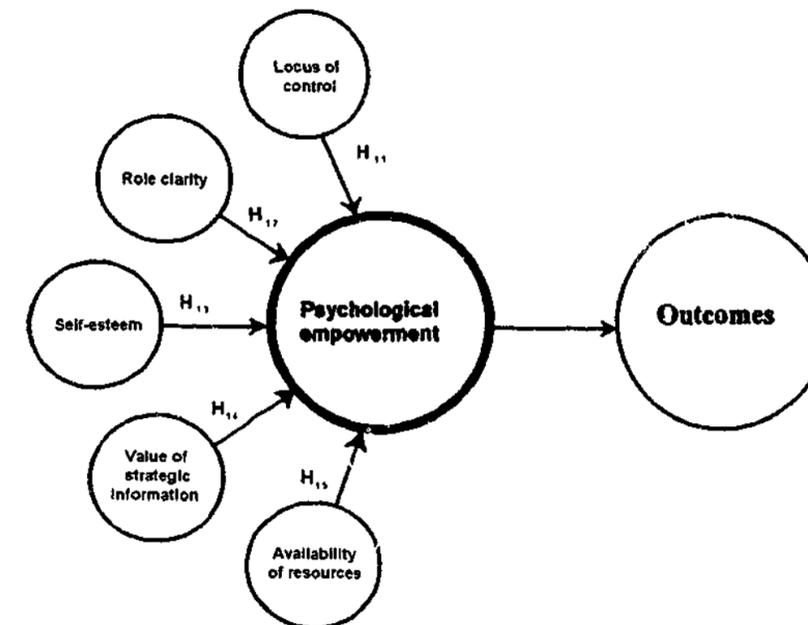
Examples include making decisions about work methods, pace and effort (Bell & Staw 1989, Spector 1986). This dimension has been referred to as 'choice' because that term is more specific than *self-determination*. However, 'choice' is thought to be more abstract or philosophical (Leithwood 1994). In this thesis the dimension is referred to as *self-determination* in order to align the concept with Spreitzer's (1995a) overarching concept. Within the literature on *self-determination*, 'perceived choice' (another conceptualisation of *self-determination*) has been observed to produce greater flexibility, creativity, initiative, resiliency and self-regulation. It has also been observed that when a person is controlled by events, that person experiences tension. This is a more negative emotional tone and a lower sense of self worth (Deci & Ryan 1985). For the purpose of this thesis, *self-determination* is defined as follows.

Self-determination is an individual's sense of having choice in initiating and regulating actions and a feeling of having control over one's work.

3.5 Influences on psychological empowerment

The nomological network developed by (Spreitzer 1995a) suggested that certain antecedent factors influence a person's *psychological empowerment* within a work context. Two sets of antecedents were identified. They are personality traits and contextual factors. This section contains an explanation of the role of antecedents to *psychological empowerment*, explaining each and providing testable hypotheses that link these antecedents with the dimensions of *psychological empowerment*. To distinguish the two groups, personal-level antecedent factors are global perceptions of an individual, while the dimensions of *psychological empowerment* are characteristics that are shaped by an individual's work context. A contribution of this thesis is the re-assessment of antecedent factors included in prior studies of *psychological empowerment*, identifying those that are relevant for principals of large state schools. Figure 3-4 contains a diagrammatic representation of the way in which the six hypothesised antecedents to *psychological empowerment* fit within the model.

Figure 3-4 Antecedents to psychological empowerment



3.5.1 Personality traits

Personality traits shape how individuals see themselves in relation to their work environments and are particular to an individual. They are not dependent upon the context within which the person operates. Within the cognitive model of empowerment, global assessments are assumed to be inductive generalisations from past task assessments (Thomas & Velthouse 1990). Under this model, task assessments are shaped by a person's global characteristics. When interpreting events from available information that leaves room for ambiguity, individuals tend to make task assessments that are consistent with their past experience (Thomas & Velthouse 1990). Personal characteristics of state school principals are expected to affect the level of *psychological empowerment* that they experience. Three personality traits that affect empowerment have been identified. They are *internal locus of control*, *role clarity* and *self-esteem* (Spreitzer 1995a). Next follows an explanation of three personal-level antecedents to *psychological empowerment*, along with testable hypotheses.

Internal locus of control

'Locus of control' is a concept that captures the belief that individuals have about who controls the key events in their lives, whether it be themselves on one hand, or various external factors such as other people, chance events or the government. Those people who perceive their lives to be controlled by their own actions, skills and abilities are characterised as 'internals'. Conversely, those who perceive their lives to be controlled by external forces are characterised as 'externals'. In summary, *internal locus of control* explains the degree to which individuals themselves, rather than external forces, determine what happens in their lives (Rotter 1966). For the purpose of this thesis it is defined, operationally, as follows.

Internal locus of control explains the degree to which principals believe that they, rather than external forces, determine what happens in their lives.

Previous research, for example Miller (1987), has shown that internally oriented company chief executive officers (CEOs) are more likely to belong to firms that plan, actively seek information about the business environment and have a tendency to lead, rather than follow, competitors. CEOs characterised as 'internals' are more likely to inhabit dynamic environments and to have a relatively differentiated organisational structure compared with their externally oriented counterparts. For example, empirical support has been found for the idea that CEOs with an 'internal' locus of control exhibited more product innovation, a future-oriented outlook and demonstrated approaches tailored to meet circumstances (Miller, Dröge & Toulouse 1986)³³. Conversely, externally oriented CEOs are less likely to belong to organisations that engage in long-term strategic planning or seek information about the business environment. In the case of state school principals, it is anticipated that principals characterised as 'internals' under school-based management³⁴ will be more likely to feel empowered than principals characterised as *externals*. *Internals* are predicted to adopt a cognition that embraces a 'can-do' attitude and to take advantage the

³³ Miller *et al.* (1986) also found that relationships between CEO personality and a firm's organisational characteristics were found to be stronger in smaller firms. This supports the notion of the importance of locus of control within state schools, lying at the lower (rather than the higher) end of the organisation size scale.

³⁴ Refer to Chapter 2 for details of school-based management and the implications that *Schools of the Future* has for principals working within the Victorian *Department of Education, Employment and Training*.

management freedom that SBM offers. *Externals*, on the other hand, will be more likely to feel as though the Victorian *Department of Education, Employment and Training* controls schools' operations.

Failure to find empirical support for the link between *locus of control* and *psychological empowerment* was a surprising result for Spreitzer (1995b) since it was thought that the theoretical links were 'quite strong' (Spreitzer 1995a, p. 1458). An explanation for this surprising result was attributed to measurement limitations. Despite these findings, however, *internal locus of control* was included in this thesis for purposes of completeness and to minimise specification error³⁵. This leads to the following hypothesis.

Hypothesis 1-1: Internal locus of control is positively related to psychological empowerment for state school principals

Role clarity

Role clarity is the extent of understanding that an individual has over his or her function within the organisation. It has also been defined as the degree to which a worker is certain about how he or she is expected to do the job (Bandura 1989). The concept is also understood with a consideration of its converse, 'role ambiguity', which occurs when an individual is unsure about what the expectations others have of herself, or himself and has been described as a condition resulting from uncertain information about role behaviour (Kahn *et al.* 1964). Uncertainty can arise from complex organisational structures or poor communication between organisational members. 'Role ambiguity' has been found to exert a negative influence on *psychological empowerment* (Spreitzer 1995a). For purposes of consistency with other hypotheses in this thesis, however, *role clarity* (the positive form) is chosen for hypothesis testing since it is anticipated that it exerts a positive influence on *psychological empowerment*. Role clarity is defined, operationally, as follows.

Role clarity is the extent of understanding that principals have over their function within the school.

According to role theory, every position in a formal organisational structure should have a clear set of responsibilities. If this is the case, management can provide appropriate guidance and direction to subordinates, thereby holding them accountable for their

³⁵ Specification error is the error made by failing to include factors that ought to be included in a model.

performance (Rizzo, House & Lirtzman 1970). It is argued that if people do not know the extent of their authority they would hesitate to act, feel unable to make a difference, be low in self-confidence and be fearful of potential repercussions for decisions made under ambiguous authority. These outcomes link with the dimensions of *psychological empowerment*, namely *competence, impact, meaning and self-determination*. In addition, role ambiguity has also been linked with low levels of intrinsic motivation (Luzzo 1993).

It has also been suggested that role perceptions are better predictions of performance than any other predictors (Churchill et al. 1985). In relation to *psychological empowerment*, support has been found for a negative link between 'role ambiguity' and the dimensions of *psychological empowerment* and this relationship demonstrated the strongest relationship to empowerment of all the contextual factors examined (Spreitzer 1995a).

Although Conger & Kanungo (1988) suggests that significant organisational change is a factor that potentially lowers a person's belief of self-efficacy (task capability), the nature of the change wrought upon state school principals is one of freedom to operate independently. Following the introduction of *Schools of the Future*, school principals will have varying perceptions of their new role and what that role will be. Thus, *role clarity* is of particular interest in terms of the extent to which principals understand their roles following the introduction of *Schools of the Future*. This leads to the following hypothesis.

Hypothesis 1-2: Perceptions of role clarity of state school principals is positively related to their psychological empowerment.

Self-esteem

Self-esteem refers to individuals' personal judgement of their own worth and refers to a global construct that taps individuals' self-evaluations and not merely their confidence judgements across a wide variety of situations (Coopersmith 1967, Brockner 1988). It is considered to be a trait reflecting an individual's characteristic, affective evaluation of the self (Spreitzer & Quinn 1996). In this thesis it is operationally defined as follows.

Self-esteem is a trait reflecting principals' characteristic, affective evaluation of themselves.

Self-esteem is distinguished from 'self-determination', which relates to an individual's judgement about task capability that is not inherently evaluative. The distinction is important in this thesis since the global sense of *self-esteem* is modelled as a personal-level

antecedent variable to *psychological empowerment* and is not workplace specific. *Self-determination*, on the other hand, relates specifically to a workplace environment and is hypothesised as a dimension of *psychological empowerment*.

It has been found that individuals who hold themselves in high esteem expect success and as a result are more vigorous and assertive in their actions (Pierce et al. 1989). They are likely to have more self-confidence about what they can achieve (Brockner 1988) and to extend their feelings of self worth to a work-specific sense of competence (Leithwood & Steinbach 1995)³⁶. Such individuals see themselves as valued resources, having talents worth contributing. They are therefore more likely to assume an active orientation to work and work units (Spreitzer 1995b, Spreitzer & Quinn 1996)³⁷. This, in turn, increases their sense of competence and increases their sense of ability to influence the outcomes of the organisation. Taken together, these aspects of self-esteem indicate that managers who exhibit high levels are likely to have a stronger sense of empowerment than managers who are low in self-esteem. They are likely to extend their feelings of self-worth to a work-specific sense of competence (Bandura 1977). In an empirical study designed to investigate the influence of *self-esteem* on *psychological empowerment*, Spreitzer's analysis revealed a significant, positive relationship (Spreitzer 1995b). This leads to the following hypothesis.

Hypothesis 1-3: The self-esteem of state school principals is positively related to their psychological empowerment.

3.5.2 Contextual factors

Contextual factors are those that exist within a work environment and that affect an individual's perceptions. The work context (work practices and policies) affects an individual's *psychological empowerment* by facilitating or inhibiting feelings of individual power within a particular environment and there are many work practices that affect the *psychological empowerment* experienced by individuals. A review of the organisational literature investigating contextual factors that contribute to the lowering of self-efficacy among organisational members identified four that had most influence; they are

³⁶ In contrast, individuals who demonstrate low self-esteem have little belief in their ability to achieve and tend to capitulate in the face of opposition (Michener, Delmater & Schwartz 1990).

³⁷ Conversely, Zimmerman (1990) found that individuals with little self-esteem are not likely to see themselves as able to make a difference or influence their work organisations.

supervisory style, reward systems and job design (Conger & Kanungo 1992). These factors were also hypothesised by Spreitzer (1995a) to have an effect upon *psychological empowerment*.

Two factors used in prior studies were omitted from examination in this thesis, however, because of the factors peculiar to the work environment of state school principals. They are 'supervisory style' and 'rewards'. 'Supervisory style' was excluded since, under SBM, principals act autonomously within their school and they have no direct line management responsibility to the *Department of Education, Employment and Training*. Similarly, the influence of reward systems were excluded since school principals are salaried employees, and no effective performance-based bonus system was in place at the time of the survey. A third factor believed to influence *psychological empowerment*, 'access to strategic information', has been modified due to its special nature and the way it operates within state school principals' work environment. Two additional contextual factors were added; they are *availability of resources* and *role clarity*. Next follows an explanation of two contextual-level antecedents to *psychological empowerment*, along with testable hypotheses.

Value of strategic information

There are two types of strategic information critical for the empowerment of managers. One relates to the organisation's mission; the other relates to a person's achievements in relation to that mission (Lawler 1992). Information relating to the organisation's mission is important for the empowerment of managers because it helps to create a sense of value and purpose within a manager (Conger & Kanungo 1988). The argument is that if the manager has knowledge of the mission (the business with which an organisation is charged), that person will be capable of taking initiative and without that knowledge initiative is not possible. In identifying ways to increase empowerment to employees, it has been suggested that top level management,

... must make more information more available to more people at more levels through more devices (Kanter 1983, p. 5).

The other dimension of 'information' relates to an understanding of the performance of an organisation (or unit) in relation to its mission. With such information, a manager is able to compare performance with the mission, thereby engendering confidence in the making of decisions that maintain or improve performance in relation to that mission. Thus, the

combination of access to strategic information and feedback information relating to the achievement of the mission increases the ability of the manager to make decisions that are aligned with the organisation's mission, thereby increasing his or her decision-making focus (Lawler 1992). This results in an increased sense of empowerment for managers. Spreitzer (1995a) identified empirical support for the positive influence of 'access to information' on *psychological empowerment*.

Under the compulsory accountability requirements of the *Schools of the Future*³⁸ initiative of the State Government of Victoria, principals are required to participate in a *Triennial Review* process that encapsulates the two dimensions of strategic information outlined above. As identified in Chapter 2, this involves the development of a *School Charter* (the school's mission), publication of annual reports and a written evaluation (*Triennial Review*) at the end of every three-year period. These three documents form an integrated and systematic planning, monitoring, reporting and review framework that is determined by the Office of review, Department of Education, Victoria (1997). This framework,

- allows a school to develop its own educational plans and priorities within government guidelines;
- allows a school to monitor its progress and to establish whether its objectives are being met; and
- provides performance information to the local community of a school and to the department of education.

Since the process involves the generation of the mission (the *School Charter*), as well as provision of feedback of information regarding its attainment (via the *Triennial Review*), it encapsulates the two aspects of strategic information identified by Lawler (1992) and hypothesised by Spreitzer (1995b) to affect *psychological empowerment*. Unlike the population studied by Spreitzer, however, the compulsory nature of the accountability process for state school principals requires a different approach for research purposes. An important contribution to both theory and policy-making in this thesis is to identify whether strategic information, produced as a result of accountability processes that are imposed (compulsory), acts as an empowering factor for school principals.

³⁸ As outlined in Chapter 2, *Schools of the Future* is an initiative designed to introduce school-based management into Victorian state schools.

As the generation of accountability information by principals is compulsory, it is the value placed upon the information generated from the accountability processes (rather than whether they have access to strategic information) that is hypothesised to affect the principals' feelings of empowerment in this thesis. The conceptualisation relating to strategic information and its effect upon empowerment is therefore different from that of earlier studies. To distinguish this approach from earlier studies, this factor is referred to as *value of strategic information* and is defined, operationally, as follows.

Value of strategic information is the value placed on strategic information feedback as a result of the School Charter/Triennial Review processes³⁹.

At the negative end of the *value of strategic information* scale are principals who regard the *Triennial Review* as a bureaucratic imposition on the way that the school is managed and such principals engage in the process merely as a compliance measure. Information generated by the process is perceived as having marginal value. At the positive end of the *value of strategic information* scale are principals who embrace the *Triennial Review* and value the information created. Such principals actively engage relevant parties in this process, carefully analyse the *Triennial Review* and ensure that all recommendations are incorporated into the subsequent *School Charter*. Principals who value the strategic information feedback relating to the achievement of the school's charter are expected to experience higher feelings of empowerment compared with those who do not value this information. This leads to the following hypothesis.

Hypothesis 1-4: The state school principal's perception of the value of the strategic information is positively related to their psychological empowerment.

Availability of resources

Within the private sector, managers require access to an appropriate level of resources in order to achieve the goals of their organisation. Resources include finance, time, materials and space. Without these the output of a firm cannot be produced. The descriptor 'access to resources', that used by (Spreitzer 1996), has been modified in this thesis to *availability of resources* because it was felt that this captured the concept more concisely. It is defined, operationally, as follows.

³⁹ Discussions of the *School charter/Triennial Review* processes are contained in Chapter 2.

Availability of resources is the perception that the resources available are adequate to meet the needs of principals in achieving their aims.

Within the private sector, the decision to obtain resources necessary to achieve its goals is made with reference to the markets for the resources themselves and the market for the firm's output. According to Coase (1937, p. 393), the firm exists as a result of the operation of both the market and the entrepreneur and a firm,

... consists of the system of relationships which comes into existence when the direction of resources is dependent on an entrepreneur.

With the introduction of *Schools of the Future*, private sector principles have been introduced into state schools, encouraging principals to adopt more of an entrepreneurial role. Principals now have greater control over the direction of the allocation of resources available to them. They require an adequate level of resources to direct towards the attainment of their goals as set out in the *School Charter*. Although the funding available to each school (its *Global Budget*) is dependent upon the total number of student enrolments under *Schools of the Future*, the level of funding per student is determined centrally. The level of resources available to a school determines the breadth and depth of curriculum offered and higher student enrolment numbers produce higher levels of funding. This creates economies of scale and allows the principal to offer the type of curriculum he or she feels is appropriate for the school, to develop and introduce new curriculum and to facilitate the alignment of learning opportunities with the needs of the community it serves.

Lack of access to critical organisational resources has been found to contribute to powerlessness and dependency (Homans 1958). On the other hand, access to resources enhances the individual's sense of self-efficacy and control over environmental contingencies (Bowen & Lawler 1992, Gist & Mitchell 1992, Zimmerman 1995). Thus, school principals who perceive they have higher level of available work unit resources are hypothesised to experience a stronger sense of empowerment than individuals who perceive they have a lower availability of these resources. Principals who perceive the level of resources to be inadequate will be constrained in their feelings of empowerment in terms of the scope of the curriculum their schools can offer. This leads to the following hypothesis.

Hypothesis 1-5: State school principals' perceptions of the availability of adequate resources are positively related to their psychological empowerment.

3.6 Transformational leadership

The concept of leadership is very difficult to identify clearly and searching for one definition of leadership appears to be fruitless (Bass 1990). It can mean different things to different researchers depending upon the timeframe and the location of the research. Among other definitions, leadership has been described as '... the initiative of a new structure or achievement' (Stogdill 1950, p. 4) and '... the initiative of a new structure or procedure for accomplishing an organisation's goals and objectives or for changing an organisation's goals and objectives' (Lipham 1964, p. 123).

While several theoretical models of 'transformational leadership' have been proposed (Bass 1985, Conger 1989, Conger & Kanungo 1987, House 1977, House & Shamir 1993, Roberts 1985), two streams of research are identified as relevant for this thesis. They are the Conger-Kanungo model of 'charismatic leadership' (Conger et al. 1997), and Bass and Avolio's model of 'transformational leadership' (Avolio, Bass & Jung 1999). Each is discussed in turn.

3.6.1 Charismatic leadership

'Charismatic leadership' originated with the work of Weber (1947), who developed a typology of three ideal types to describe the forces of authority in society; they are the traditional, the rational-legal and the charismatic. The first two of these are thought to stabilise and bring order to society, whereas charismatic forces bring about change and disorder. Weber used 'charisma' as an overarching term to describe the forces of change and innovation in society, largely referring to political and religious leaders. Only 'charismatic leadership' is relevant in this thesis since it is the only factor of the three that is hypothesised to bring about change (innovation).

The Conger and Kanungo scale (Conger & Kanungo 1988, Conger 1989, Conger & Kanungo 1992, Conger et al. 1997) closely parallels Weber's (1947) conceptualisation of charismatic leadership (Conger & Kanungo 1994). It reflects five dimensions, 'strategic vision and articulation', 'sensitivity to the environment', 'unconventional behaviour', 'personal risk' and 'sensitivity to members'. In the Conger and Kanungo formulation, followers perceive the exceptional nature of the leader through the leader's behaviour that

corresponds to the dimensions of unconventional behaviour and personal risk (Conger et al. 1997). According to Weber, charismatic leaders are those who have a prophetic vision of the future. Charismatic leadership refers mainly to leadership based on personal identification of followers with the leader (Sashkin 1992).

There has been some discomfort, however, with the concept of 'charismatic leadership' amongst those who are interested in leadership that brings about change. For example, negative connotations have been implied through the suggestion that charismatic leaders can be mercurial, self-obsessed and destructive of others (Bryman 1992); that it can lead to 'group-think' amongst followers (Conger 1990); and that charismatic leadership can, indeed, be dysfunctional (Sashkin 1992).

3.6.2 'Transformational' leadership

'Transformational' (change-oriented) leadership first appeared as a concept of interest in management research with the publication of Downton (1973), while a later, independent reference to the concept, was made by Burns (1978). Since the publication of these studies, there has been a great deal of interest in identifying the characteristics of good leadership and identifying individual characteristics that make a good leader.

Throughout the 1980s and 1990s, organisational researchers focused on 'charismatic' leaders (see above) in an effort to understand the transformation and innovation activities in a corporate climate and management at that time was perceived as being largely unadaptive and bureaucratic (Conger et al. 1997). Coupled with this were the increase in competitiveness arising out of globalisation and the identification of the need for organisations to become open to change. As a consequence there has been a focus within the organisational literature on the role of leadership, especially on those leaders who can motivate change. Development of *transformational leadership* as a distinct variable has taken place since the initial conceptualisation using a six-factor model of leadership containing elements that are 'transactional', or '*laissez-faire*'⁴⁰ and 'transformational'

⁴⁰ Transactional leadership emphasises the transaction (exchange) that takes place among leaders, colleagues and followers. The leader discusses with others what is required and specifies the rewards that arise out of the achievement of those requirements. Transactional leaders recognise what followers want and promise to help them achieve what they want in exchange for support (Bass & Avolio 1994). Two factors comprising 'transactional leadership' are active/passive avoidant leadership; the former operating when leaders await

(Bass 1985). Of these, only 'transformational' leadership is of interest in this thesis since it is concerned primarily with change. Bass (1985) put forward the idea that *transformational leadership* enables followers to go above their own self-interests for a collective, higher purpose or vision and to exceed performance expectations. Transformational leaders, he argued, communicate a compelling vision of the future ('charisma'), provide emotional appeals to increase awareness of mutual goals ('inspirational motivation'), encourage followers to question traditional ways of doing things ('intellectual stimulation') and treat followers differently but equitably on a one-to-one basis ('individualized consideration') (Bass & Avolio 1993).

As is evident from this discussion, gaining a clear understanding of *transformational leadership* and its various hypothesised dimensions has proved especially difficult and this view is supported in the literature (Yukl 1999). There have been several recommendations to modify the components of the original model (Bryman 1992, House & Podsakoff 1994, Yukl 1994, Bycio, Hackett & Allen 1995). For the purpose of this thesis, however, *transformational leadership* is conceptualised as a blend of these two streams of research, and is defined as follows.

Transformational leadership is the ability of principals to stimulate interest among colleagues and followers to view their work from new perspectives, to generate awareness of the mission or vision of the team and organisation, to develop colleagues and followers to higher levels of ability and potential and to motivate colleagues and followers to look beyond their own interests toward those that will benefit the group.

3.6.3 Modelling transformational leadership

The process of developing an understanding of the concept of leadership and its various dimensions has taken place over a long period and, as evidenced by recent studies, its conceptualisation is far from clear (Pawar & Eastman 1997, Avolio *et al.* 1999). The two streams of research (outlined above) seem to fall into two differing, yet complementary, definitions. They are 'transformational' leadership and 'charismatic' leadership (Pawar & Eastman 1997) and four dimensions have been determined to be most relevant. They are

charisma, inspiring subordinates, intellectual stimulation, and strategic vision and articulation (Bass 1985, Bass 1990, Avolio *et al.* 1999).

'Transformational leadership', along with 'charismatic leadership' is identified by (Weber 1947) as a sub-set of the overarching concept 'strategic management'. In contrast to transactional leaders, whose focus is on the exchange relationships between themselves and followers to meet their own self-interests (Bass 1999), transformational leaders raise the consciousness of followers about the importance of outcomes and how to reach those outcomes by going beyond their own self-interest. *Transformational leadership* occurs where leaders, among other things, stimulate interest among colleagues and followers to view their work from new perspectives, generate awareness of the mission or vision of the team and organisation, develop colleagues and followers to higher levels of ability and potential and motivate colleagues and followers to look beyond their own interests toward those that will benefit the group (Bass & Avolio 1994).

Problems remain, however, in identifying the theoretical rationale for the inclusion of these dimensions and differentiating among them; there is a degree of overlap between them and also some ambiguity in their nature (Yukl 1999). Yukl refers specifically to the dimension *providing individualised support*. This includes being friendly, helpful, considerate and appreciative of individual subordinates. Yukl argues that, due to this overlap and possible ambiguity, there is not a good rationale to include this as a core transformational behaviour. To overcome any problems that might arise in terms of collinearity, as well as in the interests of developing a more parsimonious model, this dimension is excluded from consideration in this thesis. Even though the four remaining dimensions were chosen as being most suitable for inclusion into the model, however, there remains evidence of high intercollinearity, especially when shortened variations of the scales are used (Bass 1999), as is the case in this thesis⁴¹.

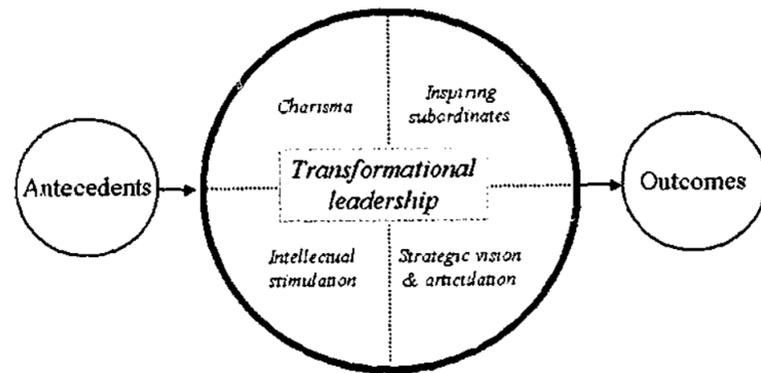
Thus, the four hypothesised dimensions for *transformational leadership* used in this thesis are those that fall within the title 'strategic leadership' and capture the type of leadership thought to bring about change. While they do not represent the entire spectrum of change leadership, they are thought to capture the variable adequately. They also appear to be most appropriate for principals of large state schools. Figure 3-5 contains a diagrammatic

problems and then act to correct them, the latter operating when leaders take an active role in monitoring and directing followers to achieve the goals of the organisation. *Laissez-faire* leaders avoid taking any action.

⁴¹ A discussion of the measurement of these scales is included in Section 4.4.3.

representation of the four dimensions of *transformational leadership* and shows where this variable fits into the model. A discussion of each of these dimensions follows.

Figure 3-5 Dimensions of transformational leadership



3.6.4 Charisma

Early theory relating to *charisma* described the way in which followers attribute extraordinary qualities to their leaders (Weber 1947). It originates as one of Bass' early conceptualisations of *transformational leadership* (Bass 1985, Bass 1990). It builds on the early work of Burns (1978, p. 23), who stated that charismatic leaders,

... excite and transform previously dispirited followers into active followers by heightening motivation and instilling a sense of purpose.

Charismatic leadership describes the ability of a manager to provide followers with a clear sense of purpose that is energising and is a role model for ethical conduct. Charismatic leaders differ from other leaders,

... by their ability to formulate and articulate an inspirational vision and by behaviours and actions that foster an impression that they and their mission are extraordinary (Conger et al. 1997, p. 291).

Charismatic leaders display pride, show confidence and emphasise a collective mission and trust (Avolio et al. 1999), as well as emphasising ideological aspects of the work and articulating an appealing vision for the organisation (House & Shamir 1993). Charismatic

leadership has its effects by strongly engaging followers' self-concepts in the interest of the mission articulated by the leader (Shamir, House & Arthur 1993).

3.6.5 Inspiring subordinates

A transformational leader is one who holds expectations of high performance of subordinates. Under this dimension of *transformational leadership* managers can motivate subordinates to make change happen (Conger & Kanungo 1987) and get followers to a higher level in their needs hierarchy (Pawar & Eastman 1997). They achieve this by inspiring their subordinates through demonstrations of their own confidence, pride, respect and trust (Bass 1990, Conger 1989) and communicating effectively with them (Conger & Kanungo 1988).

Within an education setting, inspirational behaviour exhibited by principals is thought to demonstrate their expectations for excellence, quality and high performance on the part of their staff members. Such behaviour on the part of the principal is thought to translate into leadership qualities that inspire transformation within the school (Leithwood & Jantzi 1997).

3.6.6 Intellectual stimulation

This dimension of *transformational leadership* captures the ability of leaders to encourage subordinates to approach their work with intelligence and to question the methods they use to improve them. Intellectual stimulation is displayed when the leader helps followers to become more innovative and creative (Bass 1999). They get followers to question the tried and true ways of solving problems. They encourage followers to improve upon their decision-making, thereby elevating the follower's level of maturity and ideals (Avolio et al. 1999).

Whereas other conceptualisations of *transformational leadership* include this dimension as part of *charisma*, for the purposes of this thesis, *intellectual stimulation* is included separately. The rationale for this approach is that it has been found that, within the school environment, leaders who demonstrate a transformational approach exhibit behaviour that challenges staff to re-examine some of the assumptions about their work and rethink how it can be performed (Leithwood & Jantzi 1997).

3.6.7 Strategic vision and articulation

This dimension captures the ability of a manager to foster development of vision and goals within the organisation. It corresponds with the 'charismatic leadership' dimension conceived in the Conger and Kanungo (1988) model. Key behaviours associated with this dimension include articulating an appealing vision, communicating high performance expectations and expressing confidence that subordinates can obtain them and emphasising collective identity (House 1977, Shamir *et al.* 1993).

This is demonstrated by the behaviour of the principal aimed at identifying new opportunities for his or her school, developing and articulating the vision that he or she has for the school and building consensus on school goals and priorities. Transformational leaders speak about these aims and objectives with subordinates on a continual basis (Leithwood & Jantzi 1997).

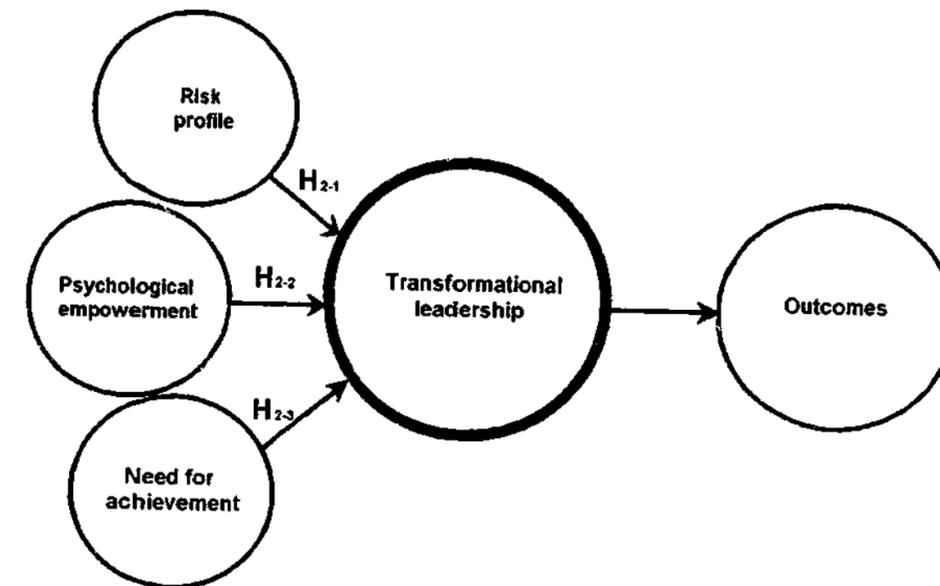
3.7 Influences on transformational leadership

The model developed in this thesis identifies three antecedents to *transformational leadership*; they are *risk profile*, *psychological empowerment* and *need for achievement*. The main focus in this thesis is on the role that *psychological empowerment* plays in the governance of state schools and its influence on *transformational leadership*. However, *risk profile* and *need for achievement* were included in order to minimise the possibility of specification error; this is the error that arises from omitting key variables from the model. A discussion on each of these antecedents is presented in turn. Figure 3-6 contains a diagrammatic representation of the way in which the three antecedents to *transformational leadership* are included within the model.

3.7.1 Risk profile

Risk is a characteristic of decisions defined as the extent to which there is uncertainty about whether potentially significant and/or disappointing outcomes of decisions will be realised. There are three dimensions of risk. They are outcome uncertainty (variability of outcomes), outcome expectations (gap between aspiration levels and expected outcomes) and outcome potential (magnitude of potential consequences) (Sitkin & Pablo 1992). It has been noted that attitude towards risk is a crucial factor in management decision-making (March & Sapiro 1987).

Figure 3-6 Antecedents to transformational leadership



Although there are many potentially relevant individual characteristics that determine attitudes to risk, Sitkin and Pablo (1992) identify three that have received attention in the literature. They are risk preferences, risk perceptions and *risk profile*. Risk preference is the likelihood that a person will undertake risky actions. Risk perception is a decision-maker's assessment of the risk inherent in a situation, leading decision makers to deny uncertainty, to overestimate or underestimate risks and to exhibit unwarranted confidence in their judgements. *Risk profile* has been conceptualised as an individual's risk-taking tendencies and is defined as the tendency of a decision-maker either to take or to avoid risks. It describes an individual's attitude toward risk across situations (Sitkin & Pablo 1992).

All three conceptualisations have been suggested as characteristics of individuals that influence their actions. However, of the three conceptualisations of risk, *risk profile* has been identified as most predictive compared with the traditional risk-preference variable because it contains both intellectual and motivational elements (Hogarth & Einhorn 1990). Decision makers who enjoy the challenge that risks entail will be more likely to undertake risky actions than those individuals who do not (Sitkin & Pablo 1992). It has been suggested that the preference for risk is stronger in some individuals than their desire to avoid failure and influence decision makers' behaviour (McClelland 1961).

It has been argued that certain individuals have a predisposition to taking or avoiding specific risks (Kogan & Wallach 1964) and hypothesised that the overall orientation of the individual would predispose some individuals (for example, entrepreneurs), to undertake more risks than others; for example, bureaucrats (Brockhaus 1980). Sitkin and Pablo (1992) hypothesised that decision makers who have been risk averse will continue in their cautious ways and risk-seeking decision makers will continue to be more adventurous.

It has also been suggested that risk preference is one individual characteristic that influences individual actions and that decision makers who enjoy the challenge that risks entail will be more likely to undertake risky actions than those individuals who do not (Brockhaus 1980). Individuals with high *risk profile* are willing to take risks with high stakes and become restless in stable, certain situations. Conversely, individuals with low *risk profile* attempt to minimise uncertainty and avoid high-stake problems (Lewin & Stephens 1994). Within the state education domain, principals with high-risk profile will be more likely to engage in transformational activities than those with low-risk profile. This leads to the following hypothesis.

Hypothesis 2-1: The high risk profile of state school principals is positively related to their level of transformational leadership.

3.7.2 Psychological empowerment

Research into the relationship between *psychological empowerment* and leadership has been relatively neglected until recently and, despite the organisational relevance of empowerment and its effects upon organisational effectiveness (McClelland 1975, Kanter 1983, Bennis & Nanus 1985), there is limited research that focuses on possible links between leadership and empowerment (Keller & Dansereau 1995). One of the chief contributions of this thesis is addressing this gap in theory.

Three basic commodities have been identified for managers that can be invested into innovative action and each of these commodities can be obtained within a 'market' (Kanter 1983). These 'markets' have been identified as a 'marketplace of ideas' (for information), an 'economic market' (for resources) and a 'political market' (for support or legitimacy). Where there is no market at all within an organisation and where these resources are tightly controlled within that organisation, little innovative behaviour is possible (Kanter 1983). Thus, in a changed environment following decentralisation initiatives, managers freed from organisational control, with greater feelings of *psychological empowerment* are more likely

to demonstrate characteristics of *transformational leadership* than otherwise. The reason is that a marketplace of ideas has been 'created', allowing for investment into innovative action.

The proposition underlying this hypothesis is that a leader is more likely to adopt a range of transformational characteristics if he or she feels empowered to do so. Leaders are more likely to act in a transformational manner if they feel free from the constraints of line management; that is, free from a perception of control by a senior manager. Atwater & Atwater (1994, p. 147) includes within the full-range model of leadership,

... the development of trust and empowerment of individuals to encourage them to demonstrate their abilities, develop new ones and seek unanticipated challenge.

Further, Yammarino (1994) identifies empowerment, along with communication and culture, as a key leadership facet that can be used to indirectly transform those who operate at a distance. In a field study, Spreitzer and Quinn (1996) found that middle managers with high levels of self-esteem (among other factors) were more likely to make transformational changes.

There is some evidence that empowered individuals are more likely to take a proactive approach toward shaping and influencing their work. *Psychological empowerment* reflects an active orientation to work and managers who possess characteristics of empowerment are also expected to possess change-oriented elements of leadership (Spreitzer & Quinn 1996). Supervisors who demonstrate high levels of *psychological empowerment* have been perceived by their subordinates as being more innovative, upward influencing and inspirational (Spreitzer *et al.* 1999). These characteristics exhibit correspondence with the dimensions of *transformational leadership* hypothesised here.

Summarising the effects of the individual dimensions of *psychological empowerment* on *transformational leadership*, the literature reveals that there is support for the following links. First, that high levels of *competence* tends to result in initiating behaviours, high effort and persistence in the face of obstacles (Bandura 1977). Second, that the converse of impact 'learned helplessness', dampens the ability to recognise opportunities (Abramson *et al.* 1978). Third, high levels of *meaning* are hypothesised to result in high levels of commitment, involvement and concentration of energy (Sjoberg *et al.* 1983). Fourth, that perceived choice (a concept related to *self-determination*) has been found to

produce flexibility, creativity and initiative (Bell & Staw 1989, Spector 1986). All of these outcomes suggest resonance with the dimensions of *transformational leadership*. If, indeed, *psychological empowerment* operates as a 'gestalt' of the four hypothesised dimensions as has been suggested (Spreitzer 1995a), it is anticipated that there will be empirical support for its influence on *transformational leadership*.

Organisations undertaking the flattening of management structures and elimination of middle-management positions have an increased need for more leadership at all levels (House 1995). In decreasing the size of its department of education in the 1990s through the implementation of *Schools of the Future*, the State Government of Victoria devolved decision making to those managers operating at the local school level; that is, its principals. Line management from regional managers to individual schools was severed and, as outlined in Chapter 2, there was an increased demand for strong leadership at the school level. Since a stated aim of the *Department of Education, Employment and Training* is that the *Schools of the Future* will improve learning outcomes, there is an implicit expectation for the type of leadership that facilitates and encourages change. Within this climate, the most appropriate type of leadership is that which is transformational.

The model proposes that school principals will be more likely to adopt *transformational leadership* characteristics if their perceptions of empowerment are high. They are able to take on these characteristics within the school-based management system since they are accountable only to the school council and are freed from the line management constraints of the central bureaucracy. Within this framework principals are free to adopt leadership characteristics that lead to the achievement of the strategic goals set out in their *School Charter*. Empowered principals are expected to demonstrate higher levels of *transformational leadership* than colleagues whose levels of *psychological empowerment* are not as high. This leads to the following hypothesis.

Hypothesis 2-2: The psychological empowerment of state school principals is positively related to their level of transformational leadership.

3.7.3 Need for achievement

Need for achievement has been used in the psychology literature to describe the personal striving of individuals to attain goals within their social environment. CEOs with a high *need for achievement* wish to ensure orderly and controlled progress toward their objectives, making decisions in an intentionally rational way (Miller, Dröge & Toulouse

1988). They consult frequently with other managers to improve their chance of success. It has been found, following a review of the literature, that six factors describe what might reinforce the achievement strivings of different individuals or of the same individuals in different situations (Cassidy & Lynn 1989). For the purposes of this thesis the most relevant of these factors are *pursuit of excellence* and *mastery*.

Pursuit of excellence is competition with a standard of excellence (McClelland *et al.* 1953) and high *need for achievement* is the single characteristic that best captures the motivations and personalities of business executives (McClelland 1961). Individuals with a high *need for achievement* are ambitious, hard working, competitive, have a need to improve their social standing and place high value on attainment. They tend to set attainable but challenging goals for themselves and take moderate, yet not excessive, risks. Most importantly for this thesis, they spend a great deal of time thinking about doing things better.

Mastery is a form of competitiveness, but not with other individuals. It evokes the reinforcing properties of problem solving, of tackling the difficult task and succeeding in the face of difficulty (Cassidy & Lynn 1989). High scorers on this factor probably adopt a problem-solving approach to life (Coyne, Aldwin & Lazarus 1981).

Managers who demonstrate high *need for achievement* on these two factors are expected to demonstrate high levels of *transformational leadership*. They will be motivated to achieve high levels of excellence and to strive for *mastery* of their roles through problem solving. This leads to the following hypothesis.

Hypothesis 2-3: The need for achievement of state school principals is positively related to their level of transformational leadership.

3.8 Influence on innovation in management structure

The purpose of this thesis is to explore the role that principals' *psychological empowerment* and *transformational leadership* play in the governance of their schools. Rather than modelling 'innovation' as a direct outcome of *psychological empowerment*, however, the model developed in this thesis represents *transformational leadership* as an intervening factor (*cf* Spreitzer *et al.* 1999). There has been some demonstration of the contribution of *transformational leadership* to criteria such as innovativeness and quality

improvement (Bass 1999). That is, more innovation is expected to occur in schools with principals who demonstrate higher levels of *transformational leadership*.

Innovation must be distinguished from other, similar concepts; specifically 'change' and 'creativity'. Organisations undertake change constantly, although the scope and nature of change varies considerably. According to Woodman, Sawyer and Griffin (1993), innovation is a subset of the broader variable of organisational change, while creativity, on the other hand is identified as a subset of innovation. Organisational creativity is not directly relevant to this thesis because it relates to the formation of something entirely new. It is defined as,

... the creation of a valuable, useful new product, service, idea, procedure or process by individuals working together in a complex social system
(Woodman *et al.* 1993, p. 293).

This thesis is not concerned with creativity in this sense of 'newness', because its focus is too narrow and restrictive. What is of interest in this thesis is the extent to which managers (school principals) implement procedures and processes that are new to the organisation, without the necessity of newness *per se*. Within the context of the thesis, interest lies in the extent to which principals introduce ideas, procedures or processes that are new to the school. Woodman, *et al.* (1993) argue that innovation can include the adaptation of pre-existing products or processes that have been created outside the organisation as well as those that have been created within. Innovation is therefore the most appropriate concept for inclusion in the model because of this broader conceptualisation. It is not restricted to initiatives that are generated as original ideas within the organisation and includes any process, idea or procedure that is new to the organisation. For the purposes of this thesis, the definition of innovation is adapted from that of Woodman, *et al.* (1993) as follows.

Innovation is the adaptation of products and processes that are new to the organisation that have been created both inside and outside that organisation.

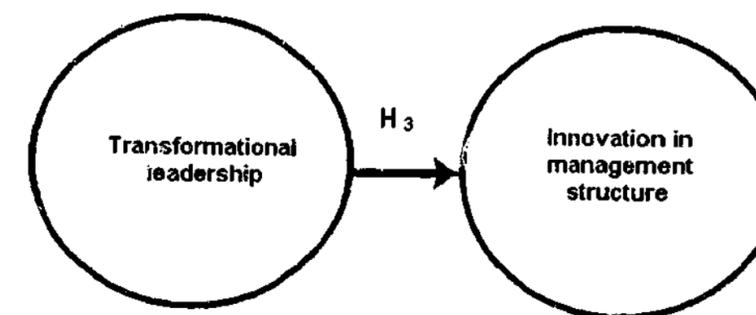
Innovation is seen as an essential element of competitive advantage and adaptation, as well as an essential ingredient for strategic rejuvenation (Wolfe 1994). Further, innovation for individuals and organisations represents a dramatic aspect of organisational change that,

... may provide a key to understanding change phenomena and, ultimately, organisational effectiveness and survival (Woodman *et al.* 1993, pp. 293-4).

The outcome factor for this thesis is *innovation in management structure* and is conceptualised to include all forms of management that result in innovation that is substantive and has the capacity to be observed clearly.

It has been proposed that creativity (and its overarching concept, innovation) is the complex product of a person's behaviour in a given situation (Weber 1947). That situation is characterised in terms of the contextual and social influences that either facilitate or inhibit creative accomplishment. In addition, there is a suggestion that CEOs can have a substantial effect on innovation by championing the assimilation of specific innovations (Meyer & Goes 1988) and a belief that *transformational leadership* is one of the important mechanisms that leads to organisational change (and therefore includes innovation) (Weber 1947). *Transformational leadership* brings about change through the articulation of the leader's vision, acceptance of that vision by followers and the creation of congruence between followers' self-interests and their vision. Transformational leaders create a dynamic organisational vision that often necessitates a metamorphosis in cultural values. This results in greater innovation, as well as a positive transformation of both the organisation and the organisational members (Pawar & Eastman 1997). Figure 3-7 contains a diagrammatic representation of the influence of *transformational leadership* on *innovation in management structure* within the model.

Figure 3-7 *Transformational leadership and innovation in management structure*



The stated aim of the *school-based management* is to improve learning outcomes for students in government schools (Caldwell 1998a). Without change and without innovation, however, improvements are not possible. Thus, the main outcome factor in the model for testing in this thesis is organisational innovation since this concept captures the

dynamics of change. It is therefore essential to understand innovation in management structure, to identify what it means and to define it operationally.

Internationally, educational institutions are experiencing significant levels of change as governments strive towards attaining high levels of education for their constituents. Caldwell (2000, p. 2) summarises the global consensus of governments, international institutions, UNESCO and the OECD in the following statement.

All students in every setting should be literate and numerate and should acquire a capacity for life-long learning, leading to successful and satisfying work in a knowledge society and a global economy.

Identifying common goals in this way, Caldwell (2000) sees these aspirations as the creation of 'world-class' school systems and 'world-class' schools⁴². He identifies nine domains for action for those who seek to lead world-class schools and each is considered as a field for innovation. They are curriculum, pedagogy, design, professionalism, funding, leadership, management, governance and the spanning of education, health and community. This thesis is concerned only with domains that are within the control of school principals. Therefore, the only relevant domains are those over which principals have control: curriculum, design, pedagogy, and management⁴³. There is ample scope for innovation within these domains and it is here that innovation for principals can be charted. These domains were considered in the *One World One School - Vision 2020* conference paper (Technology Colleges Trust 2000) where opportunities for innovation within them were identified. Despite the capacity for innovation of school principals, however, in the interests of parsimony only innovation in management structure is considered in this thesis.

It is important to have management structures in schools that facilitate the delivery of desirable educational outcomes to students. Traditional management structures emphasise exclusive hierarchies, while innovative management moves to the engagement of all members of the school community, including students, parents, school councillors, employers and the wider community. There is broad scope under *Schools of the Future* for

⁴² Caldwell distinguishes 'world-class' in this way in order to avoid the more elitist definition of 'world-class' in terms of 'best' schools identified by ranking student achievement.

⁴³ Leadership is not included as a domain for innovation since *transformational leadership* is modelled as an intervening variable within this thesis.

principals to initiate changes to traditional structures such as faculties and year levels and to move towards more innovative arrangements such as unit systems and project teams designed to facilitate individual student learning. Such movements away from traditional structures can provide the opportunity to release the creativity of all involved in the learning process. It is more effective than leaving power in the hands of those who have a vested interest in the *status quo* (Technology Colleges Trust 2000). Other innovations in management structure can include the following.

- Adoption of effective budgeting and accounting systems;
- broadening the traditional 9 am to 5 pm day to planning for lifelong, year-round learning;
- abandonment of meetings that are not geared to outcomes; and
- appropriate management of information technology for school management and learning.

Although there is scope for innovation in other aspects of school life (for example, curriculum, education design and student welfare), *innovation in management structure* is incorporated into the model since this is an aspect that is likely to be evident in an innovative principal early in his or her tenure. It is also one that is more easily detected and evaluated by personnel operating under the principal's leadership⁴⁴.

Innovative changes to management structures are thought to come about from principals demonstrating high levels of *transformational leadership*. This leads to the following hypothesis.

Hypothesis 3: The level of transformational leadership of state school principals is positively related to the level of innovation in management structure.

3.9 Improved organisational effectiveness

It is not the intention that this thesis seeks empirical support explaining schools' effectiveness in terms of learning outcomes. This is the case even though, in the final analysis, effectiveness is the measure upon which any school system or theoretical model is evaluated. It is widely accepted that there is pressure on managers of most organisations

⁴⁴ Assistant principals, rather than the principals themselves, were asked about their principals' innovation achievements.

to improve effectiveness and efficiency. However, these are broad concepts that are difficult to conceptualise and often more difficult to measure. Including effectiveness and efficiency in conceptual models is problematic. This is no less true within the province of education, where effectiveness relates to student learning outcomes and efficiency relates to minimising resources needed to achieve those outcomes. Learning outcomes for the students of a school result from a great many factors and it is difficult to identify all the factors that contribute to the effectiveness of a school. They include socio-economic status of students, pedagogical methods employed, attitude and ability of teaching staff, availability of resources and the ability of the leadership team to manage these resources. A study of educational effectiveness, moreover, falls more appropriately within the domain of education literature⁴⁵.

Thus, the question of whether innovative practices of a manager lead to improved efficiency or effectiveness of his or her organisation is difficult to determine. Problems for researchers include the inability to isolate the effects of a particular innovation on desired outcomes and the inability to identify (and measure) changes in these outcomes. A possible solution to the problem of identifying links between innovation and desirable management outcomes is for research to take place within particular organisations (for example, schools). In this way, those with research expertise in particular manufacturing and service organisations are better placed to resolve such issues. The purpose of the model developed in this thesis is to identify some of the key factors that lead to innovation in state schools. It seeks to determine whether there is any support for the proposition that the *psychological empowerment* of state school principals, in consort with their levels of *transformational leadership*, increases the innovative practices of those principals. It is the intention to investigate the effects of empowerment beyond this point. Indeed, investigation of the education literature on the question of whether changes in organisation or structure of state schools brings about improvements in student learning outcomes reveals that there is a level of scepticism on whether this is the case. Following a review of the literature on school-based management, it was suggested that a sub-text for the introduction of school-based management in many of the schools examined was to effect

⁴⁵ In summarising the results of a study of SBM, it has been stated that,

... significant improvements in student learning fundamentally depend on the widespread implementation of more effective teaching practices (Leithwood & Menzies 1998, p. 342).

financial savings (Leithwood & Menzies 1998), although there was a felt need to justify school-based management on educational grounds. Improvements in student learning outcomes fundamentally depend on the widespread implementation of effective teaching practices. Such implementation is a problem of teacher learning, not a problem of organisation or structure (Peterson, McCarthy & Elmore 1996).

Despite this uncertainty, however, the introduction of school-based management internationally is driven by the theory linking self-management with improvements in learning. In support of this, even though early research has found no evidence to support this link, recent studies have suggested that improvements have been made (Caldwell 2001). For example, a study carried out in Chicago found that, since the introduction of SBM, reading scores have improved (Lawton 1997). Following the introduction of school-based management in Victoria, Australia, school principals' have indicated a belief that there has been a moderate to high level of realisation of the expected benefit in respect to improved learning outcomes for students (Cooperative research project 1998).

Therefore, for purposes of completeness, the link between innovation in management structure and improved management effectiveness is included in the model (represented in Figure 3-2). The link will not be tested in this thesis, however. To indicate this intention, the arrow between innovation in management structure and improved management effectiveness is drawn with a double line. It falls outside the scope of the thesis.

3.10 Chapter summary

The purpose of this chapter is to present a set of hypotheses for testing. Hypotheses were developed from prior research on organisational change, leadership style and education administration. They are summarised in a model in Figure 3-2. The chapter begins with a description of empowerment, distinguishing 'psychological' from 'situational' empowerment, followed by a description of the model developed to summarise the key concepts and to specify their hypothesised linkages. Next follows a detailed description of each of the key concepts identified in the literature, as well as support for the hypothesised links between them.

The model is summarised as follows. The first part of the model hypothesises a conceptualisation of *psychological empowerment* (comprising four dimensions, *competence, impact, meaning* and *self-determination*) and five antecedent factors, *locus of control, role clarity, self-esteem, value of strategic information* and *availability of*

resources. The next part of the model describes the conceptualisation of *transformational leadership* (comprising four dimensions, *charisma*, *inspiring subordinates*, *intellectual stimulation* and *strategic vision and articulation*) and three antecedent factors, *risk profile*, *psychological empowerment* and *need for achievement* (comprising two dimensions, *mastery* and *pursuit of excellence*). The last part of the model hypothesises the link between *transformational leadership* and *innovation in management structure*. The link describing the relationship between *innovation in management structure* and *improved management effectiveness*, though identified in the hypothesised model, is not tested in this thesis.

A description of the research design used to test support for this theoretical framework empirically can be found in the following chapter, Chapter 4. It contains a description of the questions used to measure the variables presented in this chapter and a description of the method used to collect data.

Chapter 4

Research design and method

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Chapter 4

Research design and method

4.1 Introduction

The purpose of this chapter is to present a description of the method used to examine and identify empirical support for the theoretical framework developed in Chapter 3. It contains an outline of the research design, the development of measurement questions, the data collection procedures and design limitations. In examining a model that describes the relationship between *psychological empowerment*, *transformational leadership* and *innovation in management structure* (described in Chapter 3), this thesis seeks to,

1. Test the efficacy of the model by examining its goodness of fit; and
2. Test hypotheses that describe the relationships described in the model.

The remainder of this chapter is as follows. Next, Section 4.2 contains a discussion of methodology and a description of the research design. A description of the procedures undertaken to obtain and modify the measurement questions follows in Section 4.3 and Section 4.4 contains the measurement questions included in the survey forms. Section 4.5 contains a description of sample selection procedures. A discussion of the identification and treatment of missing data is contained in Section 4.6, and a description of the problem of outliers and the way in which they are treated is contained in Section 4.7. A discussion of normality is presented in Section 4.8. The demographic characteristics of the sample are described in Section 4.9 and analysis assumptions and limitations are presented in Section 4.10. The chapter concludes with a summary in Section 4.11. The following chapter, Chapter 5, contains a description of the statistical methods used to analyse the data.

4.2 Methodology and research design

The purpose of this section is to present a description of, and justification for the research design employed. A survey design was used to collect data for hypothesis testing. This was chosen as the most appropriate method in the light of the research question, which focuses on the development and testing of a model describing variables and their interrelationships. The final choice of design resulted from a trade-off between other design alternatives, including case studies and experiments.

The survey method refers to an investigation where,

- a) systematic measurements are made over a series of cases yielding a rectangle of data;
- b) the variables in the matrix are analysed to see if they show any patterns; and
- c) the subject matter is social (Marsh 1982, p. 6).

Survey designs involve many cases for which data are collected about the same specific characteristics. Statistical analyses determine patterns amongst these characteristics. Such designs include sampling techniques and empirical analyses that allow inferences to be drawn about the population of interest. Not only do they facilitate a better understanding of particular variables; they also provide some understanding of possible explanations of some phenomenon,

... by looking at variation in that variable across cases, and looking for other characteristics which are systematically linked with it (de Vaus 1991, p. 5).

By comparing the various characteristics of cases it is possible to draw causal inferences between variables⁴⁶. This method is preferred to the case study design since the assessment of the existence of patterns is not possible using only one, or even a few cases. This method is also preferred to the experimental design since variations in attributes of cases could not be created by intervention from a person conducting an experiment. It is preferred to the longitudinal study design due to the time constraints imposed upon doctoral students. For these reasons, therefore, the design of this thesis proceeded using the survey method.

4.3 Development of survey forms

Where possible, measurement items used to capture phenomena of interest were developed from validated scales found in the literature. Previous studies were conducted in a variety of settings, however, most often from organisations operating in the private sector. Therefore, since measurement questions were not always appropriate for Principal Class

⁴⁶ Care is necessary not to overstate causality, since data were collected contemporaneously.

Officers⁴⁷, these were appropriately modified to match the environment experienced by the raters.

Data used to test the model were collected using Likert scales (Likert 1967) to measure the psychological meanings of perceptions for individual Principal Class Officers. Likert scales have been found to communicate interval properties to the respondent and therefore produce data that are assumed to be measured on an interval scale (Konczak, Stelly & Trusty 2000). The bipolar rating scales used 7-point scales, anchored at one end of the scale with the label 'Very strongly DISAGREE' and the label 'Very strongly AGREE' at the other end of the scale. Respondents were asked to circle the appropriate number on the scale to show how much they agreed or disagreed with the statement. No label was used to describe the intervals in between. A copy of the survey forms can be viewed in Appendix A to this thesis.

4.3.1 Interviews and pilot study

Prior to the design of the survey forms, a small number of interviews took place in order to obtain evidence from a selection of Principal Class Officers on the relevance of the research questions. Interviews were undertaken with two school principals and three assistant principals. In addition, similar feedback was obtained from the 2001 president of the *Victorian Association of Secondary School Principals* (a former principal). All confirmed the suitability of the research framework and suggested modifications to the measurement questions.

In addition to the interviews, first draft copies of the survey forms for principals and assistant principals were sent to ten principals via email. These personnel were asked to complete the principal survey form and to hand the assistant principal survey form to an assistant principal for completion. Completed forms were returned independently via surface mail. In addition to completing the survey forms, respondents were asked to make written suggestions to enhance understandability of the questions for Principal Class Officers in general. Matched responses (from principals and their assistant principals) were received from seven schools, including one primary school and one primary to Year 12 ('P-12') school. Of these seven schools, two were located in the metropolitan area and

⁴⁷ The designation 'Principal Class Officer' is given to both principals and assistant principals within the *Victorian Department of Education, Employment and Training*. It distinguishes those holding management positions from teaching staff.

five were located in regional Victoria. For the purpose of the pilot study this was thought to provide good representation.

Following scrutiny of the responses received from the pilot study, the following adjustments were made in the development of the final survey forms.

- The number of points on the Likert scale was reduced from 9 to 7;
- some questions were re-worded to improve appropriateness for Principal Class Officers;
- some unnecessary questions relating to demographic characteristics were eliminated; and
- the order of the questions was changed to ensure that questions measuring the same variable did not appear within close proximity.

4.3.2 Survey forms

Since a high priority was given to maximising response rates (due to the relative complexity of the model), the maximum number of measurement questions used to measure each latent variable was restricted to four. In many cases, scales found in the literature contained many more than four measurement questions and inclusion of all of these for testing the model may well have resulted in inadequate response rates. The criteria used to identify questions for inclusion were as follows.

- Appropriateness of questions for the Principal Class Officers. For example, the question: 'My family expects too much of me' was omitted from the *self-esteem* scale because of the inappropriate nature of the question. Inclusion of such a question may have been perceived as intrusive and engendered some resentment on the part of principals;
- Questions that were similar in nature to other questions within the scale were omitted; and
- If a scale contained more than four questions, excess questions were eliminated following a ranking of 'appropriateness'.

'Response set bias' is the tendency of an observer to rate the majority of observees as, for example, above average regardless of their actual behaviour or capacity (Gay & Diehl 1992). To minimise response set bias, questions measuring the same variable were randomised across the survey. A related problem, the 'halo effect', is the tendency of a responder to let overall feelings toward a person or an organisation affect responses to individual items. To minimise the halo effect, at least one question from each set was negatively worded. Since questions obtained from the literature were worded positively,

negatively worded questions were developed for inclusion in the survey form⁴⁸. For the measurement of some variables, this was necessary since only three questions were available in the literature.

Common method variance is present when correlations that are observed do not indicate anything other than raters' consistency in responding to similar-sounding questions (Luzzo 1993). It arises when survey forms are used to gather data from one source for use as both dependent and independent variables. In order to minimise common method variance, questions relating to principals' perceptions (for example, *psychological empowerment*) were collected using a survey form administered to principals, while assistant principals completed a separate survey form designed to rate outcomes (for example, *transformational leadership*). Inspection of Table 4-1 reveals which group (principals or assistant principals) provided data for each of the variables⁴⁹.

4.4 Measurement questions

Questions contained in the survey forms were developed from a study of the literature (discussed in Chapter 3) and refined using a small number of interviews and a pilot study designed to ensure their suitability for administration to raters. This section contains the rationale for selecting the measurement questions used to quantify the variables contained in the hypothesised model. Measurement questions are presented immediately following the discussion relating to each. Appendix B contains a summary of the measurement questions included in survey forms, where questions measuring each latent variable are grouped together.

⁴⁸ These questions were reverse-coded for the purpose of statistical analysis.

⁴⁹ The perceptions of those who are subject to the *transformational leadership* qualities of principals are more relevant in assessing these qualities.

Table 4-1 Identification of respondents by variable

Variables	Principal	Assistant principal
<i>Dimensions of empowerment</i>		
• <i>Meaning</i>		
• <i>Competence</i>	YES	
• <i>Self-determination</i>		
• <i>Impact</i>		
<i>Antecedents to empowerment</i>		
• <i>Value of strategic information</i>		
• <i>Availability of resources</i>		
• <i>Locus of control</i>	YES	
• <i>Role clarity</i>		
• <i>Self-esteem</i>		
<i>Need for achievement (n-Ach)</i>		
• <i>Mastery</i>	YES	
• <i>Pursuit of excellence</i>		
<i>Risk profile</i>		
	YES	
<i>Transformational leadership</i>		
• <i>Charisma</i>		
• <i>Intellectual stimulation</i>		YES
• <i>Inspiring subordinates</i>		
• <i>Strategic vision and articulation</i>		
<i>Innovation in management</i>		
		YES

4.4.1 Dimensions of psychological empowerment

The scales for *psychological empowerment* were adapted from those developed, initially, by Spreitzer (1992). In selecting appropriate measurement questions, Spreitzer modified the measures encountered in the literature to improve construct validity, especially discriminant validity, since some of the original items related to more than one dimension of empowerment. Separate scales were used to measure each of the four dimensions of empowerment (*meaning, competence, self-determination and impact*) and questions were framed in the context of the respondent's role as school principal wherever appropriate.

In addition to the three items used by Spreitzer for each dimension, a negatively worded fourth item was added⁵⁰. The purpose of this procedure was two-fold. First, including such an item minimises the incidence of the 'halo effect' (described above in Section

⁵⁰ Negatively worded questions added to the scale are designated (R).

4.3.2). Second, inclusion of a fourth item ensured, as much as possible, that the final scale for each variable, following scale refinement, comprised at least three indicators. This allowed for the possible deletion of one item during the assessment of construct validity (refer to Chapter 5 for a discussion of tests of validity). A discussion of each of the measurement dimensions of *psychological empowerment* is presented in turn.

Competence

Three items adapted from Spreitzer (1992), reported a measure of reliability of 0.81 (Cronbach's alpha). The measures used by Spreitzer were adapted from Jones (1986), who reported a Cronbach's alpha of 0.71.

- *I am confident about my ability to perform my job as a school principal.*
- *My job as school principal is within the scope of my abilities.*
- *I am self-assured about my capabilities to perform my work activities as a school principal.*
- *I have not yet mastered the skills necessary for my job as school principal. (R)*

Impact

Spreitzer (1992) adapted three items from the helplessness scale developed by Ashforth (1989). This scale describes the cognitive inference that is drawn from powerlessness and reported a Cronbach's alpha reliability of 0.88. Ashforth reported a Cronbach's alpha of 0.87.

- *My impact on what happens in my school is considerable.*
- *I do not have much control over what happens in my school. (R)*
- *I have influence over what happens in my school.*
- *My opinion counts in decision-making within my school.*

Meaning

Three self-reporting items were adapted from Spreitzer (1992), reporting a Cronbach's alpha of 0.84. These items were developed from Tymon's (1988) measure of meaningfulness (Cronbach's alpha of 0.72) and from Hackman and Oldham's (1980) measure of *meaning* (Cronbach's alpha of 0.74).

- *The work that I do as a school principal is important to me.*
- *My job activities as school principal are not personally meaningful to me. (R)*
- *I care about what I do in my job as school principal.*
- *The work I do as a school principal is meaningful to me.*

Self-determination

Three items were adapted from Spreitzer (1992), who reported a Cronbach's alpha of 0.82. Hackman & Oldham's (1980) original autonomy scale produced a Cronbach's alpha reliability of 0.66.

- *I have autonomy in determining how I do my job as school principal.*
- *As a school principal, I can decide how to go about doing my work.*
- *I have little opportunity for independence and freedom in how I carry out my job as a school principal. (R)*
- *I use personal initiative in carrying out my work as a school principal.*

4.4.2 Antecedents to psychological empowerment

Scales developed in this section were designed to measure factors thought to influence psychological empowerment. Each is considered separately.

Locus of control

Locus of control is the variable developed initially by Rotter (1966). The 'I-E' scale contained in that study reflects the beliefs individuals have about who controls the key events in their lives: themselves or various other people, chance events or the government. People who perceive their lives to be controlled by their own actions, skills and abilities are said to be 'internals' (the 'I' end of the scale). At the other end of the scale are the 'externals' (the 'E' end of the scale) who perceive their lives to be controlled by external forces.

Despite the fact that the Rotter (1966) scale is the most widely used scale to measure *locus of control*, the scale used as a basis of measurement of *locus of control* in this study is the 'strategic locus of control' scale developed by (Hodgkinson 1992). This scale was adapted from that of Rotter specifically for investigating *locus of control* beliefs in relation to issues of strategic management (among other things). As noted by Phares (1976), the I-E scale is only a rough measure of the variable and researchers should develop their own context-specific scales. A further advantage of using the Hodgkinson (1992) scale as a starting point for this thesis is that items are domain-specific; they are not prone to correlate with social desirability. The scale contains both internally worded items and externally worded items and, in that scale, internally worded items were reverse-scored. This created a scale that measured 'externals' at the positive end of the scale and 'internals' at the negative end. All the scales were found to have high levels of reliability,

with Cronbach's alphas ranging from 0.70 to 0.88. The strategic *locus of control* scale showed a significant positive intercorrelation with both the Rotter (1966) and the Spector (1986) scales. In addition, the strategic *locus of control* scale demonstrated a low and nonsignificant correlation with the social desirability scale.

Thus, the instrument used to measure the *locus of control* of state school principals is adapted from the Hodgkinson (1992) 'strategic locus of control' scale. In contrast to the Hodgkinson *locus of control* scale, however, questions for *locus of control* in this thesis were framed in a positive way for internals and in a negative way for externals. In addition, items were re-worded to relate more closely to the state education environment.

- *Problems experienced by schools can be avoided through planning and analysis.*
- *Forces beyond its control shape the competitive environment in which my school operates. (R)*
- *Becoming a successful school is a matter of creating opportunities - luck has little or nothing to do with it.*
- *It is not wise to make strategic plans far ahead because many things may turn out to be a matter of good or bad fortune. (R)*

Role clarity

Role clarity was measured using a modified version of the scale developed by Rizzo, *et al.* (1970). The original scale for this variable contained a six-item measure of role ambiguity. However, this scale has been criticised on the grounds of the confounding effects of scale wording (Tracy & Johnson 1981) and attributional bias (Smits, McLean & Tanner 1993). The problem is that measurement items fail to distinguish clearly between role ambiguity and a related variable, role conflict. For the purposes of this study, items relating to role conflict were excluded since they do not have relevance for this thesis.

- *I feel certain about how much authority I have in my job as principal.*
- *I am not sure what my responsibilities are as principal. (R)*
- *I know what is expected of me in my role as principal.*
- *The explanation given to me concerning the role of principal is clear to me.*

Self-esteem

Self-esteem is defined as the general feeling of self-worth and typically refers to a global variable that taps individuals' self-evaluations (and not merely their confidence judgments) across a wide variety of situations (Brockner 1988). Four items, selected as the most

appropriate for school principals, were chosen from the 17-item 'true/false' scale developed by Coopersmith (1967) and adapted into seven-point Likert scales.

- *There are many things about myself I would change if I could. (R)*
- *Overall, things are all mixed up in my life. (R)*
- *I am popular with people my own age.*
- *As a person, I'm a lot of fun to be with.*

Value of strategic information

This variable was developed to measure two aspects of strategic information thought to influence *psychological empowerment*: they are the availability of the mission of the organisation to the manager and the provision of information relating to the achievement of goals set out in the mission. For the purpose of this thesis, both descriptions and measurement of this variable required modification since measurement for 'access to strategic information' used by Spreitzer related to middle managers of a *Fortune 500* company. Availability of information relating to the two aspects of strategic information for these managers was limited due to varying policies and attitudes that operated within those companies. Some managers had access to strategic information while others had limited, or no, access.

The situation for Victorian State school principals is different. As identified in Section 2.6, information relating to the school's mission is generated in the *School Charter* process and evaluation of the achievement of that mission is assessed in the *Triennial Review*. Interim information is provided via the school's *Annual Report*. Through these accountability processes, established as part of *Schools of the Future*, all school principals have access to this information. Measurement of this variable requires modification.

Thus, rather than measure the extent of the 'access to' strategic information a more appropriate approach was to measure the *value* placed upon this process by state school principals. In addition, since all principals have access to this information, the descriptor 'access to strategic information' is not appropriate and, due to the change in emphasis, a more appropriate label, *value of strategic information*⁵¹ was used.

- *I believe that the goals of the school, as set out in the School Charter, are appropriate signposts to success.*

⁵¹ See Section 3.5.2 for a discussion of this variable.

- *I value information that indicates whether the goals set out in the School Charter have been attained.*
- *The School Charter and Triennial Review are valuable events in the operating cycle of this school.*
- *I rely on the information fed back to me during the Triennial Review process.*

Availability of resources

A scale used to measure the perceived level of access to resources comprised three items, producing a Cronbach's alpha of 0.89 (Spreitzer 1996). Three items were adapted from this scale and included in the survey form sent to school principals along with one negatively worded question.

- *When I need additional resources to do my job, I can usually get them.*
- *I have access to the resources I need to do my job well.*
- *I can obtain the resources necessary to support the implementation of new ideas.*
- *Lack of resources is a barrier to proper management of my school. (R)*

4.4.3 Dimensions of transformational leadership

As referred to in Chapter 3, several theoretical models of *transformational leadership* have been proposed (Conger & Kanungo 1987, Conger 1989, House & Shamir 1993). According to Conger *et al.* (1997), little attention has been directed towards developing measures of the variable and identifying the specific distinguishing behavioural attributes of charismatic leaders in organisational settings empirically. As with *psychological empowerment*, *transformational leadership* is hypothesised as a multi-dimensional variable in this thesis (Bass 1985, Bass 1990, Bass & Avolio 1996, Avolio *et al.* 1999). In this thesis, *transformational leadership* is hypothesised as comprising four dimensions. They are *charisma*, *inspiring subordinates*, *intellectual stimulation* and *strategic vision and articulation*.

Charisma

- *The principal of my school displays power and confidence.*
- *The principal of my school emphasises the collective mission (School Charter).*
- *The principal of my school arouses awareness about important issues.*
- *The principal of my school talks of values.*

Inspiring subordinates

- *The principal has a capacity to excite people with a vision of what might be accomplished if they work together.*
- *The principal exhibits a capacity to get people to believe staff and students can overcome anything.*
- *The principal has a capacity to provide a source of inspiration for others within the school.*
- *The principal has a capacity to raise people to new levels of effort.*

Intellectual stimulation

- *The principal seeks different views about how the school should operate.*
- *The principal suggests new ways of doing things within the school.*
- *The principal encourages me to develop/review professional goals consistent with school goals*
- *The principal facilitates opportunities for staff to learn from each other.*

Strategic vision and articulation

- *The principal consistently generates new ideas for the future of the school.*
- *The principal is inspirational, able to motivate by articulating effectively the importance of what members of the school community are doing.*
- *The principal has vision; often brings up ideas about possibilities for the future.*
- *The principal is entrepreneurial; seizes new opportunities in order to achieve goals.*

4.4.4 Antecedents to transformational leadership

Within the model developed for this study, three factors are thought to influence a principal's level of *transformational leadership*. These are *psychological empowerment*, *risk profile* and *need for achievement*. *Need for achievement* is separated into two variables, *pursuit of excellence* and *mastery*.

Need for achievement

It has been said that high achievement motivation (*need for achievement*) is the single characteristic that best captures the motives and personalities of business executives McClelland (1961). Cassidy and Lynn (1989) identify *pursuit of excellence* and *mastery* as two of six of the factors that comprise *need for achievement*. These two factors are relevant for this study since they are hypothesised to relate most closely to the level of *transformational leadership* demonstrated by school principals.

Mastery

In a study of the factors that comprise *need for achievement*, Cassidy and Lynn (1989) used the following instrument to measure *mastery*. They identified, in two separate studies, Cronbach's alpha scores of 0.64 and 0.60.

- *If I were not good at something, I would rather keep struggling to master it than move on to something I can do easily.*
- *I would rather do something at which I feel confident and relaxed than something that is challenging and difficult. (R)*
- *I attempt tasks that I am not sure I can do more often than tasks I know I can do.*
- *I prefer to work in situations that require a high level of skill.*

Pursuit of excellence

In a study of the factors that comprise *need for achievement*, Cassidy and Lynn (1989) used the following instrument to measure *pursuit of excellence*. Three separate studies yielded Cronbach's alpha scores of 0.58, 0.65 and 0.55.

- *It is no use playing a game when you are playing with someone as good as yourself. (R)*
- *I get a sense of satisfaction out of being able to say I have done a very good job on a project.*
- *I find satisfaction in exceeding my previous performance even if I don't outperform others.*
- *Part of the satisfaction in doing something comes from seeing how good the finished product looks.*

Risk profile

Risk is a characteristic of decisions defined as the extent to which there is uncertainty about whether potentially significant and/or disappointing outcomes of decisions will be realised. *Risk profile* describes an individual's attitude toward risk across situations (Sitkin & Pablo 1992). The instrument used to measure *risk profile* is adapted from that used in Case and Scott (1998), who reported a Cronbach's alpha score of 0.84. The scale used in that study was adapted from the synthesis of organisational modes of decision-making (Khandwalla 1981, Khandwalla 1976, Mintzberg 1973). One measurement question was omitted from the Case and Scott (1998) instrument because it anchors one end of the scale to innovative or creative decisions. Its inclusion would compromise the criterion validity of this variable since other factors contain elements of innovation and creativity.

- *I undertake decision-making cautiously, seeking to minimise uncertainty. (R)*
- *I like to see decision-making that leads to dramatic changes in strategy taken in large, bold steps.*
- *Decisions I make are based strictly on realistic and objective cost/benefit assessment. (R)*
- *I make decisions that are characterised by enterprising spirit that thrives on risk.*

4.4.5 Management innovation

In recent years there has been much discussion about innovation in schools. Nine domains for innovation have been identified that will lead to 'world-class' schools (Caldwell 2000). Since this thesis is concerned only with individual-level factors, only four of these are relevant. They are innovation in four areas: curriculum, school design, pedagogy and management. Of these, however, only innovation in management is of relevance; the other dimensions are more appropriately considered in the education literature. Each is discussed separately, concluding with a question that provides a measure for the variable. Innovation is defined operationally in this study as follows.

Innovation is the adaptation of products and processes new to the organisation that have been created both inside and outside that organisation.

Innovation in management structure

Good management structures in schools enable teachers to deliver desirable educational outcomes. Within traditional systems (those that operated prior to the introduction of *Schools of the Future*) the role of the principal was to administer education within the school. There was little scope to interfere in the way the school was structured. For example, human resource management systems operated centrally and principals took no part in the hiring of teaching staff. This applied to the appointment of middle management ('senior teachers') as well as to the appointment of principals. Individuals were, in the main, appointed on the basis of seniority and the school principal had no control over the person employed to take up a vacancy. Following the introduction of *Schools of the Future*, however, principals were appointed on merit following selection procedures that operated at the local level. Once appointed, principals were free to structure middle management in the most appropriate manner. A principal might choose, for example, not to appoint an assistant principal, and instead devolve responsibilities to a number of middle-level managers. Another principal might choose to appoint a number of more

senior managers (for example, to assistant principal level) and to reduce the number of middle-level managers.

A school administration could be structured in a variety of other ways. For example, it could comprise sub-schools with an assistant principal in charge of each. In the case of a large regional Victorian secondary school, the Junior School comprises Year 7 students only; the Middle School comprises Years 8-10 students; and the Senior School is made up of students in Years 11-12. A middle-level manager and an assistant manager are in charge of administration in each of these units.

In short, principals of state schools under *Schools of the Future* now enjoy greatly increased powers to build appropriate, innovative management structures within their schools. The outcome variable, *innovation in management structure*, is measured using a single item included in the assistant principal survey form.

The school principal actively promotes innovation in management structures within this school.

4.5 Sample selection

4.5.1 The population

The research question calls for the study of the effects *psychological empowerment* and *transformational leadership* of principals of large state schools. The context chosen for testing this model is the Victorian *Department of Education, Employment and Training (DEET)*, where school principals have experienced organisational change following departmental decentralisation⁵². Only large schools are of interest for this thesis since small schools (those, for example, entitled to only one or two teachers) do not involve a complex system of management. The criterion determining the minimum size for the purpose of this thesis is whether the school is entitled to appoint an assistant principal according to the criteria determined by *DEET*.

Directories published by regional offices of *DEET* contain listings of the population of Victorian State schools. These directories typically contained the following descriptive data for each school.

⁵² A detailed description of this environment is contained in Section 2.6.

- School name, address and contact telephone number;
- Name of school principal; and
- Names of assistant principals.

Table 4-2 contains a description of the population of schools included in the study, identified by membership of each of the *Department of Education, Employment and Training's* nine regions. It contains total numbers of schools in each region, as well as the number of schools large enough to employ an assistant principal.

Table 4-2 Population of schools (by region)

Region	Total number of schools	Population (schools with an assistant principal)
Barwon/South-West	152	95
Central Highlands/Wimmera	132	48
Eastern Metropolitan	277	200
Gippsland	167	64
Goulburn/North-Eastern	183	73
Loddon Campaspe Mallee	164	77
Northern Metropolitan	200	156
Southern Metropolitan	276	211
Western Metropolitan	148	127
Totals	1699	1051

4.5.2 The sample (census)

An important consideration for the design of this study was the high number of responses required for testing of the hypothesised model, given its relative size and complexity, using structural equation modelling. In addition, the required number of responses was determined by the extent of nonnormality in the distribution of responses. This factor influences the choice of estimation procedure employed in determining model fit which, in turn, determines the minimum sample size (Hair *et al.* 1998). Although there is no absolute standard in the SEM literature about minimum sample size, an heuristic offered by Kline (1998) suggests that a desirable goal is to obtain a ratio of cases to model parameters of 20:1. Since the structural model consists of 20 parameters, (see Section 7.4 for a description of the structural model), a sample size of matched 500 responses was

considered to be adequate⁵³ using maximum likelihood estimation. Using weighted least squares estimation, however, the required sample size increases to 5,000.

Given the small number of *DEET* schools of adequate size, a census (rather than a sample) survey was employed to collect the data for testing. With a census, an attempt is made to acquire data from each member of the population. Such an approach is deemed appropriate in situations where a population is relatively small and readily accessible (Gay & Diehl 1992). A census survey design was chosen for this thesis for the following four reasons.

1. The population of large *DEET* schools (1,051 in total) is not large enough to allow selection of a sample of adequate size;
2. The population of appropriately sized schools is contained within the geographical boundaries of the State of Victoria, is clearly identifiable, is easily accessible and is large enough to produce an adequate number of replies; and
3. A supporting letter for the research project was obtained from the president of the Victorian State School Principals, increasing the possibility of obtaining a large response rate.

Consequently, following the granting of ethics approval from relevant committees within the *DEET* (Approval Number SOS001284) and La Trobe University⁵⁴, 1,051 survey forms were sent to the population of principals of large *DEET* schools. Each principal received a kit⁵⁵ containing the following.

- A letter of introduction, explanation and instruction;
- a pre-numbered principals' survey form (buff coloured, with blue printing);
- an addressed, reply-paid envelope;

⁵³ For a more comprehensive discussion on the topic of sample size, especially as it relates to structural equation modelling, refer to Section 5.2.5.

⁵⁴ Following transfer of enrolment from La Trobe University to Monash University, ethics approval was transferred to Monash University (Approval Number 2002/486MC) on completion of all appropriate procedures.

⁵⁵ Copies of survey forms can be viewed in Appendix A, while copies of all documents included along with survey forms are reproduced in Appendix C.

- a letter of support for the study from the incumbent president of the *Victorian Association of Secondary School Principals (VASSP)*; and
- an envelope containing a kit to be passed on to the assistant principal (unsealed to allow examination by the principal).

The kit for assistant principals contained the following.

- A letter of introduction, explanation and instruction;
- a pre-numbered assistant principals' survey form (green coloured, with black printing);
- an addressed, reply-paid envelope; and
- a copy of the letter of support for the study from *VASSP*.

Some measurement items required responses from the principal, while others required responses from the assistant principal. Consequently, matched pairs from principal and assistant principal were required from each school in order for a complete response set for that unit. To enable matched pairs to be identified, the principals' and assistant principals' survey forms for each school were coded with the same number. This coding procedure was undertaken for matching purposes, and to assist with follow-up procedures only. As identified in the applications for ethics approval, care was taken to protect confidentiality of responses. Addressees were assured of confidentiality in covering letters.

The initial mail-out of survey forms to principals occurred on Friday 16 March 2001. By 13 April 2001, 300 matched pairs were returned, as well as a further 170 single responses from principals and 204 from assistant principals. Focusing on the single responses only, on April 16, reminders were sent to the 170 assistant principals and 204 principals who had not responded in the initial round⁵⁶. Each reminder envelope contained the following.

- A reminder letter;
- an appropriate (principal or assistant principal) survey form, pre-numbered to match the original number assigned to the school; and
- a reply-paid envelope.

⁵⁶ Reminders were not sent to schools from which no response had been received since the possibility of receiving paired responses from them was thought to be much lower.

4.5.3 *Unusable and unmatched responses*

In a large investigative study such as this there is an expectation that some survey forms returned will be unusable. In all, five responses were unusable due to the addressee having retired, transferred or being in some other way unavailable. An additional two responses were unusable since the schools were not large enough to have an assistant principal (as explained in returned envelopes).

In total, 621 responses were received from principals, (58.97% of the population). Of these, however, 82 were from schools whose assistant principal had not responded, leaving 539 matched pairs (51.3% of the population). Unmatched responses were excluded from data analyses.

4.6 **Missing data**

The problem of missing data arises for a number of reasons, including a failure to respond, the inability of addressees to be contacted and the failure of responders to return complete survey forms. The purpose of this section is to explain the types of problems experienced, to identify the extent of these problems and to describe the manner in which problems were treated.

4.6.1 *Non-response*

Non-response arises because, for one reason or another, addressees do not return survey forms. Two problems associated with non-response are inadequate sample size and bias (de Vaus 1991).

Adequate sample size

The adequacy of sample size was addressed in two ways. First, data collection techniques were designed to reduce non-response. Second, drawing a sample size that was larger than necessary to perform statistical analyses ensured that an adequate number of responses was collected.

The question of adequate sample size is one for which there is no clear answer when it comes to statistical analysis, especially when multivariate analysis (including structural equation modelling) is to be performed. Four factors are identified as determining sample size requirements for structural equation modelling (Hair *et al.* 1998). They are model misspecification, model size, departures from normality and the estimation procedure employed. These four factors are discussed in Chapter 5. Nonetheless, the larger the data

set collected, the more statistical power that will be obtained for the multivariate analyses to be employed (Cohen & Cohen 1983).

In order to achieve the number of survey returns necessary to test the model, the number of responses required from each respondent was kept to a minimum. This was achieved by limiting the number of items for each of the latent variables to four and limiting the size of the survey to a maximum of four pages. The purpose of this decision was to minimise survey fatigue (the failure of addressees to complete survey forms because of the perception that they contain too many items). Other procedures undertaken to maximise response rates, as proposed by de Vaus (1991), were as follows.

- Use of official (La Trobe University) letterhead for the cover letters and survey forms;
- inclusion of the date on which the survey form was mailed;
- the full names and addresses of the addressee (as detailed in the *Regional Directories of DEET*);
- an explanation of the study's purpose and usefulness;
- an assurance of confidentiality and a brief explanation of the purpose of the identifying number on the survey form, indicating that these numbers would not compromise confidentiality;
- an offer to answer any questions that might arise;
- an indication of what would be done with the results and an offer to make the results available; and
- an indication of the position of the researcher as well as that of the research supervisor.

An added procedure employed to maximise the number of returns was to include a letter of support for the research project, written and signed by the president of the *Victorian Association of Secondary School Principals*. It was thought that this letter, along with references to the ethical clearances from both La Trobe University and the Victorian *Department of Education, Employment and Training*, would act to maximise response rates by adding legitimacy and credibility to the research project.

The second problem associated with non-response, that of non-response bias, arises from the possibility that respondents who have not returned the survey form have crucially different views from those who have responded (de Vaus 1991). The proportion of non-

respondents for this study is 41%, a relatively low rate for a study of this size, especially given that the survey is a census and not a sample⁵⁷.

A review of the demographic characteristics of non-respondents failed to identify any factors that might indicate cause for concern regarding non-response bias. Nonetheless, a test that indicates the extent of non-response bias compares the responses of the early respondents with the respondents who were late with their responses (Armstrong & Overton 1977). This test suggests that significant differences between the means (and to a lesser extent, variances) of variables could give some indication of non-response bias. This method is based on the assumption that subjects who respond less readily are more like non-respondents. The term 'less readily' is defined as 'answering later, or requiring more prodding to answer' (Armstrong & Overton 1977).

For this thesis, the last 10% of respondents to remit their returns were compared with the first 10% using a *t*-test for equality of means and Levene's test for equality of variances (Hair *et al.* 1998). For each case, Levene's test computes the absolute difference between the value of that case and its cell mean and performs a one-way ANOVA on those differences.

Table 4-3 contains the statistics describing the observed variables that indicate significant differences in variance and/or means. Observation of this table reveals that there is no significant difference in means between the first and last 10% of responses received, although there were three variables with significant differences in variances (statistics in bold italics identify significant scores). Observation also reveals the existence of no more than one item with a significant difference in variances for any latent variable. Following the creation of composite variables, therefore, the effect is minimal. Although this is but one indication that the sample is representative of the population, it was assessed as adequate for the purpose of this thesis.

In addition to this statistical procedure to determine the existence of non-response bias, records of other responses from schools whose Principal Class Officers did not return survey forms were examined. Included amongst these were letters, emails and telephone calls from principals and school secretaries, giving reasons for the failure to provide responses. Most referred to time constraints as reasons for failing to return completed

⁵⁷ This proportion increases if single (unmatched) responses are included in the calculation.

survey forms and none gave indications that they would have provided vastly different responses from those who did respond. However, there is no way to identify whether non-respondents would have differing views, and some non-response bias may remain.

Table 4-3 Differences: First and last 10% of survey forms received

Observed variable	Levene's Test (equality of variance)		t-test (for equality of means)			
	F	Significance (2-tailed)	t	Significance (2-tailed)	Mean Diff.	St. Error Diff.
INFO2	9.416	.003	.545	.587	.13	.24
LOC1	6.272	.014	-1.211	.229	-.31	.26
ROLCLAR1	4.811	.030	-1.047	.298	-.24	.23

Table 4-4 contains the items attaching to the variables identified in Table 4-3. Observation of this table reveals no discernable pattern or commonality amongst these questions that provide an explanation for the differences in variance.

Table 4-4 Measurement questions underlying variables (items identified in Table 4-3)

Variable name	Item
INFO2	I have information that indicates whether the goals set out in the School Charter have been attained
LOC1	Problems experienced by schools can be avoided through planning and analysis
ROLCLAR1	I feel certain about how much authority I have in my role as principal

Taking a broader view of the question of non-response bias, there is no reason to suspect that non-respondents differ significantly in their responses from those who submitted the survey forms. A number of factors increase the level confidence that data collected are representative of the population. First, data were collected using a census survey; second, the rate of responses was high; third, four principals who indicated (by telephone, mail or

email) that they were unwilling to participate in the survey indicated that this was due to work pressure on them and their staff⁵⁸.

4.6.2 Missing value analysis

This section contains a description of missing value analysis, its implications and remedies. Observations missing from the data set arise because of the failure of respondents to complete all questions in the survey form. The first step in undertaking this analysis is to determine the extent of the problem. If there is evidence of missing values, an assessment is made as to whether the missing variables are ignorable and whether the omitted observations can be accounted for through sampling error in the statistical procedures (Little & Rubin 1987). If missing values are ignorable, it is acceptable to employ data replacement techniques that estimate valid values for missing values. This approach is preferred because it minimises the loss of cases from the analysis. To assess the randomness of missing data and whether data were missing 'completely at random' (MCAR), the 'expectation maximisation replacement' method was used. If this test is satisfied, the values for all missing variables represent a truly random sample, with no underlying process that lends bias to the observed data. If the missing responses are MCAR, then the problem is ignorable and any of the available missing data remedies can be applied without making allowances for the influence of any other variable or missing data process (Little & Rubin 1987).

Table 4-5 contains the results of an analysis of the percentage mismatch of indicator variables. The diagonal elements show the percentages missing and the off-diagonal elements show the mismatch percentages of indicator variables. Indicator variables with less than 1% missing values are not displayed. Observation of this table reveals no variable with more than 5% missing values. The highest percentage of missing values for any one item (EXCEL1⁵⁹) was 4.3% (a total of 23 missing values) and the next highest percentage of missing values was 1.7% (9 missing). Further, Little's MCAR test produced a chi-square value of 6,205, with 6,246 degrees of freedom and a significance level of 0.648 (Little & Rubin 1987). The non-significance of this test indicates that there is no

⁵⁸ Since none of these issues (job satisfaction or work-related stress) relate to factors in the hypothesised model, this is no indication of the existence of nonresponse bias relating to survey questions.

⁵⁹ This item reads, 'It is no use playing a game when you are playing with someone as good as yourself.' It is an item that produced a number of written comments from principals questioning the relevance of the item.

non-random missing data process operating within the sample. Thus, in both absolute and relative terms, it is determined that the extent of the problem does not jeopardise the thesis and the assumption is that data are missing completely at random.

Table 4-5 Percentage mismatch of indicator variables

	1	2	3	4	5	6	7
RESOURC2	1	1.30					
MASTER2	2	2.42	1.49				
SLFEST3	3	2.60	2.79	1.30			
ROLCLAR4	4	2.79	2.97	2.42	1.49		
MASTER1	5	2.97	3.16	2.60	2.79	1.67	
INTELL3	6	2.97	3.16	2.97	3.16	3.35	1.67
EXCELI	7	5.58	5.76	4.83	4.28	5.20	5.95
							4.28

Of the remedies available for the replacement of data, the all-available imputation approach was used, a system that imputes the obtained correlations as representative for the entire sample using the expectation maximisation method (Little & Rubin 1987). This method estimates missing values using multiple linear regression and adds chosen-randomly error terms to the observed residuals of completed cases. Use of this regression replacement method may lead to heteroscedastic error variances or to non-normal distributions of the now complete data, even though incomplete data were normally distributed (Schumacker & Lomax 1996). The assessment and treatment of the normality of the distributions are considered in Section 4.8.

4.7 Outliers

It is common for sample data to include one or more extreme observations, referred to as 'outliers'. Outliers, if not detected, can affect the results in structural equation modelling (Schumacker & Lomax 1996). Four classes of outliers have been identified (Hair *et al.* 1998). They are as follows.

1. Those arising from procedural error;
2. those arising as a result of an extraordinary event;
3. those for which the researcher has no explanation; and

4. those that fall within the ordinary range of values on each of the variables but are unique in their combination of values across the variables.

The first three of these classes is not relevant to the analysis of outliers for this research project. Procedural errors were corrected at the time of data entry, there was no extraordinary event at the time of data collection and there is no outlier with a magnitude for which there is no explanation (all measurement questions for hypothesis testing were measured using Likert scales in the range 1 to 7). Only the fourth class of outliers has the potential to cause concern in this thesis. Nonetheless, outliers should be retained unless specific evidence is available that discounts them as valid members of the population (Hair *et al.* 1998). In identifying outliers of this type, however, the Mahalanobis D^2 measure provides a diagnostic to assess multivariate outliers. It evaluates the position of each observation compared with the centre of all observations on a set of variables (Hair *et al.* 1998). A problem exists if a small set of observations has significantly higher Mahalanobis Distance values than the remaining observations (the recommended level of significance is $p < 0.001$). An examination of the data set of the 539 usable responses reveals no observation indicating cause for concern in this respect.

4.8 Univariate normality

Hypotheses in this thesis are tested statistically using structural equation modelling (SEM), a multivariate data analysis technique discussed in Section 5.2. Univariate normality concerns the distributions of individual variables, with skew and kurtosis being two ways in which the distribution can be non-normal. Assessment of non-normality is essential, since the validity of certain estimation techniques used in structural equation modelling (for example, maximum likelihood) does not hold under excessive skewness or kurtosis. Such estimation techniques generally assume normality of the data distribution (Hoyle & Panter 1995). Therefore, tests of normality of individual variables used in this thesis were undertaken to assess the extent to which the data distribution conformed to acceptable levels of univariate normality.

In undertaking tests of skewness, reference was made to the calculation of absolute values of skewness and kurtosis provided by SPSS (Norusis *et al.* 1993). Identifying acceptable cut-off values in assessing these characteristics is difficult, with few clear guidelines on levels of acceptability. It has been suggested, however, that data sets with absolute values of univariate skew indexes that exceed 3 are described as 'extremely' skewed (Kline 1998). Referring to kurtosis in particular, Kline suggests that values ranging from 8 to

more than 20 can be described as exhibiting extreme kurtosis. Since SEM is to be used for statistical analysis and hypothesis testing, where variables are in excess of the acceptable limit in terms of skewness and kurtosis, they should not be included in this analysis.

Table 4-6 contains normality statistics for all items that exceed the criteria identified above, Table 4-6a containing items with highest signs of skewness and Table 4-6b containing items with the highest signs of kurtosis. Observation of this table reveals that only one item produced a skewness statistic that exceeds the criterion. The item is Item 3 on the *meaning* scale (skewness -5.517: 'I care about what I do in my job as school principal'). Three other items producing the highest skewness scores are also included in the table. They are Item 2 on the *role clarity* scale (skewness -2.246: 'I know what is expected of me in my role as principal'), Item 2 on the *meaning* scale (skewness -2.211: 'My job activities as school principal are not personally meaningful to me') and Item 4 on the *meaning* scale (skewness -2.161: 'The work I do as school principal is meaningful to me'). All other remaining items satisfied tests of normality. With regard to kurtosis, only three items returned statistics that exceeded the cut-off criterion of 8 and two of these exceeded the criterion only marginally. Two of these items were measures of *meaning* (Item 3: 58.604 and Item 4: 8.658). The only other item to produce a kurtosis in excess of 8 was Item 4 of the *impact* scale (kurtosis 8.964: 'My opinion counts in decision-making within my school').

Thus, of a total of 46 items in the sample data, only one produced statistical tests of skewness that exceeded acceptable criteria. The same item produced an unacceptable level of kurtosis. Three of these items measured the *meaning* variable and further examination of this variable, at a statistical and theoretical level, is contained in the discussion on CFA in Section 5.5.2. The other indicators, Item 2 of *role clarity* (skewness -2.246, kurtosis 5.479) and Item 4 of *impact* (skewness -1.846, kurtosis 8.964) produced kurtosis statistics only marginally in excess of the acceptability criteria, with skewness statistics falling within acceptable limits. Kurtosis for these items could be absorbed at the multivariate level following summation. Discussion of multivariate normality is contained in Section 7.3.

Table 4-6 Items with high levels of non-normality

4-6a Items with highest levels of skewness

	MEANING3	ROLCLAR2	MEANING2	MEANING4	IMPACT4
Skewness	-5.517	-2.246	-2.211	-2.161	-1.846
Kurtosis	58.604	5.478	6.468	8.658	8.964

4-6b Items with highest levels of kurtosis

	MEANING3	IMPACT4	MEANING4	MEANING1	MEANING2
Skewness	58.604	8.964	8.658	6.923	6.468
Kurtosis	-5.517	-1.846	-2.16	-1.795	-2.211

From a theoretical perspective the negative skewness is not surprising, especially given the environment from which the sample was taken. School principals, as professional teachers, are members of the 'helping' or 'caring' professions and it is expected that their perceptions of the meaningfulness of their role would be negatively skewed (that is, weighted towards the higher end of the scale)⁶⁰. This accounts for the high levels of nonnormality reported for the *meaning* scale across all four of the indicators and it is not surprising that the distribution of this variable is strongly negatively skewed. However, the resultant high levels of non-normality make *meaning* unsuitable for analysis using SEM. As a result, the *meaning* variable was eliminated from further consideration in this thesis.

However, it should be understood that elimination of this variable from empirical analysis does not indicate that *meaning* does not play an important role in the conceptualisation and measurement of *psychological empowerment*. Rather, it means that, for the purpose of measuring *psychological empowerment* using the data collected for this thesis, the *meaning* dimension cannot be measured reliably.

4.9 Demographic characteristics of the sample

By June 4 2001, responses were obtained from 731 schools, representing 69.55% of the

⁶⁰ Refer to Chapter 2 for a discussion of the state education environment.

population of schools large enough to employ an assistant principal. This produced a total of 1,263 out of a possible total of 1,462 responses from Principal Class Officers⁶¹; it represents 86.39% of the total population. However, for this thesis, only matched responses (responses from the principal and assistant principal from the same school) were of interest⁶². In all, 539 matched pairs were received, representing 51.28% of the population. In terms of both absolute numbers and relative response rates, this was thought to be adequate, given the number of parameters in the most complex of the models (refer to Section 5.2.5 for a discussion of adequate sample size). Appendix D contains tables of statistics that describe the demographic characteristics of the sample and population for principals, assistant principals and schools.

4.9.1 Profiles of principals

Principals were aged between 31 and 64 years, with an average age of 50.05 years. On average, principals held their positions for an average of 7.63 years and had been teaching for 28.79 years. 69.6% of principals were male and 30.1% were female (3% did not respond to this question). 16.7% of principals were educated to diploma level, 38.5% had bachelor degrees, 26.1% had graduate diplomas, 17.1% had master degrees and 1% were educated to doctoral level. 17.4% of principals had a background in arts/humanities, 12.7% in mathematics, science and technology, 56.7% had a generalist primary background, 4.5% were specialist education teachers and 6.9% were grouped as 'other' (including commerce and physical education). 32.57% of principals indicated that they possessed formal qualifications in administration.

4.9.2 Profiles of assistant principals

Assistant principals were aged between 32 and 64 years, with an average age of 47.95 years. On average, assistant principals had spent 4.95 years as an assistant principal and 25.44 years as a teacher. 262 (48.6%) of assistant principals were male and 274 (50.8%) were female. 25.0% of assistant principals were educated to diploma level, 48.8% had bachelor degrees, 16.5% had graduate diplomas, 8.9% had master degrees and 0.6% were

⁶¹ Recall that the term 'Principal Class Officer' refers to the class of teachers who hold the position of either Principal or Assistant Principal.

⁶² Single responses (unmatched) were received from 82 principals, while single responses from assistant principals totalled 107. These unmatched responses were not included in the statistical analysis.

educated to doctoral level. Of assistant principals, 7.4% had a background in arts/humanities, 13.4% in mathematics/science and technology, 53.2% had a generalist primary background, 4.3% were special education teachers and 11.7% were grouped as 'other' (including commerce and physical education). Unlike principals, assistant principals were not asked about their formal qualifications in administration. This study concerned only with principals' management characteristics.

4.9.3 Profiles of schools

Demographic data relating to schools in this section is summarised from the total number of responses from principals, a total of 539. 340 (63.1%) schools represented in the sample were primary schools, 154 (28.6%) were secondary schools, 28 (5.2%) were combined primary and secondary (P-12) schools and 15 (2.8%) were specialist schools. By *Department of Education, Employment and Training* region, 52 (9.6%) schools were from the Barwon South-West, 31 (5.8%) from Central Highlands Wimmera, 96 (17.8%) from Eastern Metropolitan, 69 (12.8%) from Northern Metropolitan, 97 (18.0%) from Southern Metropolitan, 59 (10.9%) from Western Metropolitan, 38 (7.1%) from Gippsland Region, 50 (9.3%) from Goulburn North-Eastern and 45 (8.3%) were from Loddon Campaspe Mallee. 217 (40.3%) of principals identified their schools as 'rural', while 320 (59.4%) identified their schools as 'metropolitan'. On average, schools had 465 students, ranging from 22 to 1,832. The number of teachers ranged from 1 to 130, with an average of 31.6. The average size of the global budget for the schools (of those who provided this information) was \$2.9 million, ranging from \$920 to a maximum of \$13 million.

4.10 Analysis assumptions and limitations

The research process involves making compromises and this study is no exception. The inevitability of compromise means that certain limitations are placed upon the final product. The survey method was chosen⁶³ for this study since it appeared to be the most appropriate, given the research question. A case study would have resulted in a much more detailed and richer examination of the research question, whereas an experimental design would have resulted in findings that would be more generalisable than the other methods. However, the other methods available also have their disadvantages when

⁶³ Following an evaluation of competing methods available to social scientists (case studies and experiments). See a discussion of methodology in Section 4.2.

compared with surveys. Case studies are used to develop theory rather than to test an existing theory, while experiments are appropriate for questions relating to internal validity (confidence that the changes in the endogenous variable can be attributed solely to variations in the exogenous variables). Thus, method selection itself involves compromise, resulting in limitations to the study. For example, use of highly structured items necessarily limits the extent to which respondents are able to express their true, underlying beliefs.

The number of items used for each latent variable was limited to four. This compromise limited the size of the survey form, maximising the chances of a high response rate. However, the trade-off for this decision was to compromise, in some situations, the internal validity of the measurement of latent variables.

4.11 Chapter summary

The purpose of this chapter is to present a description of the research design for the thesis. In particular, the subjects of the research, the measurement instruments used, the design of the study, its assumptions and limitations. The next chapter, Chapter 5, contains a discussion of the procedures undertaken to test the scale reliability and validity.

Chapter 5

Methods of statistical analysis

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Chapter 5

Methods of statistical analysis

5.1 Introduction

The purpose of this chapter is to present a summary of the aims and processes of statistical analyses undertaken to test the hypotheses. The tool used for data analysis is structural equation modelling (SEM) and this chapter contains an outline of the role it plays in the testing process. The chapter also includes descriptions of tests used to determine whether the data are suitable for SEM testing, including tests of normality, multicollinearity and reliability. The previous chapter contains an outline of the research design and data collection procedures.

SEM in this thesis is undertaken as a two-stage process. SEM is first used to test measurement models for unidimensionality using confirmatory factor analysis (CFA) and is applied to first-order and second-order measurement models. Second, SEM is used to test the structural model that describes hypothesised causal relationships between latent variables. This chapter contains a description of these processes. The following two chapters contain descriptions of the results of hypothesis testing of the measurement models and the structural model.

The remainder of this chapter is set out as follows. Section 5.2 contains a general description of SEM, its capabilities, processes and its use in this thesis. Section 5.3 contains a description of the CFA testing of measurement models and Section 5.4 contains a discussion of the structural model. This is followed, in Section 5.5, with a discussion of the limitations of the statistical analyses used and the chapter concludes with a summary in Section 5.6.

5.2 Structural equation modelling

Structural equation modelling (SEM) is a multivariate technique combining aspects of multiple regression and factor analysis to estimate a series of interrelated dependence relationships simultaneously (Hair *et al.* 1998). It is appropriate for use for statistical analysis in this thesis since the hypotheses are expressed in terms of a series of dependence relationships linking various latent variables in the form of structural equation models comprising latent variables. Latent variables are variables that cannot be measured directly

but can be represented or measured by one or more observed variables (referred to in this thesis as 'indicators'). SEM takes a confirmatory approach to the analysis of a structural theory bearing on the phenomena of interest (Byrne 2001) and provides an appropriate form of statistical testing.

In common with a number of other multivariate techniques, SEM has three assumptions: independent observations, random sampling of respondents and the linearity of all relationships (Hair *et al.* 1998). Each of those assumptions is satisfied in this thesis.

Testing the hypothesised model using SEM has advantages over other statistical testing procedures (Hair *et al.* 1998). First, it has the ability to represent latent variables in hypothesised relationships; second, it allows estimation of multiple and interrelated dependence relationships; and third, it can account for measurement error in the estimation process. SEM has the capacity to consider all three of these simultaneously. The approach taken to data analysis in this thesis is the two-stage approach. The first stage addresses the question of the adequacy scale of measurement scales (reported in Chapter 6). The second stage involves testing the structural model (reported in Chapter 7).

5.2.1 SEM software

The hypothesised models were tested with SEM using LISREL 8.54 (Jöreskog, K. G. *et al.* 2003) (LISREL), due to its capacity to treat ordinal variables as continuous by creating and analysing polychoric correlation matrices. Another advantage of using LISREL is its capacity to apply a variety of methods of estimation, including Maximum Likelihood (ML) and Weighted Least Squares (WLS)⁶⁴. Estimation methods are used to establish the values of parameters in the model (for example, coefficients, error terms and residuals) using matrix algebra. ML is employed in analysing model fit in this thesis as it is thought to perform well in less-than-optimal analytic conditions; for example, when there is evidence of non-normality, as would appear to be the case in the sample data⁶⁵. Of the estimation procedures available, ML is thought to be reasonably robust to small sample size and variables that exhibit excessive kurtosis. Since ML possesses these characteristics, as well

⁶⁴ Weighted least squares (WLS) is also referred to as the asymptotically distribution free (ADF) estimation procedure.

⁶⁵ Refer to Section 4.8 for a discussion of univariate normality and Section 7.3 for a discussion of normality of the data.

as being the most widely used estimator, it has been suggested that authors routinely report results from ML estimation (Hoyle & Panter 1995). In the event that other estimation methods are judged as being more appropriate, as is the case for excessive nonnormality where WLS is more suitable (du Toit & du Toit 2001), those methods of estimation are also reported.

LISREL output provides three pieces of information for the parameters to be estimated (that is, the 'free' parameters). They are the standardised (or unstandardised) parameter estimate, its standard error and the relevant *t*-value, each of which is interpreted as follows⁶⁶. Unstandardised parameter estimates show the resulting change in a dependent variable from a change in an independent variable, measured in the original units. The standardised parameter estimate indexes the number of standard deviations change in the independent variable when all remaining independent variables are zero (their mean in standard normal units) (Hoyle 1995). In both cases the sign of the relevant parameter captures the direction of the change (positive signs signifying an increase in the value of the dependent variable and a negative sign a decrease). For the purposes of this thesis, the standardised parameter estimate is presented since it is the pattern of relationships between variables that is important. The purpose of including this statistic is that it is useful in determining the relative importance of each variable to the others in the sample. Despite the fact that all variables are measured on a 1 to 7 scale, the standardised parameters are much more easily interpreted. Care must be taken in the use of the standardised parameter estimates, however, due to the fact that they are thought to be sample-specific and not stable across different samples because of changes in variance of the variables (Schumacker & Lomax 1996).

The standard error shows how precisely the value of the parameter has been estimated; the smaller the standard error, the better the estimation. Care must be taken with this statistic as reported, since whereas standard errors produced using ML under conditions of multivariate normality are correct, under other conditions and estimation techniques they need to be treated with caution. The *t*-values are similar to critical ratios and are computed by dividing the unstandardised regression weight by its standard error. They are used to determine whether a particular parameter is significantly different from zero in the

⁶⁶ Interpretation of each of these is taken from the description provided by Diamantopoulos *et al.* (2000), Chapter 6.

population using a 2-tailed test. Values that exceed ± 1.645 indicate significance at the $p \leq 0.1$ level; those that exceed ± 1.96 indicate significance at the $p \leq 0.05$ level; and those that exceed ± 3.3 indicate significance at the $p \leq 0.01$ level. The criterion for hypothesis testing in this thesis is the $p \leq 0.05$ level of significance (that is, t -values outside the ± 1.96 range).

5.2.2 Model identification

A requirement for SEM to be carried out effectively is that each of the models tested should be overidentified. That is, there must be more data points (usually variances and covariances) than parameters to be estimated (Kerlinger 1979). In order to determine whether a model satisfies this condition two heuristics are available: they are the order condition and the rank condition. Under the order condition a model will be overidentified if there is a positive number of degrees of freedom. That is, it has more information in the data matrix than the number of parameters to be estimated. A model that achieves fit with as many degrees of freedom as possible ensures that model's generalisability (Hair *et al.* 1998). Under the rank condition, a variable with three or more indicators will always be identified (Hair *et al.* 1998), although a model with only three indicators will be only just identified and each factor will need to have its metric set. In such circumstances it is necessary to constrain one additional parameter in order to produce a model that is overidentified, thereby producing a model capable of being tested.

5.2.3 Covariance versus correlations

SEM computer programs in general accept either raw data, variance/covariance matrices or correlation matrices as input. LISREL does not accept raw data directly, rather it references variance/covariance or correlation matrices generated from the raw data by a related program, PRELIS (Jöreskog *et al.* 1999). The variance/covariance matrix has the advantage of providing valid comparisons between different populations or samples, thereby increasing the generalisability of the findings (a feature thought not exist with use of the correlation matrix). The correlation matrix, on the other hand, is best used when the objective of the research is to understand the pattern of relationships between the constructs, but not to explain the total variance of the construct (Hair *et al.* 1998). Summarising, Hair suggests that the variance-covariance matrix should be employed whenever a test of theory is being performed, as the variances and covariances satisfy the assumptions of the methodology and are the appropriate form of the data for validating

causal relationships⁶⁷. Thus, the input matrix used for data analysis in this thesis is the variance-covariance matrix for the analysis of both the measurement models and the structural model.

5.2.4 Model fit

A major advantage of using the model-fitting capabilities of SEM (over, for example, the use of multiple regression) is that it generates numerous indices that assess the degree of overall fit of the model to the data (Kline 1998). The model fit ensures that the model,

... is an adequate representation of the entire set of causal relationships (Hair et al. 1998, p. 633).

While a large number of fit measures provide considerable advantage to SEM, it is essential to limit the number of fit indices reported in the interests of parsimony, since they are large and growing in number. A description of the fit indices used in this thesis follows and a summary is contained in Table 5-1. Three categories of fit indices are used to assess fit in this thesis; they are tests of absolute fit, incremental fit and tests of parsimony (Hair *et al.* 1998).

Absolute fit

Absolute fit measures determine the degree to which the overall model (both structural and measurement models) predicts the observed covariance or correlation matrix (Hair *et al.* 1998). The indices used from this group include the chi-square (χ^2) statistic and the *scaled* χ^2 (per degree of freedom⁶⁸, χ^2/df). A large value of χ^2 relative to the degrees of freedom signifies that the observed and estimated matrices differ considerably. In addition, statistical significance levels indicate the probability that these differences are due solely to sampling variations. Optimal fit is indicated with a zero value and increasing values indicate greater departure of the implied covariance matrix from the observed covariance matrix (Hoyle & Panter 1995). Thus, low χ^2 values indicate that the actual and predicted input matrices are not statistically different and non-significant p -values for χ^2 statistics

⁶⁷ All measurement models incorporated into the structural model were developed from those that have been tested in the literature.

⁶⁸ The χ^2/df is also used as a measure of parsimony as well as absolute fit, but is included here as a measure of absolute fit only.

(> 0.05) indicate that the observed and estimated matrices are not significantly different and that the data fit the model. Since low values of χ^2 indicate good fit, χ^2 tests are usefully thought of as measures of 'badness of fit'. While there is no identified cut-off for the χ^2 value, a frequent suggestion for good fit is that the χ^2 per degree of freedom (χ^2/df) be less than 3 (Kline 1998).

The *goodness of fit index* (GFI) indexes the relative amount of the observed variances and covariances accounted for by a model. It is analogous to the R^2 commonly used to summarise results of multiple regression analyses. The *adjusted goodness of fit index* (AGFI) includes a built-in adjustment; this penalises complex models. The range of possible values for both these indices is from 0 to 1 and reported values that exceed 0.9 are thought to represent reasonable levels of fit. The *root mean square error of approximation* (RMSEA) also penalises complex models and is also included as a fit index since it is representative of the goodness of fit that could be expected if the model were estimated in the population, not just the sample drawn for estimation (Hair *et al.* 1998). Values of less than 0.05 indicate good fit, although values ranging from 0.05 to 0.08 indicate acceptable model fit.

Incremental fit

Incremental fit concerns the degree to which the model is superior to an alternative model, usually one that specifies no covariances among variables (the 'null' model). In assessing 'goodness of fit', higher values indicate greater improvement of the model over an alternative model. The index recommended by (Hoyle & Panter 1995) is the non-normed fit index (NNFI) (Bentler & Bonett 1980). It is also referred to as the Tucker-Lewis index (TLI) (Tucker & Lewis 1973) and performs well when maximum likelihood is used. It contains a penalty function based on the number of estimated parameters. Another index chosen for the analysis of incremental fit is the comparative fit index (CFI) (Bentler 1990). Its values fall within the range 0 to 1 and they are derived from the comparison of the hypothesised model with the independence (null) model (the model where all variables are completely independent), providing a measure of complete variation in the data. For both the NNFI (TLI) and CFI, measures of acceptable fit are identified when measures exceed 0.90.

Table 5-1 Summary of fit indices used to test SEM models

Name	Abbrev.	Type	Acceptable level	Comments
Measures of absolute fit				
Chi-square	χ^2	Model fit	Smaller values of χ^2 reflect better fit	χ^2 is sensitive to sample size, both small and large, with larger samples generally being more desirable. An accepted sample size is 200 (Schumacker & Lomax 1996). Caution is needed when interpreting χ^2 .
Probability level of chi-square	p		$p > 0.05$	Non-significance provides support for the model (no significant difference between sample data an hypothesised model).
Normed chi-square	χ^2/df	Absolute fit and model parsimony	$1.0 < \chi^2/df < 3.0$	Values close to 1 indicate good fit.
Goodness of fit Adjusted goodness of fit	GFI/AGFI	Absolute fit	GFI/AGFI > 0.95	Values between 0.90 and 0.95 may also indicate satisfactory fit.
Root mean-square error of approximation	RMSEA	Absolute fit	RMSEA < 0.05	Values between 0.05 and 0.08 may also indicate satisfactory fit.
Measures of incremental fit				
Tucker-Lewis index	NNFI/TLI	Incremental fit	NNFI > 0.95	Values between 0.90 and 0.95 may also indicate satisfactory fit.
Comparative fit index	CFI	Incremental fit	CFI > 0.95	Values between 0.90 and 0.95 may also indicate satisfactory fit.
Measures of parsimonious fit				
Akaike information criterion	AIC	Accounts for degrees of freedom	No defined level	Smaller AIC for model compared with independence and saturated models adjusted for the number of parameters.
Consistent Akaike information criterion	CAIC	Accounts for sample size	No defined level	Smaller CAIC for model compared with independence and saturated models adjusted for sample size ⁶⁹ .

⁶⁹ Since the CAIC adjusts for sample size, for the purpose of data analysis in this thesis it is the preferred measure of parsimonious fit.

Measures of parsimony

Measures of parsimony, while not measures of 'fit', adjust for the complexity of the model; more complex models tend to result in better measures of fit (Kline 1987). The Akaike (1987) information criterion (AIC) takes into account goodness of fit (χ^2) as well as the number of estimated model parameters. The consistent version (CAIC) performs similarly with respect to fit, except that it takes sample size (rather than model complexity) into account (Bandalos 1993). There is no defined level for assessing fit for these indices, although the model that fits with the smallest value is the most parsimonious fitting model. Both indices compare the fitted model with the independence model (the model where variables are complexly independent and the saturated model (the just-identified model). The preferred measure of parsimony in this thesis is the consistent version, the CAIC, due to the emphasis on sample size as an issue compared with model complexity. None of the models (neither the measurement models, nor the structural model) could be said to be overly complex.

5.2.5 Sample size

The sample size (n) used in for SEM analysis in this thesis is 539. Whether this is adequate depends upon a number of factors and although there is no single criterion upon which the adequacy of sample size can be judged, it has been suggested that there are at least 4 factors that impact upon sample size requirements (Hair *et al.* 1998). Each factor is discussed in turn.

Model misspecification

Model misspecification arises in situations where variables have been omitted from the hypothesised model. In the development of the research questions for this thesis care was taken to ensure, as much as possible, that model misspecification did not occur. This was achieved at one level by emphasising the need for parsimony in developing each of the hypothesised models, while at the same time ensuring that important variables were not omitted. On the other hand, all models were developed from findings reported in the literature and as many variables as possible (given the constraints of time and finance) were included in the initial analysis in order to ensure optimal specification. The final structural model, constructed following CFA of measurement models, comprises only those variables that meet adequacy criteria.

Model size

The models tested in this thesis are not of a size large enough to warrant concern. The largest measurement model, the second-order factor analytic model *transformational leadership*, has a total of 23 distinct parameters to be estimated, while the structural model has a total of 18 distinct parameters to be estimated. Neither of these can be said to be excessive in size. It has been recommended that a minimum ratio of 5 respondents for each estimated parameter, with a ratio of 10 respondents per parameter is most appropriate (Hair *et al.* 1998). Following this criterion, the minimum sample size required is 230.

Departures from normality

Tests of the normality of the data used for statistical analysis in this thesis reveal cause for concern and this must be taken into account in determining the sample size required. Univariate normality is discussed in Section 4.8, while the normality of the data is discussed in Section 7.3. Violation of the assumptions of normality necessitates an increase in the ratio of respondents per parameter to 15 (Hair *et al.* 1998). With reference to this criterion, the minimum sample size required is 345.

Estimation procedure employed

Maximum likelihood (ML) is the estimation method used in this thesis in the first instance and requires an absolute sample size of 200 respondents. The minimum sample size is identified as lying between 100-150, with samples in excess of 500 becoming too sensitive, causing all goodness of fit measures to become unreliable (Hair *et al.* 1998). This is especially the case for the χ^2 test. A sample size of 539 meets the minimum size criterion, although given the departures from normality identified in the data it appears necessary to employ an estimation procedure that takes account of nonnormality. Such are the properties of the weighted least squares (WLS) estimation method, although use of this method requires a much larger sample size.

An analysis reported by Hu & Bentler (1995) reveals that, when WLS is employed as the estimator, absolute fit indices (for example, GFI and AGFI) require sample sizes in excess of 5,000. It was also found that incremental fit indices (NNFI and CFI) based on WLS required sample sizes of 500 or more. When the AGFI was tested for convergence with known population parameters, the values produced by WLS converged with samples greater than 250 when the latent variables were independent. In summary, therefore, it appears that the minimum sample size required for absolute fit indices is 5,000, although

for incremental indices the requirement is for a sample size in excess of 500. Thus, care is required in the interpretation of model fit when responses fall below 5,000 in total. A sample size of 539 is not adequate for all measures of fit using WLS and care is needed in the interpretation of results.

5.3 Measurement models

As recommended by Schumacker and Lomax (1996), SEM is undertaken in this thesis as a two-stage process. The first stage, outlined in this section, involves the development of measurement models. Measurement using SEM is a process by which,

... a concept is linked to one or more latent variables, and these are linked to observed variables (Bollen 1989, p. 180).

This provides a means of assessing the extent to which indicators are linked to underlying latent factors. In contrast to exploratory factor analysis that attempts to identify links between observed and latent variables that are uncertain (not known in advance), a confirmatory approach is appropriate for situations in which there is knowledge of the underlying variable structure identified in previous studies. Such is the case in this thesis.

Measurement models assume that the indicators depend on the latent variables and confirmatory factor analysis (CFA) tests whether an hypothesised measurement model is unidimensional. It is necessary to include indicators that measure the variable and to eliminate items that do not; that is, to evaluate their correspondence to the data. In order to determine the extent to which indicators measure the same variable it is necessary to identify whether responses to a particular item reflect the pattern of responses on the other items (de Vaus 1991).

5.3.1 Testing multicollinearity

Prior to CFA testing of measurement models it is necessary to test for multicollinearity. Multicollinearity is the association, measured as correlation, between three or more independent variables and its impact is to reduce any single independent variable's predictive power by the extent to which it is associated with other independent variables. To maximise the prediction from a given number of independent variables, they should have both low multicollinearity with the other independent variables and high correlations with the dependent variable (Hair *et al.* 1998). Tests undertaken to identify problems of

multicollinearity focus on the *Variance Inflation Factor (VIF)*, as discussed in Hair *et al.*, (1998). The acceptable *VIF* cut-off for this study is set at 5.5, since any variables above this value would have a correlation of more than 0.90. In addition, *Condition Indexes* were examined to determine whether high values (in excess of 30) coincided with *Variance Proportions* of greater than 0.50 (Hair *et al.* 1998). Indicators that did not meet these tests should not be incorporated into the structural model.

The structural model hypothesised in this thesis comprises first-order and second-order measurement models, each of which is tested for unidimensionality. The following two sub-sections contain discussions of the structures of these measurement models.

5.3.2 CFA first-order measurement model testing

First-order measurement models hypothesise one latent variable measured with a number of indicators. Each of the first-order measurement models developed in Chapter 3 comprised four indicators initially and were developed from those published in the academic literature wherever possible⁷⁰, thereby satisfying tests of content validity. Each of the paths in the model depicts the underlying dimensions that describe the measurement of the latent variables. The strength of these relationships determines the extent to which the indicators measure the underlying latent variable and hence the validity of the scale. Tests of unidimensionality are run on the scales prior to tests of reliability⁷¹, since reliability measures assume that unidimensionality exists (Hair *et al.* 1998).

When testing for unidimensionality, reference is made to the squared multiple correlation (SMC) statistics⁷², which measures the inter-item correlation (the correlation among items in the scale). SMCs show how well the variation in the independent variable accounts for variation in the dependent variable. It has been suggested that items with SMCs of less than 0.3 should be discarded (de Vaus 1991). Where indicators do not meet these criteria, justification for their deletion is also considered.

In addition to the requirement that any CFA measurement model must be overidentified, every latent variable must also have a scale (that is, a metric) to enable SEM computer

⁷⁰ Refer to Chapter 3 for a discussion of this literature.

⁷¹ A discussion on the testing of reliability is contained in Section 5.3.3.

⁷² SMCs are equivalent to R^2 s, squared multiple correlation coefficients showing the percentage of the total variation of one variable explained by another variable.

programs to calculate estimates of the effect of each indicator. This can be achieved in two ways: either by constraining the variance of the latent variable equal to a constant (usually 1) or by constraining the loading of one indicator per latent variable to 1 (Kline 1998). The effect of the former alternative is to standardise the latent variable; the effect of the latter alternative is to give the latent variable the same metric as that indicator. The scale for each of the latent variables in the first-order measurement models in this thesis, the default in LISREL 8.54, was determined by constraining the variance of the latent variable to 1⁷³.

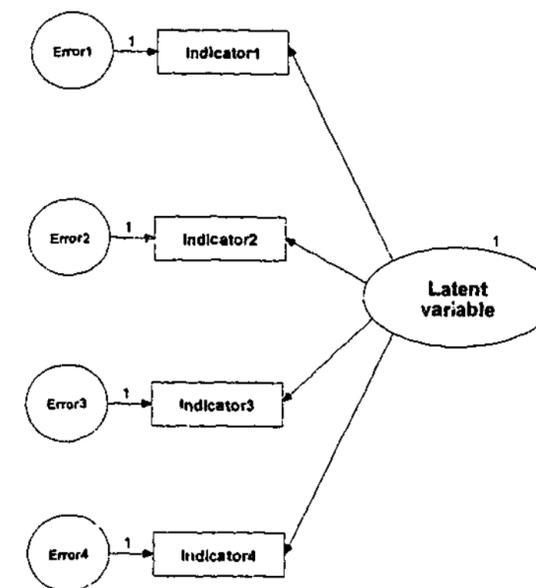
A further process of specification is necessitated when there are only three indicators for one-factor models. Although it is possible to estimate exactly identified models, two of the error variances in each were constrained to be equal, thereby increasing the number of degrees of freedom to 1 and producing overidentified models. It has been demonstrated how constraining parameters to be equal within a single group can result in proper solutions when less constrained models result in improper solutions (Marsh, Byrne & Craven 1993). This procedure is justified in the recognition that a well fitting parsimonious model is better than a well fitting model that is saturated (or near saturated). Whenever this procedure was deemed necessary, the errors of indicators chosen for constraint were those with error variances that were approximately the same size. In addition, wherever this constraining process was used, the values for error variances of indicators to be constrained in the initial four-indicator measurement model are presented. Since the process of testing measurement is confirmatory in nature (and not exploratory), this was determined to be acceptable.

The structure of first-order measurement models is illustrated in Figure 5-1 and observation of this figure reveals that single-headed arrows point from the latent variable to each of its indicators. This demonstrates that there is a common underlying factor that gives rise to each of the indicators. The error terms, illustrated by the set of circles with arrows pointing into each of the indicators from their left, represent that part of the indicator that is not accounted for by the latent variable. Error terms represent the degree to which the variables that are measured do not perfectly describe the latent variables of interest (Hair *et al.* 1998). There are three possible causes of measurement error: first, an

⁷³ The choice of method is not a problem for models with indicators that are exogenous, as is the case in the data analyses in this thesis (Kline 1998).

observed variable that is measuring some other latent variable; second, unreliability; or third, a second-order factor (Schumacker & Lomax 1996). Inclusion of errors in the measurement model reflects that latent variables are fallible and that they are unable to be measured accurately. Error terms are associated with all model structures, including measurement models and structural models.

Figure 5-1 Hypothesised first-order CFA model structure



5.3.3 Testing reliability

Reliability is an assessment of the degree of consistency between multiple measurements of a variable. One approach to assess reliability is to examine the consistency of a person's response on an item compared to each other scale item (de Vaus 1991) and the diagnostic procedure used to assess reliability is Cronbach's (1951) alpha. This assesses the consistency of the entire scale and provides information about the relationships between individual items in the scale (Hair *et al.* 1998). The index of alpha scores ranges from 0 to 1 and scores in excess of 0.7 indicate scale reliability for confirmatory factor analysis (Burke 1986). Assessments of reliability for each of the first-order measurement models using Cronbach's alpha statistics are included in the analyses for each scale.

5.3.4 CFA second-order measurement model testing

Second-order measurement models⁷⁴ hypothesise that a 'second-order' latent variable is explained by, and is reflective of, other 'first-order' latent variables. It has been proposed that more general and abstract latent variables may determine the first-order latent variables and that,

... latent variables directly influencing the observed variables may be influenced by other latent variables that need not have direct effects on the observed variables (Bollen 1989, pp. 313-314).

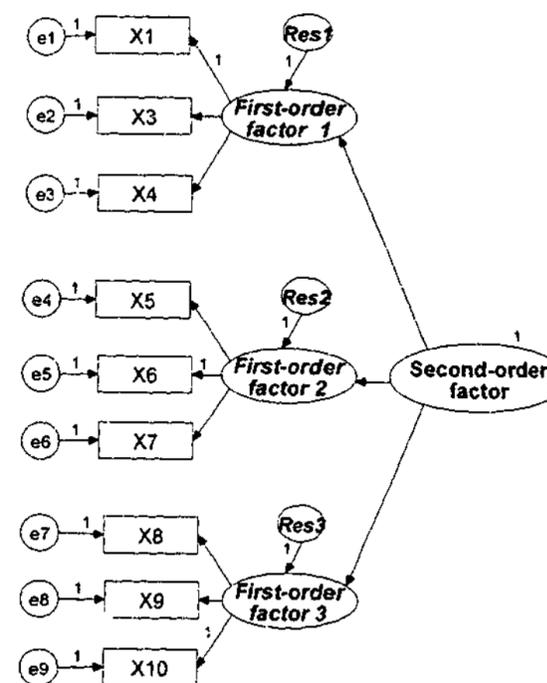
It has been argued that the failure to consider higher-order factors may explain the correlated errors that are common in CFA and that the higher-order factors are more informative than the correlated error representation (Gerbing & Anderson 1984). The structure of hypothesised second-order models is represented in Figure 5-2, identified as a pattern of interrelated ellipses. Observation of this figure reveals three measurement models, each represented as one ellipse, measured by three measurement items, and corresponding error terms and labelled as a first-order factor. The overarching ellipse is labelled as a second-order factor 'explained' by the three latent measurement models. To determine the scale of the latent variable of the first-order models, the loading of one of the indicators is constrained to 1. To determine the scale for the latent variable of the second-order models, the variance of the second-order variable is also constrained to 1, the default in LISREL 8.54. Following Byrne (1993), second-order CFA models hypothesise the following.

1. Responses to indicator items for second-order latent variables could be explained by a number of first-order factors and one second order factor;
2. Each item would have a non-zero loading on the first-order factor it was designed to measure and zero loadings on the other first-order factors;
3. Error terms associated with each item would be uncorrelated; and
4. Covariation among the first-order factors would be explained fully by their regression on the second order factor.

⁷⁴ Second-order measurement models are otherwise referred to as 'higher-order measurement models'.

In addition to error terms associated with each of the indicators, each of the first-order factors is accompanied by a 'residual'. Residuals represent that part of a dependent variable that is not accounted for by the linear influence of the independent variables. Thus, observation of Figure 5-2 reveals that the 'second-order' factor can be accounted for by the linear effects with the 'first-order' factors, plus the effects of the associated residuals (in Figure 5-2, 'Res1', 'Res2' and 'Res3') (Kline 1998, Byrne 2001).

Figure 5-2 Hypothesised second-order CFA model structure



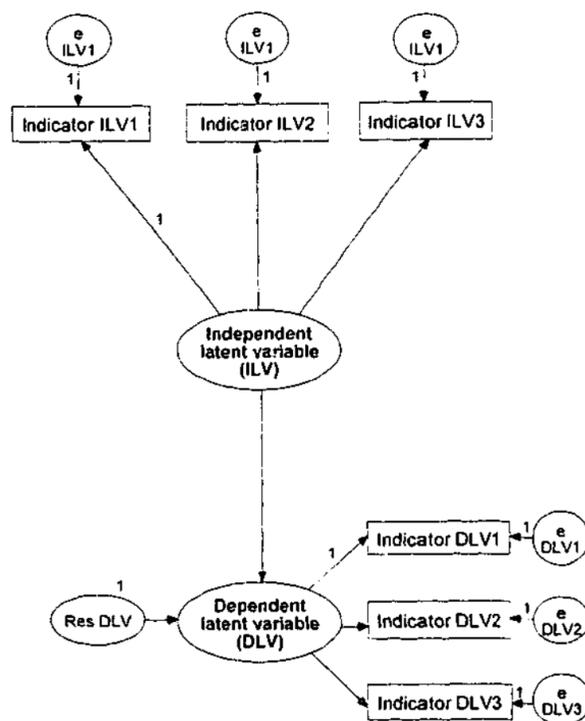
5.4 Structural models

This section contains an outline of the second stage of the SEM process recommended by Schumacker and Lomax (1996). Structural models test hypothesised patterns of causal structure linking several latent variables. Hoyle (1995, p. 3) identifies the structural model as,

... that component of the general model that prescribes relations between latent variables and observed variables that are not indicators of latent variables.

As with CFA measurement models, each measured latent variable has a variance that is defined as a model parameter. The indicators do not account for the measurement of the latent variable entirely, however, and are accompanied by a latent variable that represents measurement error. In Figure 5-3, an ellipse pointing into each of the indicators is the diagrammatic representation of this error term. In this, the second stage of the SEM process, these error terms are constrained to a value of measurement error that is known. This process is explained in the following sub-section.

Figure 5-3 Hypothesised structural model



In addition to measurement errors, dependent (endogenous) variables (latent variables that have arrows pointing into them) are influenced by an error term (referred to as a 'residual') (MacCallum 1995). Since dependent variables are not entirely explained by the independent variables, the residual represents the portion of the latent dependent variable

that is not explained or predicted by the latent independent variable (or variables) in the structural equation. Every residual in the model can be viewed as a latent variable that exerts a linear influence on the variable with which it is associated⁷⁵.

5.4.1 Creation of composite variables

SEM is used in this thesis as a two-stage process and the observed variables in the structural model were developed following CFA testing of measurement models (discussed in Section 5.3). The process adopted in this thesis is to create composite items for each of the first-order measurement models prior to incorporating them into the structural model⁷⁶. In order to produce composite measures for the variables in the structural model it was necessary to choose an appropriate method to achieve this. One option is to construct variable scores by summing or taking the mean of the items that purport to measure the same variable (Hair *et al.* 1998). Another option is to use a weighting procedure whereby the factor scores are used to weight each indicator according to the extent to which it loads onto the latent variable. Despite the advantage of using factor scores in a weighting procedure, however, a disadvantage of using this method is that results are not easily replicated across studies because they are based on the factor matrix that is derived separately in each study. As a result, this makes generalisation of the results more difficult (Hair *et al.* 1998). Therefore, since the emphasis in this thesis is to facilitate replication and to generalise the findings, averaging is used to create composite variables⁷⁷.

5.4.2 Model specification

The process of model specification ensures that hypotheses are expressed in the form of a structural equation model. The equations that underlie the structural model define the model's parameters that correspond to presumed relations among observed and latent variables that the computer program estimates with the sample data (Kline 1998). Part of

⁷⁵ This is an important property of the model, since in LISREL it is assumed that equations are linear in the variables and linear in the parameters (Bollen 1989).

⁷⁶ An alternative procedure is to bring the complete measurement models into the structural equation. This comes at a risk of estimation inefficiency and possible omitted variable bias. This is not the preferred option due to a preference for simplicity and parsimony.

⁷⁷ Using means to create the composite variables is used in preference to summation to preserve, as much as possible, the original 1-7 scales used in the survey forms.

the process of identification for the structural model, as with measurement models, is to ensure that each of the latent variables, including error terms and residuals, has a scale. For the hypothesised structural model this is achieved by constraining the loading of one of the factors for each of the second-order latent variables to 1. This is the default procedure in LISREL 8.54.

Single, directly-observed variables in a model (for example, age or income) are normally considered and specified to be free from error (MacCallum 1995). Since the latent variables in the hypothesised structural model for testing are measured using only one (composite) item, however, it is necessary to specify the measurement error associated with each to a value that is representative of that measurement error. This is achieved by constraining the variance of the error term to the value of the variance of the observed variable multiplied by 1 minus its reliability (Cronbach's alpha) (Hair *et al.* 1998). Details of the calculation of this measurement error and constraint of the error terms for the summated items are contained in Section 6.7.

5.4.3 Multivariate normality

Potential problems in estimation of structural equation models are introduced when the distribution of the observed variables departs substantially from multivariate normality (West, Finch & Curran 1995). However, Hair (1998, p. 349) states,

Multivariate normality assumes that the joint effect of two variables is normally distributed. Even though this assumption underlies most multivariate techniques, there is no direct test for multivariate normality. Therefore, most researchers test for univariate normality of each variable (Hair et al. 1998).

Thus, for the purpose of data analysis in this thesis, despite the underlying assumption of multivariate normality, no data analysis is undertaken to test for this. Hair *et al.* (1998, p. 349) further advises, however, that,

Violations of [the assumption of multivariate normality] have little impact with larger sample sizes ...

A discussion of the adequacy of sample size in this thesis is contained in Section 7.3.

5.5 Advantages, assumptions and limitations of SEM

As discussed in Section 5.2, structural equation modelling (SEM) was selected for data analysis in this thesis for the following two reasons. First, SEM accommodates multiple interrelated dependence relationships, drawn from theory, prior experience and the research objectives of the study. Second, it incorporates latent variables: latent variables are variables that are not measured directly (Hair *et al.* 1998).

SEM has a distinct advantage over other multivariate techniques such as multiple regression, factor analysis and multivariate analysis of variance. That advantage is the capacity to examine a set of dependence relationships simultaneously and it is particularly useful when one dependent variable becomes the independent variable in a subsequent dependence relationship.

Care is necessary in the use of SEM, however, since models can be tested on an *a priori* or an exploratory basis. In relation to the various approaches taken by SEM analyses, Hair (1998, p. 590) states,

In some instances, the relationships are strictly specified and the objective is a confirmation of the relationship. At other times, the relationships are loosely recognized and the objective is the discovery of relationships. In each extreme instance and points in between, the researcher must formulate the use of the technique in accordance with the research objectives.

Thus, SEM is appropriately used as a tool for the confirmation of hypothesised relationships and care needs to be taken to identify when it is used for purposes of confirmation and when it is used as a tool of exploration, such as in the testing of competing models. In this thesis, the SEM analysis is undertaken as a means of confirming hypothesised relationships. It is not concerned with the discovery of relationships. Computer programs used for SEM require researchers to provide a lot of information relating to which variables are assumed to affect others and the directionalities of these effects (Kline 1998). The purpose of this, and the following chapter, is to provide this information.

A limitation in the use of SEM is that it is essentially a large-sample technique. There is no answer to what sample size is adequate, although a sample size of fewer than 100 cases is thought to be untenable. Sample sizes of more than 200 cases have been considered

'large', although the type of estimation method used in the analysis requires many more than 200⁷⁸. Using an estimation procedure such as WLS requires a sample size of 5,000.

5.6 Chapter summary

The purpose of this chapter is to present the processes and techniques used to analyse the data for hypothesis testing. The aims and processes of SEM are identified, as well as the processes by which the data were tested for suitability for SEM analysis. A description of both CFA and structural model testing are presented, as are advantages, assumptions and limitations in the use of SEM. The next two chapters contain descriptions of the results of hypothesis testing using confirmatory factor analysis of the measurement models and analysis of the structural model.

⁷⁸ A discussion on the adequacy of sample size is presented in Section 7.5.

Chapter 6

Hypothesis testing: Measurement models

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Chapter 6

Hypothesis testing: Measurement models

6.1 Introduction

The hypotheses in this thesis are tested using a two-stage process. This chapter contains a description of the results of the first stage, testing whether measurement models meet the criteria necessary for the creation of composite variables. The previous chapter, Chapter 5, contains a description of the statistical processes undertaken in hypothesis testing. Results of the second stage, tests of the structural model, are presented in the following chapter, Chapter 7.

The remainder of this chapter is set out as follows. Section 6.2 contains details of the testing of the second-order measurement model, *psychological empowerment*, including descriptions of its first-order indicators. Section 6.3 contains a similar description of the second-order variable *transformational leadership*. The next two sections, Section 6.4 and Section 6.5, contain descriptions of the first-order models that describe the antecedents to *psychological empowerment* and then the antecedents to *transformational leadership* respectively. Section 6.6 contains a description of the measurement of the outcome variable, *innovation in management structure*. Section 6.7 contains a description of the method of calculation of the scores for composite variables and Section 6.8 contains a discussion on the limitations and assumptions of CFA testing of measurement models. The chapter concludes with a summary in Section 6.9.

6.2 Psychological empowerment

Psychological empowerment is hypothesised as a second-order measurement model. First-order measurement models for each of the dimensions of this model are discussed first, followed by a discussion of the second-order model. Where the statistics indicate that one or more indicators should be deleted, implications are discussed as part of the overall discussion for each measurement model. Results of the statistical analyses for the first-order measurement models are summarised in Tables 6-1, 6-2 and 6-3. Diagrammatic representations of each measurement model are presented along with the discussion relating to model adequacy and include the standardised parameter estimates. Sample covariance matrices are to be found in Appendix E.

6.2.1 First-order measurement models

Of the four hypothesised first-order measurement models of *psychological empowerment*, only three remain following analysis of univariate normality (discussed in Section 4.8). They are *competence*, *impact* and *self-determination*.

Table 6-1 *Psychological empowerment: Initial scale assessment*

Item/Scale	SMC Item 1	SMC Item 2	SMC Item 3	SMC Item 4	Item for deletion
<i>Competence</i>	0.822	0.478	0.656	0.088	4
<i>Impact</i>	0.603	0.184	0.467	0.547	2
<i>Self-determination</i>	0.740	0.405	0.461	0.062	4

Table 6-2 *Psychological empowerment: First-order fit indices*

Index/Model	χ^2	df	N	p	χ^2/df	GFI	AGFI	RMSEA	NNFI (TLI)	CFI	CAIC (saturated model)
<i>Competence</i>	1.022	1	539	0.312	1.022	0.999	0.992	0.006	1.000	0.999	37.470 (43.738)
<i>Impact</i>	0.647	1	539	0.421	0.647	0.999	0.995	<0.001	1.004	1.000	37.095 (43.738)
<i>Self-determination</i>	1.099	1	539	0.295	1.099	0.999	0.992	0.014	0.999	1.000	37.546 (43.738)

Each measurement model was analysed in the first instance using all four indicators to test for unidimensionality (SMCs of indicators exceeding 0.3) and results of these analyses are contained in Table 6-1 (items with low SMCs are presented in bold format). Observation of this table reveals that one indicator in each of the measurement models fails to meet this criterion and should be deleted. Table 6-2 contains fit indices for these first-order indicators (after deletion of items).

Competence

Examination of Table 6-1 reveals that Item 4 ('I have not yet mastered the skills necessary for my job as a school principal') produces an SMC of 0.088. The item was added to those

developed by (Spreitzer 1995a) for the purpose of controlling for the 'halo effect'⁷⁹. It would appear that the introduction of a negatively-worded indicator has not successfully tapped into the measurement of *competence*, possibly due to the reference to the 'mastery of skills', which is not present in each of the other indicators. There is justification for deletion of this indicator.

Table 6-3 *Psychological empowerment: First-order factor loadings*

Variable	Indicator	Parameter estimate	Standardised Parameter estimate	SE	SMC	t-value		
<i>Competence</i>	COMP1	0.713	0.909	0.107	0.818	24.158	***	
	Cronbach's alpha: 0.8382	COMP2	0.571	0.702	0.326	0.487	17.507	***
		COMP3	0.768	0.798	0.037	0.652	20.891	***
<i>Impact</i>	IMPACT1	0.603	0.771	0.031	0.539	19.445	***	
	Cronbach's alpha: 0.7764	IMPACT2	0.461	0.429	0.034	0.577	15.665	***
		IMPACT4	0.556	0.744	0.030	0.486	18.589	***
<i>Self-determination</i>	SLFDET1	1.215	0.898	0.065	0.715	18.820	***	
	Cronbach's alpha: 0.7561	SLFDET2	0.747	0.617	0.055	0.445	13.683	***
		SLFDET3	0.787	0.637	0.056	0.418	14.161	***

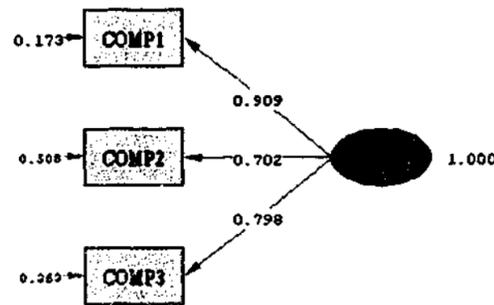
*** = significant at the $p < 0.001$ level

The measurement model for *competence* was run again with only three indicators (excluding Item 4). In order to produce an overidentified model, the error variances of Item 2 (0.350) and Item 3 (0.312) were constrained to be equal since their values most closely approximated each other in size. The indices resulting from this analysis are contained in Table 6-2 and all indicate acceptable levels of fit, with $\chi^2 (1, n = 539) = 1.022$, $p < 0.312$, $\chi^2/df = 1.022$, GFI = 0.999, AGFI = 0.992, NNFI = 1.000, CFI = 0.999, RMSEA = 0.006 and CAIC = 37.470 (saturated model = 43.738). Parameter estimates for all the dimensions of *competence* are contained in Table 6-3, where all standard errors for its indicators are acceptable and parameters are significant at the $p < 0.001$ level (t -values > 3.3). Cronbach's alpha for the three-item scale was 0.8382 and assessed to be acceptable. Overall there is evidence to support the hypothesised model as an adequate measure of *competence* using three indicators. Figure 6-1 contains a diagrammatic

⁷⁹ The halo effect exists in the situation where respondents systematically bias the response by carrying over a generalised impression of the subject from one response to another (Emory & Cooper 1991). The halo effect was controlled also by randomising the entire set of measurement questions in the survey form.

representation of the model for *competence* (with indicators numbered and labelled as 'COMP') and includes standardised parameter estimate values.

Figure 6-1 *Competence: First-order measurement model*

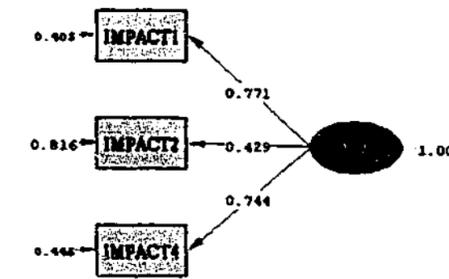


Impact

Item 2 of the impact scale ('I do not have much control over what happens in my school'), producing an SMC of 0.184, is a reverse-scored indicator in this thesis included additionally in an attempt to minimise the halo effect. It differs from indicators in the original set in that it refers to 'control' within the school, which implies a much stronger form of weight than those in the other indicators (that is, 'influence', 'opinion' and 'impact') and its deletion is justified.

The measurement model for *impact* was run again with only three indicators. In order to produce an overidentified model, the error variances of Item 1 (0.246) and Item 4 (0.248) were constrained to be equal since their values most closely approximated each other in size. The fit indices resulting from this analysis are contained in Table 6-2 and all are acceptable, with $\chi^2(1, n = 539) = 0.647, p < 0.421, \chi^2/df = 0.647, GFI = 0.999, AGFI = 0.995, NNFI = 1.004, CFI = 1.000, RMSEA = 0.001$ and $CAIC = 37.095$ (saturated model = 43.738). Observation of Table 6-3 reveals that all standard errors are acceptable and parameters are significant at the $p < 0.001$ level (t -values > 3.3). Cronbach's alpha for the three-item scale was 0.7764 and assessed to be acceptable. Overall there is evidence to support the hypothesised model as an adequate measure of *impact* with three indicators. Figure 6-2 contains a diagrammatic representation of the model (with indicators numbered and labelled as 'IMPACT') and includes standardised parameter estimate values.

Figure 6-2 *Impact: First-order measurement model*

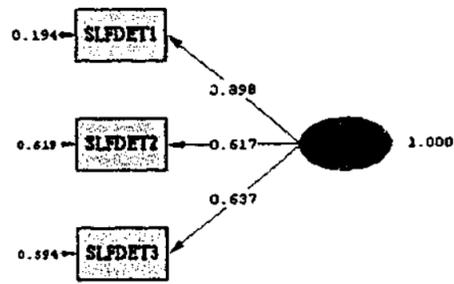


Self-determination

Item 4 of the self-determination scale ('I use personal initiative in carrying out my work as a school principal') produced an SMC of 0.062 and differs from the others in the set possibly through the interpretation of the word 'initiative'. The scale is attempting to capture the perception of the principal's ability to act independently of a higher authority. However, another possible interpretation could be whether the principal believes that he or she regularly introduces initiatives in the administration of the school. There is justification for deletion of this indicator.

The measurement model for *self-determination* was run again with only three indicators. In order to produce an overidentified model, the error variances of Item 2 (0.862) and Item 3 (0.956) were constrained to be equal since their values approximated each other in size. The fit indices resulting from this analysis are contained in Table 6-2 and all appear to be acceptable, with $\chi^2(1, n = 539) = 1.099, p < 0.295, \chi^2/df = 1.099, GFI = 0.999, AGFI = 0.992, NNFI = 0.999, CFI = 1.000, RMSEA = 0.014$ and $CAIC = 37.546$ (saturated model = 43.738). Observation of Table 6-3 reveals that that all standard errors are acceptable and parameters are significant at the $p < 0.001$ level (t -values > 3.3). Cronbach's alpha for the three-item scale was 0.7561 and assessed to be acceptable. Overall there is evidence to support the hypothesised model as an adequate measure of *self-determination* using three indicators. A diagrammatic representation of the model is contained in Figure 6-3 (with indicators numbered and labelled as 'SLFDET') and includes standardised parameter estimate values.

Figure 6-3 *Self-determination: First-order measurement model*



6.2.2 *Second-order measurement model*

Three of the original four variables hypothesised to measure psychological empowerment remain following scale analysis and refinement. They are *competence*, *impact* and *self-determination*. A diagrammatic representation of the second-order model for psychological empowerment is contained in Figure 6-4 showing estimates of the standardised parameters (indicators are labelled in the same way as for the first-order models). Tests undertaken on the measurement indicators for possible collinearity problems indicated that there was no cause for concern. That is, no *VIF* in excess of 5.5 (the highest value 2.702) and no *Condition Index* greater than 30 had more than one variance proportion in excess of 0.5.

SEM tests for this second-order measurement model produced fit indices for this model that can be observed in Table 6-4. They appear to be acceptable, with χ^2 (24, $n = 539$) = 66.04, $p < 0.001$, $\chi^2/df = 2.752$, GFI = 0.973, AGFI = 0.950, NNFI = 0.966, CFI = 0.977, RMSEA = 0.058 and CAIC = 219.9 (saturated model = 328). Although the p -value of χ^2 indicates that there is a significant difference between the sample data and the hypothesised model, an indication of poor fit, other indices suggest that the level of fit is acceptable. A possible explanation for the lack of significance of the χ^2 is that the sample size is relatively large⁸⁰. The model CAIC (which takes account of the sample size) is smaller than both the saturated and independence models, indicating good fit. Overall, therefore, there is support for the second-order model for *psychological empowerment*.

⁸⁰ Refer to Section 5.2.5 for a discussion of the issue of sample size.

Table 6-4 *Psychological empowerment: Second-order fit indices*

Index/Model	χ^2	df	N	p	χ^2/df	GFI	AGFI	RMSEA	NNFI (TLI)	CFI	CAIC (Saturated model)
Psychological empowerment	66.04	24	539	<0.001	2.752	0.973	0.950	0.058	0.966	0.977	219.9 (328.0)

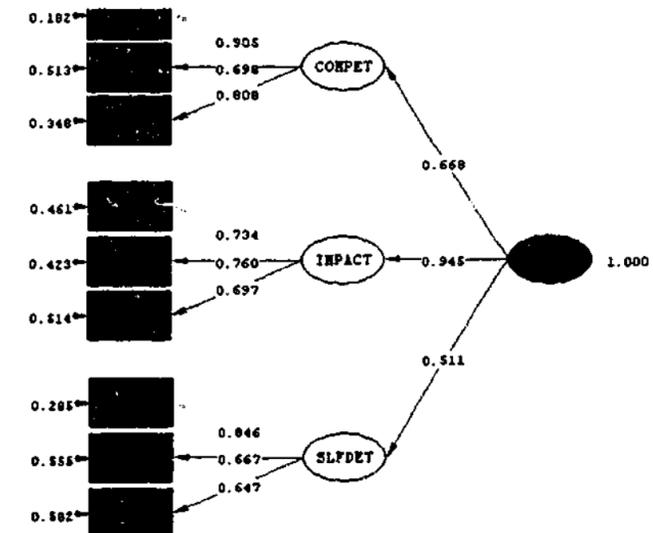
Observation of Table 6-5, containing a summary of the second-order parameter estimates for *psychological empowerment* (structural equations), reveals that all standard errors are acceptable and parameters are significant at the $p < 0.001$ level (t -values > 3.3). SMCs for *impact* and *self-determination* exceed the minimum 0.3 criterion, although *self-determination* produced an SMC of only 0.261. It does not quite meet the minimum criterion of 0.3 and is a candidate for deletion. There is no argument that can be mounted to support its deletion, however, and due to the literature support for the second-order model of *psychological empowerment* it is retained for the purpose of testing the structural model at this stage.

Table 6-5 *Psychological empowerment: Structural equation loadings*

Indicator	Standardised parameter estimate	SE	SMC	t-value	
Competence	0.668	0.059	0.446	11.262	***
Impact	0.945	0.080	0.893	11.798	***
Self-determination	0.511	0.057	0.261	8.983	***

*** = Significant at $p < 0.001$

Figure 6-4 *Psychological empowerment: Second-order model*



Thus, results of statistical testing in this thesis provide support for the conceptualisation of *psychological empowerment* as a multidimensional variable, with each of the first-level variables achieving adequate construct validity. As a consequence, *psychological empowerment* is included into the structural model as a second-order latent variable comprising three first-order indicators (refer to Chapter 7 for a detailed discussion of hypothesis testing).

6.3 Transformational leadership

Measurement models for each of the dimensions of *transformational leadership* were analysed in the first instance using all four indicators to test for unidimensionality (SMCs of indicators exceeding 0.3) and reliability (Cronbach's alpha scores greater than 0.7). Results are summarised in Tables 6-6, 6-7 and 6-8 and observation of these reveals that all criteria are satisfied. Diagrammatic representations, including standardised parameter estimates, are included for all first-order models (Figures 6.5, 6.6, 6.7 and 6.8) as well as for the second-order model in Figure 6-9. Sample covariance matrices can be observed in Appendix E.

6.3.1 First-order measurement models

Five first-order measurement models of *transformational leadership* identified in the literature are *charisma*, *inspiring subordinates*, *intellectual stimulation* and *strategic vision*.

Table 6-6 Transformational leadership: Initial scale assessment

Item/ Scale	SMC Item 1	SMC Item 2	SMC Item 3	SMC Item 4	Item for deletion
<i>Charisma</i>	0.333	0.634	0.576	0.604	nil
<i>Inspiring subordinates</i>	0.847	0.761	0.675	0.806	nil
<i>Intellectual stimulation</i>	0.505	0.494	0.701	0.604	nil
<i>Strategic vision</i>	0.728	0.676	0.887	0.645	nil

Table 6-7 Transformational leadership: Fit indices for indicators

Index/ Model	χ^2	df	N	p	χ^2/df	GFI	AGFI	RMSEA	NNFI (TLI)	CFI	CAIC (saturated model)
<i>Charisma</i>	6.292	2	539	0.043	3.146	0.994	0.970	0.065	0.984	0.995	64.792 (72.897)
<i>Inspiring subordinates</i>	15.603	3	539	0.001	5.201	0.985	0.951	0.090	0.986	0.993	67.092 (72.897)
<i>Intellectual stimulation</i>	5.772	2	539	0.050	2.885	0.995	0.973	0.059	0.986	0.995	64.089 (72.897)
<i>Strategic vision</i>	9.452	2	539	0.009	4.726	0.991	0.955	0.085	0.986	0.995	68.014 (72.897)

Charisma

The measurement model for *charisma* was run with four indicators. The resulting fit indices are contained in Table 6-7 and most appear to be acceptable, with χ^2 (2, $n = 539$) = 6.292, $p < 0.043$, $\chi^2/df = 3.146$, GFI = 0.994, AGFI = 0.970, NNFI = 0.984, CFI = 0.995, RMSEA = 0.065 and CAIC = 64.792 (saturated model = 72.897). The only causes for concern are the RMSEA (which is slightly above the recommended level of 0.05, although it falls well within the maximum of 0.08) and the normed χ^2 of 3.15 (which slightly exceeds the ideal upper limit of 3).

Factor loadings for all the dimensions of *charisma* are contained in Table 6-8. Observation of this table reveals that all standard errors are acceptable and parameters are significant at the $p < 0.001$ level (t -values > 3.3). Cronbach's alpha for the four-item scale is 0.8250. Overall there is evidence to support the measure of *charisma* using four indicators. The measurement model is presented in Figure 6-5 (with indicators numbered and labelled as 'CHARIS') and contains standardised parameter estimate values.

Figure 6-5 Charisma: First-order measurement model

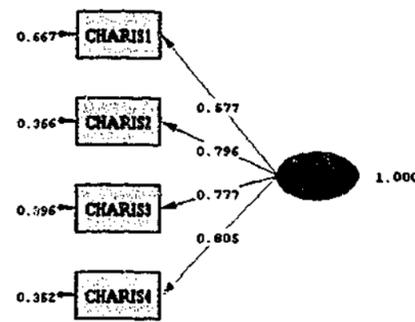


Table 6-8 Transformational leadership: First-order factor loadings

Variable	Indicator	Parameter estimate	Standardised parameter estimate	SE	SMC	t-value	
Charisma Cronbach's alpha: 0.8250	CHARIS1	0.685	0.577	0.051	0.333	14.909	***
	CHARIS2	1.003	0.796	0.049	0.634	10.952	***
	CHARIS3	0.839	0.777	0.042	0.604	11.618	***
	CHARIS4	1.001	0.805	0.049	0.648	10.603	***
Inspiring Subordinates Cronbach's alpha: 0.9299	INSPIRE1	1.343	0.920	0.048	0.847	17.074	***
	INSPIRE2	1.158	0.873	0.046	0.761	12.722	***
	INSPIRE3	1.120	0.822	0.050	0.675	14.050	***
	INSPIRE4	1.162	0.898	0.044	0.806	17.074	***
Intellectual stimulation Cronbach's alpha: 0.8407	INTELL1	1.000	0.711	0.057	0.505	13.394	***
	INTELL2	0.827	0.703	0.048	0.494	13.542	***
	INTELL3	1.125	0.837	0.051	0.701	9.432	***
	INTELL4	0.929	0.777	0.047	0.604	11.779	***
Strategic vision Cronbach's alpha: 0.9144	VISION1	1.088	0.853	0.045	0.728	12.846	***
	VISION2	1.179	0.822	0.052	0.676	13.745	***
	VISION3	1.252	0.942	0.044	0.887	6.950	***
	VISION4	1.033	0.803	0.047	0.645	14.123	***

*** = significant at the $p < 0.001$ level

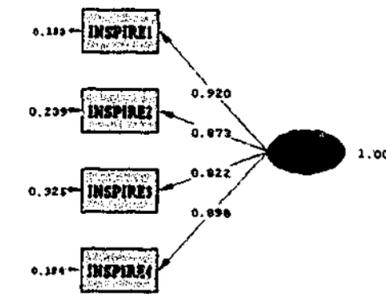
Inspiring subordinates

Indices resulting from the initial analysis for *inspiring subordinates* produced acceptable indications of fit for the GFI (0.985), the AGFI (0.927), the NNFI (0.979), the CFI (0.993) and the CAIC (74.318). However, unacceptable levels of fit were produced for the normed χ^2 (7.75) and the RMSEA (0.114). Examination of the errors, however, revealed that the variances for Item 1 (0.316) and Item 4 (0.332) were similar in size. In order to gain an additional degree of freedom, these error variances were constrained to be equal and, given

that the purpose of the analysis is to confirm scales from the existing literature, this procedure was deemed to be acceptable⁸¹. Results of the subsequent analysis are contained in Table 6-7 and, overall, indicate acceptable levels of fit. The normed χ^2 improved to 5.201 and the RMSEA improved to 0.090, both only marginally exceeding the upper level of acceptability.

Factor loadings for all the dimensions of *inspiring subordinates* are contained in Table 6-8. Observation of Table 6-8 reveals that that all standard errors are acceptable and parameters are significant at the $p < 0.001$ level (t -values > 3.3). Cronbach's alpha for the four-item scale was 0.9299 and assessed to be acceptable. Overall there is evidence to support the model as an adequate measure of *inspiring subordinates* using four indicators. Figure 6-6 contains a diagrammatic representation of the measurement model with standardised parameter estimate values (with indicators numbered and labelled as 'INSPIRE').

Figure 6-6 Inspiring subordinates: First-order measurement model



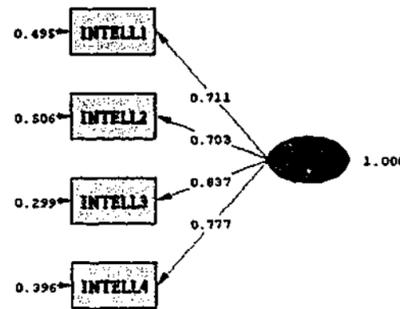
Intellectual stimulation

The measurement model for *intellectual stimulation* was run with four indicators. The fit indices resulting from this analysis are contained in Table 6-7 and all appear to be acceptable with χ^2 (2, $n = 539$) = 5.772, $p < 0.050$, $\chi^2/df = 2.885$, GFI = 0.995, AGFI = 0.973, NNFI = 0.986, CFI = 0.995, RMSEA = 0.059 and CAIC = 64.089 (saturated model = 72.897). Factor loadings for all the dimensions of *intellectual stimulation* are contained in Table 6-8, while Figure 6-7 contains the measurement model (with indicators numbered and labelled as 'INTELL'), including standardised parameter estimate values. Observation of Table 6-8 reveals that all standard errors are acceptable and parameters are

⁸¹ Refer to a discussion of this procedure in Section 5.3.2.

significant at the $p < 0.001$ level (t -values > 3.3). Cronbach's alpha for the four-item scale was assessed to be acceptable at 0.8407. Overall there is evidence to support the model as an adequate measure of *intellectual stimulation* using four indicators.

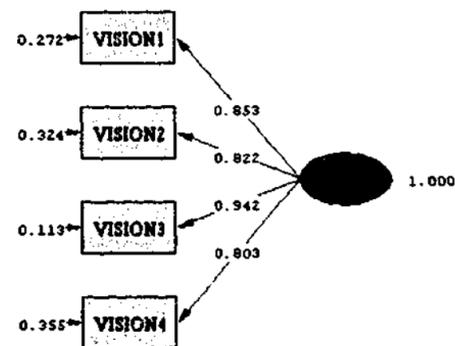
Figure 6-7 *Intellectual stimulation: CFA measurement model*



Strategic vision and articulation

The measurement model for *strategic vision and articulation* was run with four indicators. The fit indices resulting from this analysis are contained in Table 6-7 and all appear to be acceptable, with $\chi^2 (2, n = 539) = 9.452$, $p < 0.009$, $\chi^2/df = 4.726$, GFI = 0.991, AGFI = 0.955, NNFI = 0.986, CFI = 0.995, RMSEA = 0.085 and CAIC = 68.014 (saturated model = 72.897). Parameter estimates for all the dimensions of *Strategic vision and articulation* are contained in Table 6-8, while Figure 6-8 contains the measurement model (with indicators numbered and labelled as 'VISION'), including standardised parameter values. Observation of Table 6-8 reveals that all standard errors are acceptable and parameters are significant at the $p < 0.001$ level (t -values > 3.3). Cronbach's alpha for the four-item scale was 0.9144 and assessed to be acceptable. Overall there is evidence to support the model as an adequate measure of *strategic vision* using four indicators.

Figure 6-8 *Strategic vision and articulation: First-order measurement model*



6.3.2 Second-order measurement model

All indicators of the latent first-order measurement models for the dimensions of *transformational leadership* satisfied tests of validity and reliability and none was eliminated to this stage. Four variables identified in the literature as dimensions of *transformational leadership* remain following assessment of measurement models. They are *charisma*, *inspiring subordinates*, *intellectual stimulation* and *strategic vision*.

However, tests for the existence of multicollinearity reveal cause for concern. Two indicators produce *VIF* statistics in excess of the designated 5.5 level of acceptability. They are *INSPIRE1* (*VIF* of 6.464) and *VISION2* (*VIF* 5.560) and these items were omitted from further statistical analysis. In addition, *INTELL2* produced a *Condition Index* value of 34.866 along with a *Variance Proportion* of 0.48 (close to the cut-off of 0.50). This indicator was also deleted from further analysis. Following deletion of these three items no further collinearity problems were revealed.

SEM for the *transformational leadership* second-order measurement model run initially produced a solution that was not admissible⁸². Investigation revealed a negative error term for the variance of the residual term for *intellectual stimulation* (-1.158) and is identified as an 'offending estimate' (Hair *et al.* 1998). Since this is a low negative value and since the model tested is a measurement model (and not the final structural model), *intellectual stimulation* as a dimension of *transformational leadership* was eliminated from further analysis. Justification for the elimination of this dimension is also found in the literature. In support of this deletion, Yukl (1999, pp. 288-289) states,

Intellectual stimulation is operationally defined as causing a subordinate to question traditional beliefs, to look at problems in a different way, and to find innovative solutions to problems. The content of this dimension is diverse and ambiguous. There is not a clear description of what the leader actually says or does to influence the cognitive processes or behaviour of subordinates.

⁸² A non-admissible solution is one which results in parameters that are 'unreasonable' and fall outside a feasible range (Gerbing & Anderson 1987). A typical example is a negative variance, a 'Heywood case', deemed to be theoretically inappropriate. Hair *et al.* (1998) indicates that cases must be corrected before the model can be interpreted and goodness-of-fit assessed.

Thus, since there is overlap between *intellectual stimulation* and other dimensions of *transformational leadership*, and given literature support for the remaining dimensions of *transformational leadership*, elimination of this dimension is judged to be acceptable. A diagrammatic representation of the second-order measurement model for *transformational leadership* is contained in Figure 6-9 (with indicators labelled in the same way as for first-order models) and includes standardised parameter values. The resulting fit indices for the revised 3-factor second-order model of *transformational leadership* are presented in Table 6-9 and indicate acceptable fit. While the normed χ^2 of 4.922, exceeds the upper limit of 3 (indicating too many parameters in the model) and the RMSEA slightly exceeds the acceptable upper limit of 0.8, other measures indicate adequate levels of fit for the purposes of CFA. The absolute fit indices all exceed 0.9 and the relative fit indices exceed 0.95. The CAIC for the estimated model is smaller than the saturated model, indicating good fit and that parameter estimates from the sample will cross-validate in future samples (Bandalos 1993).

Examination of the factor loadings for first-order measurement models in Table 6-10 reveal that all standard errors are satisfactory and factor loadings are statistically significant at the $p < 0.001$ level (t -values > 3.3). Structural equation loadings and SMCs are presented in Table 6-10 and observation reveals that all statistics are satisfactory. Overall, therefore, there is support for the second-order model for *transformational leadership* comprising three first-order models.

Table 6-9 Transformational leadership (TL): Second-order fit indices

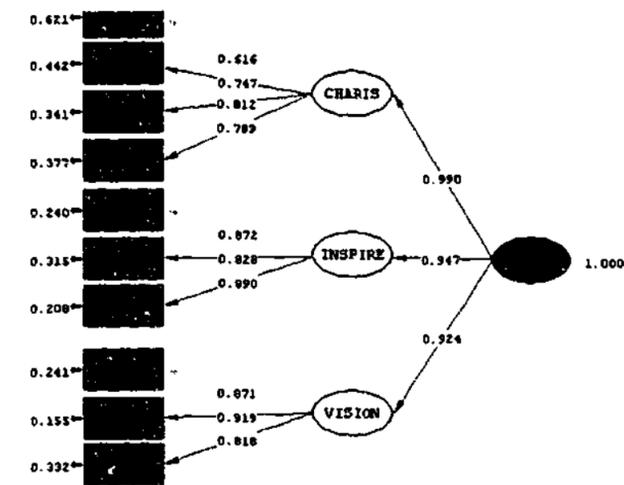
Index/Model	χ^2	df	N	P	χ^2/df	GFI	AGFI	RMSEA	NNFI (TLI)	CFI	CAIC (saturated model)
TL	157.509	32	539	<0.001	4.922	0.9412	0.900	0.089	0.958	0.970	334.545 (400.934)

Table 6-10 Transformational leadership: Structural equation loadings

Scale	Standardised Parameter estimate	SE	SMC	t-value	
Charisma	0.990	0.065	0.981	15.155	***
Inspiring subordinates	0.947	0.041	0.897	22.997	***
Strategic vision	0.924	0.042	0.854	22.286	***

*** = significant at the $p < 0.001$ level

Figure 6-9 Transformational leadership: Second-order model



Thus, results of statistical testing provide support for the conceptualisation of *transformational leadership* as a multidimensional variable, with each of the first-level variables achieving adequate construct validity. However, while there is theoretical support for *transformational leadership* as a second-order variable, weaknesses have been identified in its measurement. Dimensions of *transformational leadership* have been identified as 'substantially intercorrelated' and that,

... a single transformational factor which combines them may satisfy the needs for parsimony in some research (Bass 1999, p.20).

Thus, it was deemed appropriate to undertake tests of multicollinearity. Results of this testing showed that one indicator in each of three dimensions produced statistics that exceeded the minimum acceptable level and these indicators were eliminated from further analysis. As a result of this modification process, all four hypothesised dimensions of *transformational leadership* were incorporated into the final model for the testing of construct validity, each with a minimum of three indicators.

Testing of the second-order model for *transformational leadership* initially produced a solution that was not admissible. Investigation revealed a negative error term, identified as an 'offending estimate', for the variance of the residual term for *intellectual stimulation*. As a result, *intellectual stimulation* was eliminated from further analysis. This procedure is justified with reference to the literature on *transformational leadership* where the operational definition for *intellectual stimulation* has been identified as problematic in terms of its ambiguity and overlap with other dimensions (Yukl 1999). Thus, while it has

not been necessary to collapse *transformational leadership* into a single dimension. Statistical testing of the adequacy of the second-order model led to a reduction of the number of dimensions to three. Given literature support for the remaining dimensions of *transformational leadership*, this procedure is judged as satisfactory and *transformational leadership* can be incorporated into the structural model for hypothesis testing (described in Chapter 7).

6.4 Antecedents to psychological empowerment

Five variables are hypothesised to affect *psychological empowerment*. They are *value of strategic information*, *availability of resources*, *locus of control*, *role clarity* and *self-esteem*. Each of these was measured using first-order measurement models with four indicators to assess their unidimensionality. Table 6-11 contains SMCs produced from SEM analysis run using all four indicators. Items with low SMCs are presented in bold format). Observation of this table reveals that three of the variables achieved an adequate number of indicators with SMCs exceeding 0.3. They are *value of strategic information*, *availability of resources* and *role clarity*. Two of the variables produced unacceptable SMCs for two or more indicators, thereby rendering them both unsuitable for further statistical analysis. They are *internal locus of control* and *self-esteem*. Each of the five variables is discussed in turn. Sample covariance matrices for the three antecedents that survive confirmatory factor analysis can be observed in Appendix E.

Table 6-11 Antecedents to psychological empowerment: Initial scale assessment

Item/ Scale	SMC Item 1	SMC Item 2	SMC Item 3	SMC Item 4	Item for deletion
<i>Value of strategic information</i>	0.586	0.585	0.682	0.398	nil
<i>Availability of resources</i>	0.645	0.530	0.568	0.016	4
<i>Locus of control</i>	0.610	0.095	0.000	0.012	Entire scale
<i>Role clarity</i>	0.331	0.384	0.538	0.314	nil
<i>Self esteem</i>	0.048	0.045	0.695	0.476	Entire scale

6.4.1 Value of strategic information

The measurement model for *value of strategic information* was run with four indicators and the resultant SMCs can be observed in Table 6-11, all proving to be acceptable. The fit indices resulting from analysis of the measurement model are contained in Table 6-12 and all appear to be acceptable, with $\chi^2 (2, n = 539) = 3.813, p < 0.146, \chi^2/df = 1.907$.

GFI = 0.996, AGFI = 0.982, CFI = 0.998, RMSEA = 0.041, NNFI (TLI) = 0.993 and CAIC = 62.159 (saturated model = 72.897). Parameter estimates for the dimensions of *value of strategic information* are contained in Table 6-13. Observation of Table 6-13 reveals that all standard errors are acceptable and estimated parameters are significant at the $p < 0.001$ level (t -values > 3.3). Cronbach's alpha for the three-item scale was assessed to be acceptable at 0.8250. Overall there is evidence to support the hypothesised model as an adequate measure of *value of strategic information* using four indicators. Figure 6-10 contains the measurement model with standardised parameter estimates (indicators numbered and labelled as 'INFO').

Table 6-12 Antecedents of psychological empowerment: Fit indices (after item deletions)

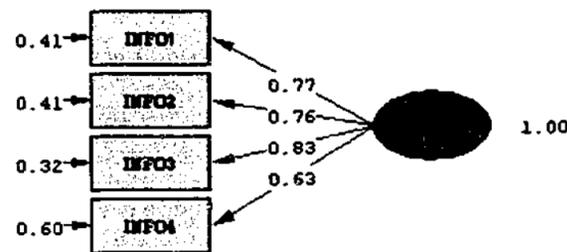
Index/ Model	χ^2	df	N	p	χ^2/df	GFI	AGFI	RMSEA	NNFI (TLI)	CFI	CAIC (saturated model)
<i>Value of strategic information</i>	3.813	2	539	0.146	1.907	0.996	0.982	0.041	0.993	0.998	62.159 (72.897)
<i>Availability of resources</i>	0.732	1	539	0.392	2.99	0.999	0.995	0.001	1.002	1.000	37.180 (43.738)
<i>Role clarity</i>	2.423	2	539	0.298	1.212	0.998	0.989	0.021	0.997	0.999	60.791 (72.897)

Table 6-13 Antecedents to psychological empowerment: First-order factor loadings

Scale	Indicator	Parameter estimate	Standardised parameter estimate	SE	SMC	t-value	
<i>Value of strategic information</i> Cronbach's alpha: 0.8250	INFO1	0.918	0.766	0.047	0.586	19.440	***
	INFO2	0.844	0.765	0.044	0.585	19.412	***
	INFO3	1.148	0.826	0.054	0.682	21.479	***
	INFO4	0.945	0.631	0.063	0.398	15.129	***
<i>Availability of resources</i> Cronbach's alpha: 0.8048	RESOURC1	1.218	0.786	0.060	0.618	20.402	***
	RESOURC2	1.180	0.730	0.068	0.532	17.434	***
	RESOURC3	1.153	0.770	0.058	0.592	19.744	***
<i>Role clarity</i> Cronbach's alpha: 0.6971	ROLCLAR1	0.700	0.575	0.057	0.331	12.209	***
	ROLCLAR2	0.665	0.620	0.050	0.384	13.214	***
	ROLCLAR3	0.653	0.734	0.042	0.538	15.606	***
	ROLCLAR4	0.769	0.561	0.065	0.314	11.876	***

*** = significant at the $p < 0.001$ level

Figure 6-10 Value of strategic information: First-order measurement model

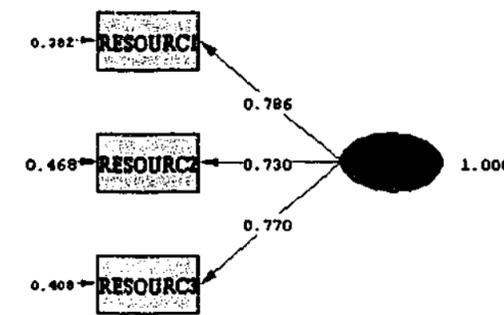


6.4.2 Availability of resources

The measurement model for *availability of resources* was run initially with its four hypothesised indicators, and resulting SMCs for each of the indicators are contained in Table 6-11, indicating that Item 4 was inadequate (SMC 0.016). The measurement question reads, 'Lack of resources is a *barrier* to proper management of my school' (emphasis added) and differs from the others in the set due to its negative wording. In addition, the item seems to be worded too strongly in comparison with the other indicators. Its deletion is justified.

The measurement model for *availability of resources* was run again with three indicators. In order to produce an overidentified model, the error variances of Item 1 (0.846) and Item 3 (0.976) were constrained to be equal since their values most closely approximated each other. The fit indices resulting from this analysis are contained in Table 6-12 and all appear to be acceptable, with $\chi^2(1, n = 539) = 0.732, p < 0.392, \chi^2/df = 2.99, GFI = 0.999, AGFI = 0.995, CFI = 1.000, NNFI (TLI) = 1.002, RMSEA = 0.001$ and $CAIC = 37.180$ (saturated model = 43.738). Parameter estimates for all the dimensions of *availability of resources* are contained in Table 6-13, while Figure 6-11 contains the measurement model with standardised parameter estimates (indicators numbered and labelled as 'RESOURC'). Observation of Table 6-13 reveals that that all standard errors are acceptable and parameters are significant at the $p < 0.001$ level (t -values > 3.3). Cronbach's alpha for the three-item scale was acceptable at 0.8250. Overall there is evidence to support the model as an adequate measure of *availability of resources* with three indicators and this variable can be incorporated into the structural model for hypothesis testing.

Figure 6-11 Availability of resources: First-order measurement model



6.4.3 Internal locus of control

The measurement model for *locus of control* was run initially with four indicators. Only one of these indicators produced an SMC exceeding the acceptable criterion of 0.3. In addition, *internal locus of control* produced a Cronbach's alpha score of only 0.29, a value that falls well short of the acceptable level of 0.7. As a consequence of this analysis, *locus of control* was eliminated from further empirical testing. Data analysis does not provide adequate measurement for the independent variable *internal locus of control*. While the inability to measure the concept adequately does not amount to a rejection of the measurement of *internal locus of control*, for the purpose of this thesis it cannot be incorporated into further analyses.

In her analysis of the effects of 'locus of control' on *psychological empowerment* Spreitzer (1995a) does not report reliability statistics, merely indicating that the reliability for the measure was 'marginal' and that 'locus of control' was not significantly related to empowerment. Spreitzer commented,

... the items [in the 'locus of control' scale] might have been too general to relate to issues of empowerment (an example is, 'Do you believe you can stop yourself catching a cold?' (Spreitzer 1995a, p. 145).

Therefore, in place of the indicators used by Spreitzer, those developed by Hodgkinson (1992) were thought to be more appropriate. This 16-item instrument was developed to measure the *locus of control* of managers in a work context. Despite the use of this scale, however, reliability scores again produced poor results, tests of validity and reliability producing statistics that are unacceptable. In addition, consistent with the decision to minimise the size of the survey form, only four indicators were used to measure *internal locus of control*. Given the results produced by Spreitzer (1995a), this result is not

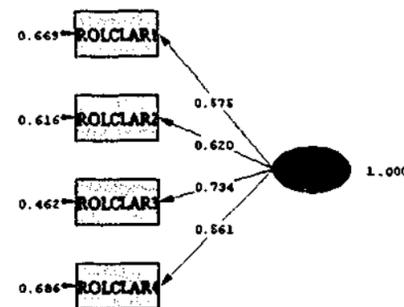
surprising.

Thus, there are two likely explanations for the lack of adequacy of the instrument used to measure *internal locus of control*. The possible inappropriateness of the Hodgkinson (1992) instrument, combined with the reduced number of measurement questions, may account for the inability to produce adequate measurements for *internal locus of control* in this thesis. While there is no evidence to reject *Hypothesis 1-1*, inability to measure *internal locus of control* does not allow testing of the hypothesis and it cannot be incorporated into the structural model.

6.4.4 Role clarity

The measurement model for *role clarity* was run with four indicators and the resultant SMCs can be observed in Table 6-13; all produced acceptable levels. The fit indices are contained in Table 6-12 and appear acceptable, with $\chi^2 (2, n = 539) = 2.423, p < 0.298, \chi^2/df = 1.212, GFI = 0.998, AGFI = 0.989, NNFI (TLI) = 0.997, CFI = 0.999, RMSEA = 0.021$ and $CAIC = 60.791$ (saturated model = 72.897). Parameter estimates for all the dimensions of *role clarity* are contained in Table 6-13, while Figure 6-12 contains the measurement model showing standardised parameters (indicators numbered and labelled as 'ROLCLAR'). Observation of Table 6-13 reveals that that all standard errors are acceptable and parameters are significant at the $p < 0.001$ level (t -values > 3.3). Cronbach's alpha for the three-item scale was 0.6971 and assessed to be acceptable, given the close proximity to the minimum-acceptable limit of 0.7. Overall there is evidence to support the hypothesised model as an adequate measure of *role clarity* using four indicators and this variable can be incorporated into the structural model to complete hypothesis testing (refer to discussion in Chapter 7).

Figure 6-12 Role clarity: First-order measurement model



This result is consistent with the findings of Spreitzer (1996), who found that if people do not know the extent of their authority they will hesitate to act, feel unable to make a difference, be low in self-confidence and be fearful of potential repercussions for decisions made under ambiguous authority. Hypothesis testing in this thesis supports this view and suggests that principals with a clear idea of their role will have stronger feelings of empowerment than those whose perceptions are more ambiguous.

Since the introduction of *Schools of the Future*, the role of principals has changed in terms of the level of control they have over the management of their schools. As outlined in Chapter 2, the role of the principal has changed. They now enjoy more autonomy and control many aspects of management, including staff selection, control over administrative structure, student recruitment and use of resources. The results of hypothesis testing suggest that, in order to feel more empowered, principals need to gain a clear idea of their role under this new structure. This can be obtained through education and training aimed at providing both principals and aspirants with a full understanding of the role of principal and the techniques and strategies required to fulfil the role adequately.

6.4.5 Self-esteem

The measurement model for *self-esteem* was run initially with four indicators. Only two of these indicators produced SMCs exceeding the acceptable criterion and the entire scale produced a Cronbach's alpha score of only 0.5206, a value that falls well short of the acceptable level of 0.7. Since measurement models require a minimum of three indicators, there is no support for the measurement of this variable. Thus, data analysis does not support the measurement for self-esteem in this thesis and this variable cannot be included in the structural model.

One possible reason for the inability to measure *self-esteem* is that an insufficient number of items was used to measure this variable. Previous measures of self-esteem used dichotomous 'true/false' statements (Spreitzer 1995a, Mulaik & James 1995). Only four of these were adapted for use in this thesis, based on their perceived appropriateness. The purpose of limiting the number of indicators in this way to an arbitrary number of items was to minimise the size of the survey form and to maximise the response rate. There is a strong possibility that four items is an insufficient number to measure *self-esteem* adequately.

Another explanation for inability to measure *self-esteem* adequately is that the questions selected were inappropriate for school principals. The purpose of Coopersmith's (1967) inventory is for psychological testing and, for example, the question 'I'm a lot of fun to be with' may not be as relevant to a school principal as it may be in other contexts (for patients of a psychoanalyst, for example). In addition, in a survey instrument in which most other questions relate to management issues, personality-type questions such as those used to measure *self-esteem* in the education setting may appear inappropriate and intrusive. Indeed, one respondent indicated as much by way of a note written on the survey instrument.

6.5 Antecedents to transformational leadership

Three variables are hypothesised to affect *transformational leadership*. While the most important of these is *psychological empowerment*, two other variables were introduced to reduce the possibility of specification error. That is, as many variables identified in the literature that could affect *transformational leadership* were included to minimise the error that arises from omitting important variables (Kline 1998). The two additional variables are *need for achievement* and *risk profile*. SMCs produced from each of these measurement models are contained in Table 6-14.

Table 6-14 Scale assessment: Antecedents of transformational leadership⁸³

Item/ Scale	SMC Item 1	SMC Item 2	SMC Item 3	SMC Item 4	Item for deletion	Cronbach's alpha
<i>Need for achievement:</i>						
<i>Mastery</i>	0.123	0.167	0.176	0.099	Entire scale	0.3905
<i>Pursuit of excellence</i>	0.069	0.479	0.107	0.160	Entire scale	0.4078
<i>Risk profile</i>	0.052	0.279	0.017	0.550	Entire scale	0.2717

6.5.1 Psychological empowerment

Detailed discussion on the measurement of this variable is contained in Section 6.2.

6.5.2 Need for achievement

Need for achievement is the personal striving of individuals to attain goals within their social environment. *Need for achievement* is hypothesised as a second-order model,

⁸³ Not including *psychological empowerment*

comprising two first-order models comprising 4 indicators. They are *mastery* and *pursuit of excellence* and are defined as follows.

Mastery is the reinforcing properties of problem solving, of tackling the difficult task and succeeding in the face of difficulty.

Pursuit of excellence is competition with a standard of excellence.

As shown in Table 6-14, neither of the first-order indicators produced acceptable SMCs. *Mastery* failed to achieve adequate SMCs for all of its indicators, while *pursuit of excellence* achieved the criterion for only one item (Item 2, SMC 0.49). In addition, reliability analyses produced a Cronbach's alpha score of 0.3905 for *mastery* and 0.4078 for *pursuit of excellence*, well short of the acceptable criterion of 0.7. Since it was determined that the preferred minimum number of indicators is three, *mastery* and *pursuit of excellence* were eliminated from further analysis, along with the second-order measurement model for *need for achievement*.

Thus, data analysis failed to provide adequate measurement for either *mastery* or *pursuit of excellence* and, as a result, no support can be argued for the overarching variable *need for achievement*. It cannot be incorporated into the structural model. Since the main focus of this thesis is to investigate the effects of *psychological empowerment*, however, the inability to incorporate *need for achievement* does not compromise the structural model or the research question.

A possible explanation for the failure to achieve adequate measurement for these variables is that public school principals may not share the same attitudes or perceptions of the dimensions of *need for achievement* (*mastery* and *pursuit of excellence*) as private sector managers. In theoretical terms, these dimensions link closely with attitudes to competitiveness⁸⁴. It is possible that the problem stems from values held by principals that relate to factors other than competitiveness and therefore these variables do not hold the same levels of resonance with these actors. Thus, implementation of *Schools of the Future*, designed to promote a business approach to management and increasing levels of competition into, and between schools may not have impacted upon principals' cognitions. Underpinnings of *pursuit of excellence* and *mastery* may still be steeped in the more

⁸⁴ Refer to Section 3.7.3 for a discussion of these variables.

traditional understanding of these concepts, emphasising cooperation and common good among students and between schools operating within the public system. With the failure of *need for achievement* to achieve measurement adequacy, neither it nor its dimensions is incorporated into the structural model.

6.5.2 Risk profile

Of the four indicators for *risk profile*, only one achieved an acceptable SMC statistic (Item 4, SMC 0.55). In addition, reliability analyses produced a Cronbach's alpha score of only 0.2717, well short of the acceptable criterion of 0.7. Since each latent variable requires a minimum of three indicators, data analysis does not support the measurement of risk profile, due to an inability to provide adequate measurement of the independent variable. This scale was eliminated from further consideration.

Considering that principals of public schools have, mostly, spent the majority of their working lives as public servants, it is not surprising that no consistent pattern of risk profile is apparent within the sample. As managers, principals had no exposure to private sector competition until 1995 with the introduction of *Schools of the Future* and the experience of operating within a competitive environment is new to them. Thus there is some justification for the elimination of this variable from further consideration. Omission of *risk profile* does not compromise testing the structural model, since the purpose of its inclusion was to minimise specification error. Nonetheless, it is not possible to incorporate this variable into the structural model.

6.6 The outcome variable

The outcome variable in the model, *innovation in management structure*, is measured using a single-factor item: 'The principal actively promotes innovation in management structures within this school.' Since this is not a multi-item scale, discussion of construct validity and reliability is unnecessary and no refinement of the scale was required.

6.7 Calculation of scores for composite variables

Following the scale evaluation procedure outlined above, the analysis can proceed with the following measurement models: *Psychological empowerment* with 3 dimensions, *transformational leadership* with 3 dimensions, three antecedents to *psychological empowerment* and a single-measure item for *innovation in management structure*. Table

6-15 contains the list of these latent variables, along with the number of indicators for each as well as the final Cronbach's alpha scores.

The purpose of developing and testing measurement models was to establish latent variables for use in the structural model used for hypothesis testing. It stands as the first of a two-stage process. Valid and reliable scales can now be collapsed into composites and incorporated into structural models to complete the second phase of the testing process. Composite items were constructed for this thesis by calculating the means of the univariate items remaining following tests of validity and reliability. Results of stage two analyses are contained in the following chapter, Chapter 7.

Table 6-15 Statistics for latent variables following CFA

Scale	Number of indicators	Cronbach's alpha	Scale Variance	Mean	Standard deviation	Min.	Max.
Psychological empowerment							
<i>Competence</i>	3	0.838	0.555	6.067	0.745	2.00	7.00
<i>Impact</i>	3	0.776	0.408	6.173	0.639	2.00	7.00
<i>Self-determination</i>	3	0.756	1.080	5.259	1.039	1.50	7.00
Transformational leadership							
<i>Charisma</i>	4	0.825	0.941	5.903	0.970	1.50	7.00
<i>Inspiring subordinates</i>	3	0.930	1.459	5.366	1.239	1.00	7.00
<i>Strategic vision and articulation</i>	3	0.914	1.407	5.614	1.189	1.00	7.00
Antecedents to psychological empowerment							
<i>Value of strategic information</i>	4	0.825	1.121	5.303	1.059	1.00	7.00
<i>Availability of resources</i>	3	0.805	1.741	4.388	1.319	1.00	7.00
<i>Role clarity</i>	4	0.697	0.695	5.796	0.834	3.00	7.00
<i>Innovation in management structure</i>	1	n/a	1.904	5.393	1.380	1.00	7.00

Table 6-16 contains the correlation matrix of the composite variables used for analysis of the final model using structural equation modelling (SEM). Although the SEM analyses of measurement models and the structural model were undertaken using variance/covariance matrices⁸⁵, it is appropriate to include correlation statistics when reporting SEM results (Hoyle & Panter 1995).

⁸⁵ A discussion on the choice between use of variance/covariance matrices and correlation matrices is contained in Section 5.2.3.

Table 6-16 Pearson correlation matrix of key variables

	1	2	3	4	5	6	7	8	9	10	
Information	1	1.000									
Significance (2-tailed)											
Resources	2	.202**	1.000								
Significance (2-tailed)		0.000									
Role clarity	3	.273**	.396**	1.000							
Significance (2-tailed)		0.000	0.000								
Competence	4	.117**	.268**	.512**	1.000						
Significance (2-tailed)		0.006	0.000	0.000							
Impact	5	.119**	.237**	.437**	.507**	1.000					
Significance (2-tailed)		0.006	0.000	0.000	0.000						
Self determination	6	.134**	.478**	.479**	.313**	.383**	1.000				
Significance (2-tailed)		0.002	0.000	0.000	0.000	0.000					
Inspiration	7	.014	0.061	0.058	0.062	.094*	.130**	1.000			
Significance (2-tailed)		0.752	0.156	0.178	0.152	0.028	0.002				
Intelligence	8	.024	0.016	0.058	0.052	0.077	.093*	.826**	1.000		
Significance (2-tailed)		0.572	0.719	0.182	0.230	0.075	0.030	0.000			
Vision	9	.021	0.066	0.049	0.072	.091*	.118**	.876**	.822**	1.000	
Significance (2-tailed)		0.620	0.126	0.257	0.095	0.035	0.006	0.000	0.000		
INMGT	10	.041	0.007	0.078	0.079	0.068	0.076	.655**	.708**	.692**	1.000
Significance (2-tailed)		0.337	0.871	0.069	0.067	0.114	0.076	0.000	0.000	0.000	

* significant to the 0.01 level ** significant to the 0.001 level

6.8 Limitations and assumptions of scale development

This section contains a discussion of the limitations and assumptions involved in the development of scales to measure the hypothesised latent variables. The measurement models developed to test the structures were developed using a confirmatory modelling strategy and original scales used to measure the variables in this study were adapted from those found in the literature. Modifications were made to these indicators so that they provided items that were more suitable for this project, made sense to respondents and kept survey forms to manageable levels. Any such modifications, however, have the potential to alter the validity of these scales. These changes require consideration and they are discussed in this section.

Some modifications were made to measurement questions. First, some scales were adapted from items comprising dummy variables (for example, *locus of control*) that required 'yes' or 'no' responses. These were re-written to conform to the 7-item Likert scale format common to all other measurement models contained in this project. Problems

associated with this approach relate to whether the integrity of the original scale was preserved in the indicators used in the statistical analyses. This may account for the number of variables that failed to meet acceptable levels of reliability and validity.

Second, some of the indicators were re-worded to make more sense to the participants in this project, namely Victorian State *Department of Education, Employment and Training* Principal Class Officers. An example of this is the re-wording of the *value of strategic information* variable. Rather than asking principals whether they had access to information about the strategic direction of their organisation (that is, school) and whether they were provided with information that indicated the extent of their success in achieving stated goals, principals were asked about their perceptions about the usefulness of the *School Charter* process introduced as part of the *Schools of the Future* initiative. The *School Charter* process is one where principals devise strategic goals and receive feedback on their success in attaining those goals on a triennial basis. It is one of the accountability measures introduced as a mandatory part of *Schools of the Future*. Thus, all principals are required to develop strategies for their schools and to participate in the triennial reviews. This is a different situation from that encountered by Spreitzer whose participants (insurance managers) either did, or did not, have access to information regarding the strategic direction of their organisation. While the modifications made to the original indicators were necessary due to the different research environment (and the final measures are, arguably, an improvement to the original variable) such changes create a scale that is different from that used previously. Similarly, the measurement items used to measure *internal locus of control* were not those used by Spreitzer, instead being taken from a scale that measured strategic locus of control. This point is discussed in more detail in Section 6.4.3.

Third, the initial number of indicators for each hypothesised scale developed for analysis was limited to a maximum of four. The purpose of this approach was to keep the number of questions to a minimum, thereby maximising the number of survey returns from raters. This is an important consideration given the large required number of responses necessary to undertake SEM analyses. However, some variables obtained from the literature comprised many more indicators than were practicable for inclusion in this project and constraining the number of indicators to a total of four for each latent variable may have compromised these scales. An example of this problem is, again, the *self-esteem* scale. The original Coopersmith (1967) scale comprised 17 indicators, whereas only the four

deemed to be most appropriate for principals were included in the scale.

6.9 Chapter summary

The purpose of this chapter is to present the analysis of the scales used to measure the latent variables comprising the model hypothesised in this study and to identify which scales meet minimum requirements for structural equation modelling. This analysis stands as the first part of a two-stage process: assessing and refining measurement models using confirmatory factor analysis. This chapter contains the results of that process. Results of tests indicate that adequate scales can be constructed for three of the dimensions of *psychological empowerment*, three dimensions of *transformational leadership* and three antecedents to *psychological empowerment*, each of which satisfied tests of reliability and validity.

The second part of the two-stage process involves the testing of the hypothesised structural model comprising the latent variables described in this chapter. The composite scales created (using a process that averages the relevant indicators) are brought into the model construction phase of the thesis that leads to the testing of the hypotheses. Discussion of the model-building and model-testing stage is the subject of the next chapter, Chapter 7.

Chapter 7

Hypothesis testing: Structural model

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Chapter 7

Hypothesis testing: Structural model

7.1 Introduction

The purpose of this chapter is to report the results of hypothesis testing undertaken following structural model development. Hypotheses developed in Chapter 3 were operationalised with measurement models developed, refined and tested using confirmatory factor analysis in Chapter 6. Hypothesis testing is achieved first by developing and assessing the structural model for fit and then parameter estimates are examined to test the strength and significance of the relationships between key variables. The following chapter, Chapter 8, contains a discussion of the theoretical and practical conclusions of the thesis, as well as a discussion of the implications of the research results.

The remainder of this chapter is set out as follows. The next section, Section 7.2, contains a review of the hypotheses central to this thesis, followed by Section 7.3 containing a discussion of normality, indicating areas of concern. The model that summarises these hypotheses is contained in Section 7.4, while Section 7.5 contains the results of the testing of fit for this model. Results of hypothesis testing are presented in Section 7.6. The chapter concludes with a summary in Section 7.7.

7.2 Review of hypotheses

The purpose of this thesis is to investigate the role of the *psychological empowerment* of managers in affecting the extent of their *transformational leadership*. Additionally, the effects of five antecedents to *psychological empowerment* are hypothesised, as well as the effects of *transformational leadership* on *innovation in management structure*. A link between *innovation in management structure* and desirable management outcomes is also hypothesised in this thesis although it is not tested due to the difficulties inherent in measuring these outcomes. In order to limit the possibility of specification error, two additional variables were hypothesised, along with *psychological empowerment*, to affect *transformational leadership*. They are *risk profile* and *need for achievement*.

Following testing of measurement models using confirmatory factor analysis (CFA), certain of the variables failed to meet the adequacy criteria, resulting in their elimination from further consideration. Two of the antecedents to *psychological empowerment*

(*internal locus of control* and *self-esteem*) were eliminated due to measurement problems. The remaining antecedents are *value of strategic information*, *availability of resources*, and *role clarity*. Two of the antecedents to *transformational leadership* (*need for achievement* and *risk profile*) were eliminated as well, leaving *psychological empowerment* as the only predictor of *transformational leadership*. In measuring *psychological empowerment*, the meaning dimension was eliminated⁸⁶, leaving *competence*, *impact* and *self-determination* as the dimensions of *psychological empowerment*. In measuring *transformational leadership*, one of the dimensions was eliminated (*intellectual stimulation*), leaving *charisma*, *inspiring subordinates* and *strategic vision and articulation*. Figure 7-1 contains the path diagram describing the hypothesised model linking the remaining variables. Discussion of the procedures adopted in the scale development process and the rationale for elimination of certain variables is contained in Chapter 6.

Table 7-1 contains a summary of all the original hypotheses developed in Chapter 3, identifying those with variables that failed during the scale development process and those to be tested using structural equation modelling (SEM)⁸⁷. As a consequence, no support was established for hypotheses involving variables that failed to produce adequate scales. The hypotheses affected are those that link *self-esteem* and *internal locus of control* with *psychological empowerment* (hypotheses H₁₋₁ and H₁₋₂), and those linking *risk profile* and *need for achievement* with *transformational leadership* (hypotheses H₂₋₂ and H₂₋₃). Consequently, there is no support for these hypotheses.

⁸⁶ Omitting *meaning* as a dimension of *psychological empowerment* does not compromise its position as a key component of the overarching variable. Its omission was considered appropriate because of the inability to obtain adequate measurement due to high levels of negative skewness. This was felt to arise from the peculiar characteristics of the population of state school principals, the participants.

⁸⁷ The variables that achieved scale adequacy are shaded.

Table 7-1 Summary of hypotheses

Hypotheses describing links in the model		Scale adequacy?
Antecedents to <i>psychological empowerment</i>		
H ₁₋₁	The <i>internal locus of control</i> of state school principals is positively related to their <i>psychological empowerment</i> .	No
H ₁₋₂	The perception of <i>role clarity</i> of state school principals is positively related to their <i>psychological empowerment</i> .	Yes
H ₁₋₃	The <i>self-esteem</i> of state school principals is positively related to their <i>psychological empowerment</i> .	No
H ₁₋₄	The perception of the <i>value of strategic information</i> is positively related to the <i>psychological empowerment</i> of state school principals.	Yes
H ₁₋₅	The perception of <i>availability of resources</i> of state school principals is positively related to their <i>psychological empowerment</i> .	Yes
Antecedents to <i>transformational Leadership</i>		
H ₂₋₁	The <i>risk profile</i> of state school principals is positively related to their level of <i>transformational leadership</i> .	No
H ₂₋₂	The <i>psychological empowerment</i> of state school principals is positively related to their level of <i>transformational leadership</i> .	Yes
H ₂₋₃	The <i>need for achievement</i> of state school principals is positively related to their level of <i>transformational leadership</i> .	No
Antecedent to <i>innovation in management structure</i>		
H ₃	The level of <i>transformational leadership</i> of state school principals is positively related to the level of <i>innovation in management structure</i> experienced in a school	Yes

7.3 Assessing normality

Composite variables were constructed by calculating the means of the items remaining following tests of validity and reliability. Table 7-2 contains statistics relating to the distribution of the data for each of the univariate variables. Histograms derived from these scales are contained in Appendix F. Observation of Table 7-2 reveals that, consistent with the assessment of univariate normality (discussed in Section 4.8), there is a pattern of negative skewness for the composite items. It can be assumed that the overall pattern of the data is multivariate nonnormal⁸⁸.

⁸⁸ Refer to the discussion on multivariate normality in Section 5.4.3.

Figure 7-1 Hypotheses in final tested model

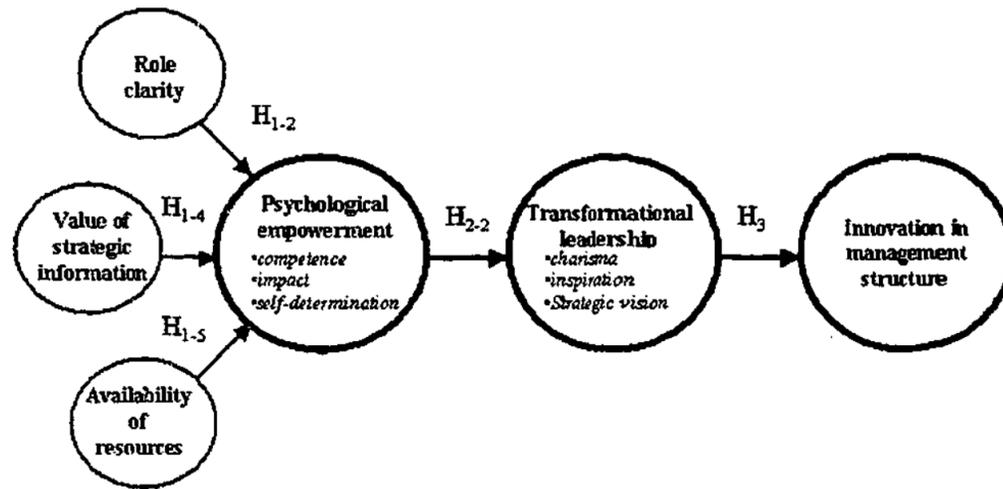


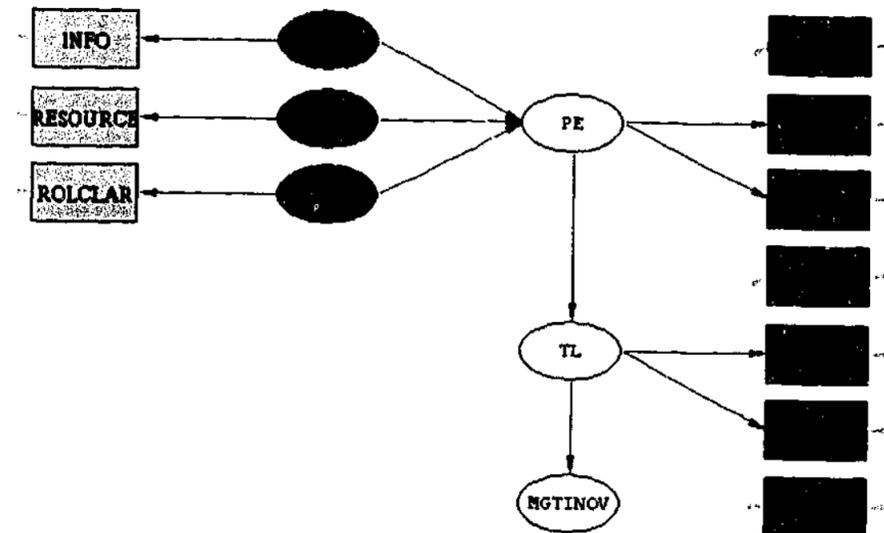
Table 7-2 Univariate normality statistics

Statistic/ Variable	Mean	Variance	Skewness	Kurtosis	Min.	Max.
Psychological empowerment						
Competence	6.067	0.555	-1.178	2.980	2	7
Impact	6.173	0.408	-1.051	3.629	2	7
Self-determination	5.259	1.080	-0.602	-0.215	2	7
Antecedents to psychological empowerment						
Value of strategic information	5.303	1.121	-0.927	0.903	1	7
Availability of resources	4.388	1.741	-0.404	-0.565	1	7
Role clarity	5.796	0.695	-0.748	0.427	3	7
Transformational leadership						
Charisma	5.903	0.941	-1.526	2.908	1	7
Inspiring subordinates	5.366	1.459	-1.189	1.425	1	7
Strategic vision & articulation	5.614	1.407	-1.312	1.879	1	7
Innovation						
Innovation in management structure	5.393	1.904	-0.995	0.862	1	7

7.4 The structural model

This section contains a description of the structural equation model developed to test the hypotheses developed in Chapter 3. In order to test the full model of *psychological empowerment*, *transformational leadership* and *innovation in management structure*, a structural model comprising all remaining variables was produced from the path diagram contained in Figure 7-1. The structural model used to test the hypotheses is contained in Figure 7-2. Observation of this diagram reveals the three antecedent (exogenous) latent variables to *psychological empowerment*, *value of strategic information* (INFORM), *availability of resources* (RES) and *role clarity* (CLARITY), are represented in rectangles on the left of the diagram and are shaded grey. The latent variables, representing the hypothesised endogenous (dependent) variables, *psychological empowerment*, (PE), *transformational leadership* (TL) and *innovation in management structure* (MGTI NOV), are represented as lightly shaded ellipses, coloured yellow. The items measuring the endogenous variables appear as lightly shaded rectangles to the right of the diagram, coloured aqua.

Figure 7-2 Path diagram for hypothesised structural model



Three of the exogenous latent variables (*INFORM*, *RES* and *CLARITY*) are each measured with one composite indicator, constructed using the process described in Section 5.4.1. They appear in figure 7-2 as ellipses and are coloured green. *Psychological empowerment* and *transformational leadership* are second-order model variables. Each is measured

using three measurement items that, in turn, are also constructed using the mean of measurement items. Observation of the columns in Table 7-3 reveals, for each of the measurement items, the measurement item's designation in the path model, whether it is a first-order or second-order measurement item, the number of indicators used to measure it, its Cronbach's alpha value and its scale variance.

Since the testing of hypotheses is conducted as a two-stage process (first developing measurement models and second testing a structural model) it is necessary to constrain the measurement models in the second stage when the structural model is estimated. This process is explained in Hair *et al.*, (1998). To constrain the reliability of an indicator in this way it is necessary to specify the error term of that variable as 1 minus the correct reliability value⁸⁹. The right-hand column in Table 7-3 contains the value to which the error variances for each of the composite variables are constrained. It is calculated as the variance of the observed variable multiplied by (1 minus its reliability⁹⁰).

The final outcome measurement variable, *innovation in management structure (MGTINOV)*, is measured directly from a single question and is not a composite variable. In such circumstances it is appropriate to set the variance of its error term to a very small number. For the purpose of model testing in this thesis, the error term for MGTINOV was constrained to 0.001.

7.5 Testing the structural model

Following the assessment of the measurement models using CFA and development of the observed composite variables, the plausibility of the structural model is tested using SEM. As explained in Chapter 5, the model is run in the first instance using the Maximum Likelihood (ML) estimation technique since that is the default estimation technique routinely used in SEM. Note, however, that ML assumes that the data are multivariate normal.

⁸⁹ This is the process recommended by Hair *et al.* (1998) when a correlation matrix is used, as is the case for the analysis of the structural model (in contrast to the covariance matrices used for confirmatory factor analysis described in Chapter 6).

⁹⁰ The measure of reliability used is Cronbach's alpha.

Table 7-3 Latent variables remaining following scale evaluation

Scale	Model designation	First/second order variable	Number of indicators	Cronbach's alpha	Scale variance	Error variance constrained to:
<i>Psychological empowerment</i>	PE	second	3			
<i>Competence</i>	COMPETEN	first	3	0.838	0.555	0.090
<i>Impact</i>	IMPACT	first	3	0.776	0.408	0.091
<i>Self-determination</i>	SLFDET	first	3	0.756	1.080	0.263
<i>Transformational leadership</i>	TL	second	3			
<i>Charisma</i>	CHARISMA	first	4	0.825	0.941	0.165
<i>Inspiring subordinates</i>	INSPIRE	first	3	0.930	1.459	0.102
<i>Strategic vision and articulation</i>	VISION	first	3	0.914	1.407	0.120
<i>Value of strategic information</i>	INFORM	first	4	0.825	1.121	0.196
<i>Availability of resources</i>	RESOURCE	first	3	0.805	1.741	0.340
<i>Role clarity</i>	ROLCLAR	first	4	0.697	0.695	0.211
<i>Innovation in management structure</i>	MGTINOV	n/a	1	n/a	1.904	0.001

7.5.1 Maximum likelihood estimation

Figure 7-3a contains a representation of the model showing (unstandardised) parameter estimates for each of the paths. Figure 7-3b contains the standardised solution. Table 7-4 contains the fit indices produced from the model using ML and observation of this table reveals that the model fails to produce adequate fit indices, with χ^2 (37, $n = 539$) = 1,355, $p < 0.001$, $\chi^2/df = 36.636$, GFI = 0.659, AGFI = 0.493, NNFI (TLI) = 0.316, CFI = 0.437, RMSEA = 0.190 and CAIC = 887.973 (saturated CAIC = 400.934). None of these indices approaches the minimum acceptable cut-off levels, suggesting poor fit and that hypotheses cannot be tested. Due to the data demonstrating significant departures from normality, tests of model adequacy were assessed using weighted least squares (WLS), an estimation procedure that takes account of departures from normality⁹¹. The results of testing model fit using WLS are contained in the next section.

⁹¹ Due to consistent reporting of univariate non-normality, it can be assumed that the data distribution is not multivariate normal.

Table 7-4 Fit indices for the structural model (ML)

Index	χ^2	df	N	p	χ^2/df	GFI	AGFI	CFI	NNFI (TLI)	RMSEA	CAIC (saturated model)
Model score	1,355.532	37	539	<0.001	36.636	0.659	0.493	0.437	0.316	0.190	887.973 (400.934)

CAIC for the independence model is 2,460

Figure 7-3 Structural models (maximum likelihood)

Figure 7-3a Parameter estimates (unstandardised)

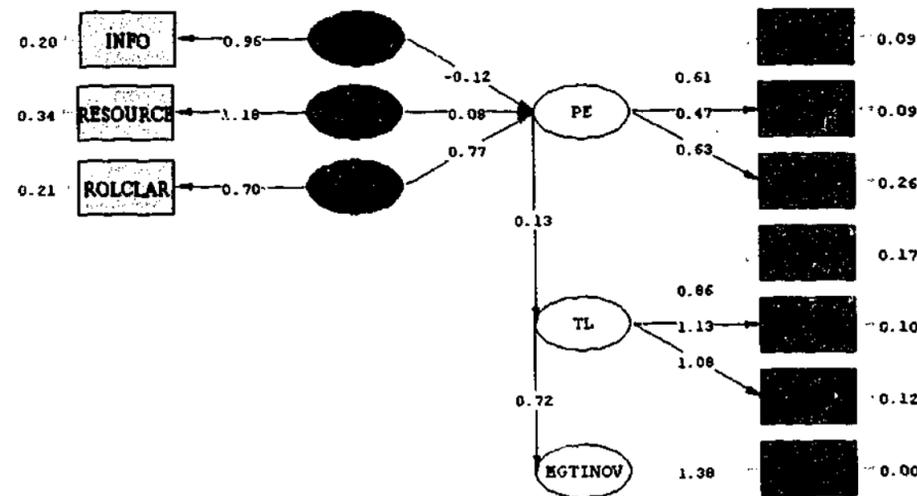
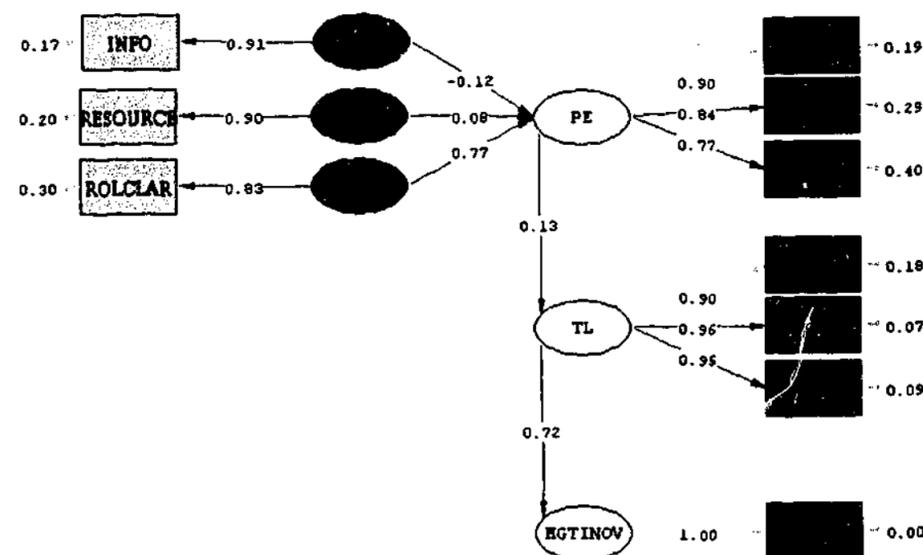


Figure 7-3b Standardised solution



7.5.2 Weighted least squares estimation

The model was tested again; this time using the weighted least squares (WLS) estimation method. Employment of this method is necessary due to the non-normality of the data. However, it requires a larger sample size than that required when using ML. Ideally, ML requires a sample size that exceeds a ratio of 20 subjects for each model parameter (Kline 1998). With 25 parameters in the model, the sample size of 539 exceeds this requirement (that is, 500 cases). WLS, on the other hand, requires a much larger sample size and this estimation method can only be trusted at the largest of sample sizes, where 'large' in this context is identified as in excess of 5,000 cases (Hu & Bentler 1995). Thus, care must be taken when interpreting the results when WLS is employed, since the minimum sample size required has not been achieved⁹². The inadequacy of the sample size amounts to a limitation of this thesis.

Figure 7-4a contains a representation of the model showing unstandardised parameter estimates, while Figure 7-4b shows the standardised solution produced using WLS. Table 7-5 contains the fit indices produced from the model using WLS and observation of this table reveals that the model produces fit indices that indicate a much higher level of adequacy compared with those produced using ML.

Table 7-5 Fit indices for the structural model (WLS)

Index	χ^2	df	N	p	χ^2/df	GFI	AGFI	CFI	NNFI (TLI)	RMSEA	CAIC (saturated model)
Model score	216.036	37	539	<0.001	5.839	0.902	0.855	0.974	0.968	0.095	347.251 (400.934)

CAIC for the independence model is 6,899

The absolute fit indices all exhibit marked improvements, with the χ^2 statistic improving from 1,355 to 216, the normed from 36.6 to 5.8⁹³. Absolute fit indices improve, with GFI improving from 0.659 to 0.902 and AGFI from 0.493 to 0.855. While these do not indicate good fit, the improvement is considerable. RMSEA improves from 0.190 to 0.095 and although it does not quite meet the criterion of <0.08, it is only marginally in excess of this requirement.

⁹² Refer to earlier discussion of model estimation and sample size in Section 5.2.5.

⁹³ Given the size of the sample (with $n > 200$), however, the χ^2 statistic may not hold much relevance.

Figure 7-4 Structural models (weighted least squares)

Figure 7-4a Parameter estimates (unstandardised)

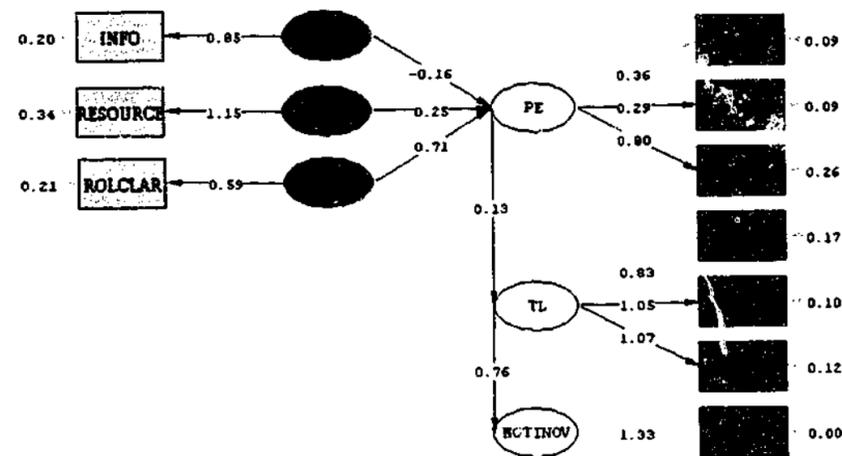
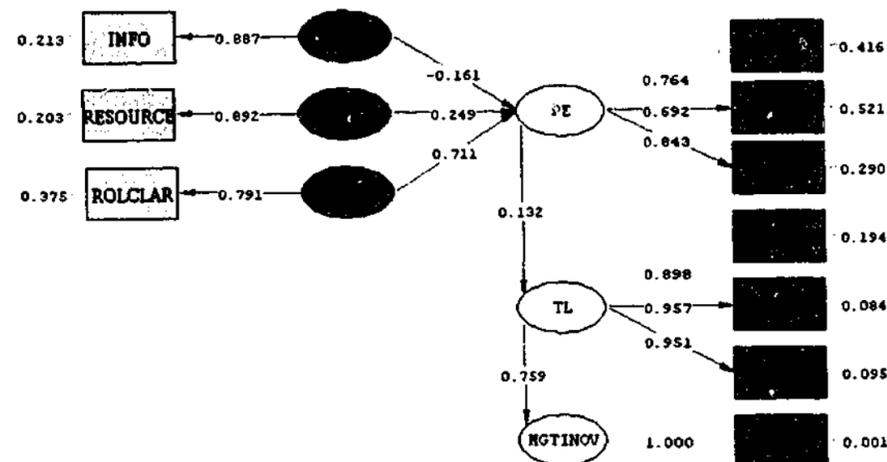


Figure 7-4b Standardised solution



Incremental fit indices show the most marked improvement, however, with the CFI improving from 0.437 to 0.974 and the NNFI (TLI) from 0.316 to 0.968. Both of these indices exceed the acceptable 0.95 criteria for incremental fit. Since there is evidence of multivariate non-normality, these two indices need to be investigated with a view to identifying how they perform under less than optimal conditions. Hu & Bentler (1995) presents a discussion of the ways in which these incremental fit indices perform in less than optimal circumstances (that is, small sample size, lack of independence between the latent variables and, most importantly for this thesis, non-normality). The discussion is based on results of comparisons of the performance of various estimators (including ML

and WLS) using the Monte Carlo method. Results suggest that under WLS, CFI and NNFI both reject models too frequently under conditions of non-normality, producing,

... values that are modestly underestimated (Byrne 2001, p. 268).

The improvements produced by the incremental indices in the test of model fit, therefore, are indicators of good fit.

Another piece of evidence for acceptable fit is an examination of the Akaike (1987) information criterion (AIC), which addresses the issue of parsimony and takes into account the number of parameters in the model⁹⁴. The consistent version of the AIC (the CAIC) developed by Bozdogan (1987), however, takes into account the sample size and, unlike the AIC, yields asymptotically consistent estimates (Byrne 2001). Because of this characteristic of the CAIC, it was felt to be more appropriate than the AIC for the purpose of this analysis. Examination of CAIC generated by the model using WLS yields a value of 347 (887 with ML), a value of 400 (same as for ML) for the saturated model and 6,899 for the independence model (2,460 with ML). This provides evidence of appropriate levels of model parsimony.

Overall, therefore, the model exhibits adequate fit. The nonnormality of the data distribution suggests that WLS is the more appropriate method of estimation. Nonetheless, a major limitation in the use of WLS is the lack of an adequate sample size given the significant nonnormality of the data and care needs to be taken in the interpretation of these results.

7.6 Hypothesis testing

Following the process of establishing model fit, attention focuses on the testing of the remaining hypotheses. These are reported in Table 7-6, which also contains statistics relevant to the hypothesis testing process. Observation of Table 7-6 reveals that all of the hypothesised paths produced acceptable levels of significance, although not all produced parameter estimates that were signed in the hypothesised direction. Each of these is considered in turn, to identify whether each of the hypotheses is supported or rejected.

⁹⁴ The AIC index is not revealed in Table 7-4 or 7-5. However, while the model AIC statistic generated using WLS (252) was lower than the independence AIC (6,845), it was greater than the AIC for the saturated model (110).

Following convention, hypotheses are supported if they are significant at the $p \leq 0.05$ significance level. The theoretical implications of the hypothesis testing process are considered in Chapter 8.

Table 7-6 Parameter estimates for the hypothesised relationships

Hypothesis	Parameter estimate (standardised)	SE	t-value (2-tailed)	Error variance	SE	t-value (2-tailed)	SMC for indicator
Antecedents to psychological empowerment (PE)							
Role clarity to PE H_{1-2}	0.711	0.128	***5.575	0.274	0.074	***3.688	0.731
Value of strategic information to PE H_{1-4}	-0.161	0.060	**2.684				
Availability of resources to PE H_{1-5}	0.249	0.089	**2.784				
PE to TL ⁹⁵ H_{2-2}	0.132	0.046	**2.879	0.977	0.100	***9.808	0.017
TL to Innovation in management structure H_3	0.759	0.038	***19.916	0.424	0.026	***16.383	0.577

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

7.6.1 Role clarity to psychological empowerment

Hypothesis 1-2: Perceptions of role clarity of state school principals is positively related to their psychological empowerment

It was hypothesised that the parameter estimate of the effect of *role clarity* on *psychological empowerment* would be statistically significant and positive. That is, the more clearly principals perceive their roles, the higher the levels of *psychological empowerment* they will experience. Support was found for the measurement of role clarity following confirmatory factor analysis using four indicators (described in Chapter 6).

Observation of Table 7-6 reveals a parameter estimate of 0.711, a standard error of 0.128, a *t*-value of 5.575 (significant at the $p < 0.01$ level). Along with other three antecedent variables, it produced an SMC of 0.731. This is evidence of a very strong relationship for the combined influence of the three antecedent variables. The parameter estimate is positively signed and the *t*-value indicates that the relationship is better than the determined level of acceptability. Thus, data analysis in this thesis provides produces a

⁹⁵ TL: Transformational leadership

significant, positive relationship between *role clarity* and *psychological empowerment* and *Hypothesis 1-2* is supported.

This result is consistent with the findings of Spreitzer (1996), who found that if people do not know the extent of their authority they will hesitate to act, feel unable to make a difference, have low self-confidence and be fearful of potential repercussions for decisions made under ambiguous authority. Hypothesis testing in this thesis supports this view and suggests that principals with a clear idea of their role will have stronger feelings of empowerment than those whose perceptions of their role are more ambiguous.

Since the introduction of *Schools of the Future*, the role of principals has changed in terms of the level of control they have over the management of their schools. As outlined in Chapter 2, the role of the principal has changed. They now enjoy more autonomy and control over many aspects of management, including staff selection, control over administrative structure, student recruitment and availability of (mostly financial) resources. The results of hypothesis testing suggest that, in order to feel more empowered, principals need to gain a clear idea of their role under this new structure. This can be obtained through education and training aimed at providing both principals and aspirants with a full understanding of the role of principal and the techniques and strategies required to fulfill the role adequately.

7.6.2 Value of strategic information to psychological empowerment

Hypothesis 1-4: The state school principal's perception of the value of the strategic information is positively related to their psychological empowerment.

It was hypothesised that the parameter estimate of the effect of *value of strategic information* on *psychological empowerment* would be statistically significant and positive. That is, the higher the perception of the importance of the *School Charter* process, the higher the level of *psychological empowerment* experienced by the school principal. Observation of Table 7-6 reveals a parameter estimate of -0.161, a standard error of 0.060, a *t*-value of -2.684 (significant at the $p < 0.05$ level) and, along with the other two antecedent variables, produced an SMC of 0.731. Although the relationship is significant at the $p \leq 0.05$ significance level (the predetermined level of acceptability), the estimate is negatively signed so there is no support for the hypothesis. It must be rejected. Nonetheless, the result is surprising and requires further discussion.

Policy-makers designed both the *School Charter* and the *Triennial Review* processes as integral parts of an accountability framework. This accountability,

... forms part of administrative decentralisation⁹⁶, with authorities and responsibilities imposed upon principals constrained by the minister (Caldwell & Spinks 1998, p. 72).

Although designed as accountability measures, these processes provide principals with strategic information relating to their school's mission (contained in the *School Charter*), as well as information relating to performance with respect to that mission (contained in the *Triennial Review*). Thus, apart from accountability, other benefits are expected to arise from the generation of this information. They include, among other things, more creativity (Kouzes & Posner 1987), taking initiative (Kanter 1983) and, as identified in *Hypothesis 1-4*, increased *psychological empowerment* (Spreitzer 1995a). Thus, data analysis in this thesis produced a statistically significant, negative relationship between *value of strategic information* and *psychological empowerment* and *Hypothesis 1-4* cannot be supported.

A possible explanation for this negative relationship is that school principals perceive the processes involved in collecting and processing this information, especially in view of its mandatory nature, as an administrative imposition. It is possible that these administrative requirements are perceived, to some degree, as interfering with principals' role as independent ('empowered') managers and preventing them from 'getting on with the job'. This perception appears to outweigh the perception of usefulness of the information that is generated.

Care needs to be taken in interpreting this result, however. *Hypothesis 1-4* links *value of strategic information* with *psychological empowerment*. No direct link is hypothesised between *value of strategic information* and other desirable outcomes such as improvements in management efficiency or other management outcomes. Nonetheless, the result could provide some indication that the accountability processes are viewed as obstacles to the managerial role of principals, administrative requirements that encumber them. A discussion of the implications of this result is contained in Section 8.6.

⁹⁶ From an individual-level perspective this can be viewed as *situational empowerment*, defined in Chapter 1 and discussed in Section 3.2.

7.6.3 Availability of resources to psychological empowerment

Hypothesis 1-5: State school principals' perceptions of the availability of adequate resources are positively related to their psychological empowerment.

It was hypothesised that the parameter estimate of the effect of *availability of resources* on *psychological empowerment* would be statistically significant and positively signed. That is, the higher the perception of *availability of resources* adequate for the running of the school, the higher the level of *psychological empowerment* experienced by the school principal.

Examination of Table 7-6 reveals a parameter estimate of 0.249, a standard error of 0.089, a *t*-value of 2.784 (significant at the $p < 0.05$ level) and, along with other antecedent variables, produced an *SMC* of 0.731. The parameter estimate is positively signed and the *t*-value reflects that the relationship is significant at better than the determined level of acceptability. This suggests that there is strong support for the hypothesis.

Thus, data analysis provides support for this hypothesis, statistical analysis producing a positive and significant relationship. This result is in contrast to the findings of Spreitzer (1996), who found no support for her hypothesis that 'access to resources' was positively related to *psychological empowerment*. Spreitzer attributed this lack of support to her failure to identify the type of resources clearly enough and to interactions identified between 'access to resources' and other antecedents, notably 'sociopolitical support' and 'access to information'. The support generated for the hypothesis in this thesis suggests that the explanations offered by Spreitzer do not necessarily account for its failure in her study. A more likely explanation is to be found in respect of differences in the populations from which each study was drawn. School principals have a clearer idea of what resources are available to them and a common understanding of how such resources are obtained. In contrast, Spreitzer's sample of 393 middle managers was drawn from population of 'diverse units of a Fortune 50 organisation'. It is possible that such diversity could have meant that there was no common understanding of the range of resources available and the ease of access to those resources.

The finding in this thesis supports the view that the level of *psychological empowerment* experienced by state school principals depends, to some degree, on their perceptions of the adequacy of resources available to them. The *Global Budget* for Victorian State schools is linked with their total student enrolments and the level of resources allocated to a school

determines the breadth and depth of its curriculum offering. Higher enrolment numbers (and consequent higher levels of funding) introduce economies of scale that allow principals to offer a breadth of curriculum not available to schools with lower enrolment levels. Further, availability of adequate resources allows a principal to develop and introduce new curriculum and provide appropriate learning opportunities for the community it serves. For policy-makers it appears that providing state schools with adequate levels of resources has a positive effect upon the feelings of empowerment of principals in addition to other, more educationally oriented, benefits.

7.6.4 Psychological empowerment to transformational leadership

Hypothesis 2-2: The psychological empowerment of state school principals is positively related to their level of transformational leadership.

Psychological empowerment is the increased intrinsic task motivation manifested in cognitions that reflect an individual's active orientation to his or her work role. *Hypothesis 2-2* suggests that the *psychological empowerment* of school principals affects their levels of *transformational leadership*.

It was hypothesised that the parameter estimate of the effect of *psychological empowerment* on *transformational leadership* would be statistically significant and positively signed. That is, the higher the perception of principals' *psychological empowerment*, the higher the level of *transformational leadership* as perceived by subordinates. Examination of Table 7-6 reveals a parameter estimate of 0.132, a standard error of 0.045, a *t*-value of 2.879 (significant at the $p < 0.05$ level). The parameter estimate is positively signed and the *t*-value indicates that there is support at the $p < 0.05$ level of significance. This hypothesis is therefore supported, although the low reported *SMC* indicates that *psychological empowerment* accounts for only 1.7% of the variance in *transformational leadership*. Thus, data analysis in this thesis supports this hypothesis, although clearly there are other antecedents to *transformational leadership* not included in the model that have a far greater impact on *transformational leadership* than *psychological empowerment*.

There has been little research into the consequences of employee empowerment to date and almost no research has focused on interpersonal outcomes for managers and the effects on leadership. An earlier study addressed that gap (Spreitzer *et al.* 1999). That study examined the relationship between *psychological empowerment* and change-oriented leadership, and investigated the relationship between *psychological empowerment* and

various leadership characteristics (for example, 'innovativeness', 'upward influence', 'inspiration' and 'monitoring'). Only two of those dimensions, 'innovation' and 'inspiration' are relevant to this thesis, each of which requires further consideration and explanation.

In the Spreitzer *et al.*, (1999) study, 'innovation' was included as a direct outcome of *psychological empowerment*. This is not the case in this thesis where *transformational leadership* is modelled as a variable intervening in the relationship between *psychological empowerment* and *innovation in management structure*. Although the earlier study found support for a positive relationship between *psychological empowerment* and 'innovation' (Spreitzer *et al.* 1999), that relationship is not tested in this thesis. Strong support was found, however, for the relationship between *transformational leadership* and *innovation in management structure* (discussed in Section 7.6.5).

Examination of the leadership characteristic 'inspiration', as used in Spreitzer's (1999) study, reveals that it contains elements of leadership similar to many of the dimensions of *transformational leadership* used in this thesis. For example, measurement items for 'inspiration' included 'capacity to excite people with a vision of what might be accomplished if they work together'. This has resonance with the dimension *strategic vision and articulation*. Similarly, 'impact on people's optimism for the future' has equivalence with the dimension *charisma*. Thus, 'inspiration' in Spreitzer *et al.*'s (1999) study is not defined as narrowly as *inspiring subordinates* is, in the conceptualisation of *transformational leadership* in this thesis. Thus, in the earlier study, 'inspiration' has a degree of correspondence with the overarching variable of *transformational leadership* as used in this thesis.

The level of support for the relationship between *psychological empowerment* and 'inspiration' in Spreitzer *et al.*'s (1999) study, though significant and positive, was found to be weak. In addition, links with another characteristic of leadership, 'upward influence' also produced only a weak positive relationship. The result produced from data analysis in this thesis is similar to these earlier findings and it would appear that, while there may be benefits arising out of a principal's *psychological empowerment*, the effects upon *transformational leadership* are not as strong as has been considered.

7.6.5 Transformational leadership to innovation

Hypothesis 3: The level of transformational leadership of state school principals is positively related to the level of innovation in management structure.

Transformational leadership is the ability of principals to stimulate interest among colleagues and followers to view their work from new perspectives, to generate awareness of the mission or vision of the team and organisation, to develop colleagues and followers to higher levels of ability and potential, and to motivate colleagues and followers to look beyond their own interests toward those that will benefit the group. The measure for *transformational leadership* reflects the perceptions of a principal's immediate subordinate, their assistant principal. *Innovation in management structure* reflects the assistant principal's perceptions of the extent to which innovation has occurred in the management structure of the school. *Hypothesis 3* suggests that a principal's *transformational leadership* affects the level of *innovation in management structure* experienced within their school and that the parameter estimate of the effect of *transformational leadership* on *innovation in management structure* would be statistically significant and positively signed. That is, the higher the levels of transformational leadership demonstrated by the principal, the higher the level of innovation in management structure attributed to the principal. Examination of Table 7-6 reveals a parameter estimate of 0.759, a standard error of 0.038, a *t*-value of 19.916 (significant at the $p < 0.01$ level) and an *SMC* of 0.577. The parameter estimate is positively signed and the *t*-value indicates that the relationship is significant at better than the determined level of acceptability. Data analysis in this thesis indicates strong support for this relationship.

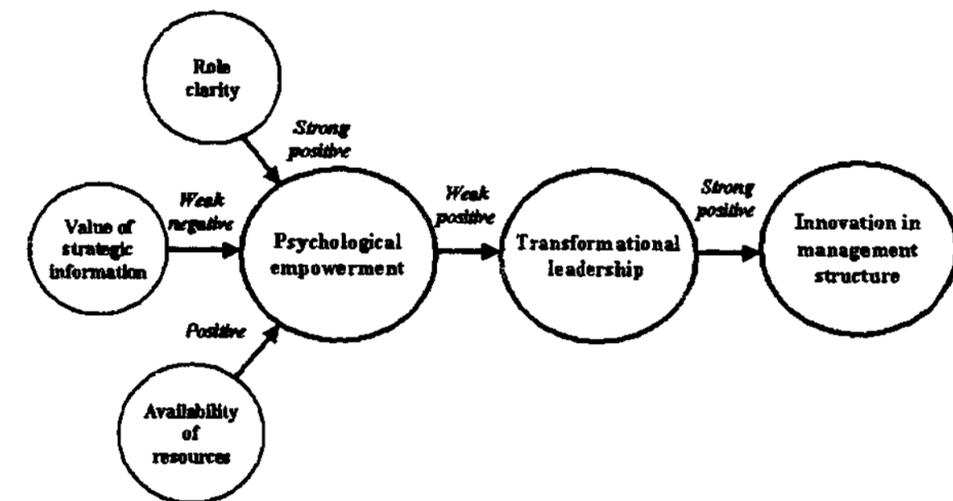
Prior research has produced evidence of strong support for a direct, positive, relationship between *psychological empowerment* and 'innovation' (Spreitzer *et al.* 1999). Modelling *transformational leadership* as a variable intervening the relationship between *psychological empowerment* and *innovation in management structure* in this thesis represents a contribution to theory development, suggesting that empowerment may not affect innovation directly. While data analysis testing the effect of *psychological empowerment* and *transformational leadership* produced only a weak relationship, the

relationship between *transformational leadership* and innovation was strong, suggesting that *psychological empowerment* affects innovation only minimally⁹⁷.

7.7 Chapter summary

This chapter contains a discussion of the results of the testing of the hypothesised model for *psychological empowerment* (with three antecedents) and *transformational leadership* leading to *innovation in management structure*. The model achieved acceptable levels of fit and support was found for all but one of the hypotheses. Figure 7-5 contains a diagrammatic representation of the final model and Table 7-7 contains a summary of the results of hypothesis testing.

Figure 7-5 Results of final tested model



Specifically, support was found for the hypotheses linking the availability of resources (significant at the $p < 0.01$ level) and role clarity (significant at the $p < 0.001$ level) to principals' psychological empowerment. Estimated parameters were signed in the

⁹⁷ An examination of the possibilities of competing models (for example, a direct link between *psychological empowerment* and *innovation in management structure*) was not considered in this thesis, since this procedure would amount to a shift to exploratory mode. The purpose of this thesis is to test (confirm) an hypothesised model.

hypothesised (positive) direction. However, no support was found for the hypothesised positive association between strategic information and principals' psychological empowerment. Although the estimated parameter was significant (at the $p < 0.01$ level), the direction of the sign of the relation was negative.

Support was also found for the hypothesis linking the psychological empowerment of principals with their level of transformational leadership (significant at the $p < 0.001$ level), as perceived by their assistant principals. Finally, support was found for the hypothesis linking the principal's transformational leadership with innovation in the management structure within the school (significant at the $p < 0.001$ level), as perceived by assistant principals.

Some hypotheses were unable to be tested due to an inability to provide adequate measurement of the independent variable. They are as follows.

- Hypothesis 1-1 *Internal locus of control* is positively related to *psychological empowerment* for state school principals.
- Hypothesis 1-3 The *self-esteem* of state school principals is positively related to their *psychological empowerment*.
- Hypothesis 2-1 The *high risk profile* of state school principals is positively related to their level of *transformational leadership*.
- Hypothesis 2-3 The *need for achievement* of state school principals is positively related to their level of *transformational leadership*.

The first two of these hypotheses relate to the influence of two individual-level variables on principals' *psychological empowerment*. Failure to provide support for these hypotheses does not affect the overall model critically since individual-level characteristics of individuals (including principals) are uncontrollable and there are no implications for policy development. The second two hypotheses were included in the model in order to reduce the influence of specification error. This is the error made when critical variables are omitted from a model. Again, failure to provide support for these hypotheses does not affect the overall model critically. The inability to measure the independent variables adequately does not amount to a rejection of these hypotheses, although they cannot be supported in this thesis.

Table 7-7 Results of hypotheses testing

Hypotheses		Accept hypothesis
Antecedents to psychological empowerment		
H ₁₋₂	The perception of <i>role clarity</i> of state school principals is positively related to their <i>psychological empowerment</i> .	Yes
H ₁₋₄	The perception of importance of <i>value of strategic information</i> is positively related to the <i>psychological empowerment</i> of state school principals.	No ⁹⁸
H ₁₋₅	The perception of <i>availability of resources</i> of state school principals is positively related to their <i>psychological empowerment</i> .	Yes
Psychological empowerment to transformational leadership		
H ₂₋₂	The <i>psychological empowerment</i> of state school principals is positively related to their level of <i>transformational leadership</i> .	Yes
Transformational leadership to innovation in management structure		
H ₃	The level of <i>transformational leadership</i> of state school principals is positively related to the level of <i>Innovation in management structure</i> experienced within a school.	Yes

While some of these results appear surprising, others provided the levels of support anticipated. The following chapter, Chapter 8, contains a discussion of these findings and their implications for theory development and management practice.

⁹⁸ The hypothesis is rejected since, instead of the anticipated positive relationship, the results indicate a relationship in the opposite (negative) direction.

Chapter 8

Research discussion and conclusions

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Chapter 8

Research discussion and conclusions

8.1 Introduction

The purpose of this chapter is to present a discussion of the findings reported in the previous two chapters as well as a discussion of the implications of these findings for theory and policy development. It commences with a review of relevant gaps in both literature and policy in Section 8.2. This is followed by a review of the findings (research question, model development and results of hypothesis testing) in Section 8.3. Section 8.4 contains the research conclusions, Section 8.5 contains the research contributions and Section 8.6 contains a description of the implications and recommendations of the research in terms of theory and policy development. Research limitations are presented in Section 8.7, while a consideration of possible directions for future research is presented in Section 8.8. This chapter concludes with a summary of the thesis in Section 8.9.

8.2 Gaps in the literature

This section contains a re-statement of gaps in theory identified in the literature, providing the motivation for the thesis. It commences with a discussion of the gaps in theory and is followed by a discussion of gaps in policy development.

8.2.1 Gaps in theory

Whereas there is much anecdotal evidence to support the importance of empowerment in effective management, there is little empirical evidence to support this contention. Researchers have suggested that more attention should be paid to the characteristics of empowerment and the underlying processes (Keller & Dansereau 1995, Spreitzer *et al.* 1999). In particular, there have been calls for studies that relate leadership practices to empowerment (Conger & Kanungo 1988), with acknowledgement that there is a paucity of research into the leader's role in the empowerment process (Konczak *et al.* 2000).

Within the empowerment and leadership literature there is an identified need to undertake research within particular environmental settings. First, there is a need to identify support for both *psychological empowerment* and *transformational leadership* as multi-dimensional variables. Second, there is a need to identify the role that both these variables

play in the effective management of organisations. In order to address these needs it has been suggested that, for *psychological empowerment*, future research needs to consider both environmental influences and organisational factors (Zimmerman 1990). For *transformational leadership*, evidence from its re-examination (Avolio *et al.* 1999), re-evaluation (Weber 1947) and criticism indicate the need to locate the research within a clearly defined context (Yukl 1999). These suggestions are reflected in the research design of this thesis, locating the study within the State Government of Victoria *Department of Education, Employment and Training*, focusing on the perceptions of school principals and their assistants.

8.2.2 Gaps in policy

A recent phenomenon in the governance of public sector organisations has been the implementation of initiatives designed to increase their levels of efficiency and effectiveness. Many of these initiatives represent adaptations from the private sector, introducing levels of competitiveness not previously experienced in the public sector. Examples of such programs include the introduction of compulsory competitive tendering for local governments, adoption of purchaser/provider models for health organisations and the outsourcing of non-core activities in many public sector organisations. In all cases these initiatives have been accompanied by increases in accountability for the organisations involved. The research question focuses the investigation on the effects of the devolution of decision-making and increased accountability on state school principals' feelings of empowerment.

There is no empirical evidence to support the contention that school principals in receipt of such decision-making power will feel empowered under these conditions, or that such principals will act to improve processes and implement strategies as a result of these school-based management changes. Indeed, it has been argued that management practices are only one set of conditions determining feelings of empowerment and that such practices may empower employees but will not necessarily do so (Conger & Kanungo 1988).

Within the school-based management environment it is of interest to identify principals' *psychological empowerment* as measured by the four-dimensional variable definition presented in Spreitzer (1995a). It is also of interest to identify factors that influence this feeling of empowerment and the outcomes that can be expected from empowered principals. In addition, given the little that is known about the outcomes of *psychological*

empowerment in terms of *transformational leadership*, innovation and managerial effectiveness, empirical evidence is needed to support the premise that *psychological empowerment* will produce innovative and effective outcomes in school principals. Substantiation of these propositions adds support to the idea that devolutionary initiatives will influence learning outcomes, albeit only as the first stage of an indirect pathway through the various systems that operate within schools.

From a policy development perspective there is a paucity of empirical research into the public sector environment following the implementation of change initiatives. This especially applies to initiatives that seek to give public managers greater authority and responsibility, while holding them accountable for their performance. In respect to the research context in this thesis (the Victorian State *Department of Education, Employment and Training*), questions remain as to the outcomes achieved by the school-based management initiative (the *Schools of the Future* program).

8.3 Review of the findings

This section contains a re-statement of the research question, a summary of the development of the model and the results of hypothesis testing. The discussion centres on the way this thesis addresses the gaps in the literature.

8.3.1 The research question

The research question represents a direct response to the gaps in the literature (identified above). It is re-stated here as follows.

Do psychological empowerment and transformational leadership play a significant role in the governance of state schools following decentralisation?

An empirical investigation into the psychological empowerment of school principals in receipt of administratively transferred ('situational'⁹⁹) empowerment is a first step towards understanding the effects of this initiative within schools. Decentralisation at the administrative level involves the formal transfer of decision-making power to operational managers. This is referred to as 'situational empowerment'. *Psychological empowerment*,

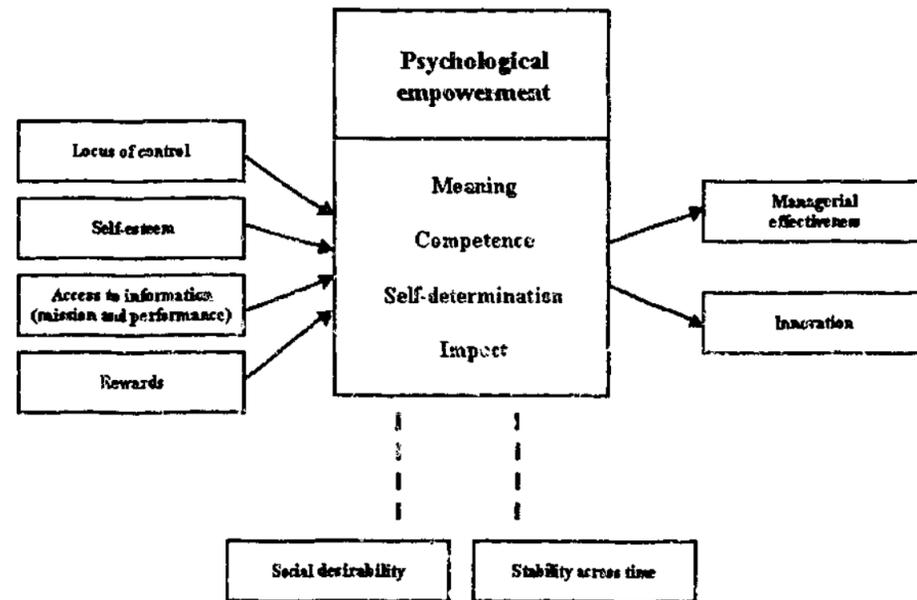
⁹⁹ Refer to Section 3.2 for a discussion of both 'situational' empowerment (empowerment that arises from administrative decree) and 'psychological' empowerment (the level of empowerment 'felt' by an individual).

on the other hand, refers to the feelings of empowerment experienced by the managers in receipt of this increased decision-making power. The research question addresses the issue of whether this 'felt' empowerment makes a significant impact upon desirable management outcomes such as *transformational leadership* and innovation. In order to address this question, a model comprising relevant variables was devised that summarises key variables and their interrelationships. This model is described in the following subsection.

8.3.2 Model development

The model for data analysis was developed from the partial nomological network of *psychological empowerment* in the workplace (Spreitzer 1995a), as presented in Figure 8-1. This network identifies key variables that relate to *psychological empowerment* and describes their interrelationships. A contribution of this thesis is the development of a model from this nomological network that is adapted to the environment experienced by Victorian state school principals. These are managers in receipt of increased decision-making power and increased accountability requirements following decentralisation. The hypothesised model is contained in Figure 8-2.

Figure 8-1 Nomological network of workplace *psychological empowerment*



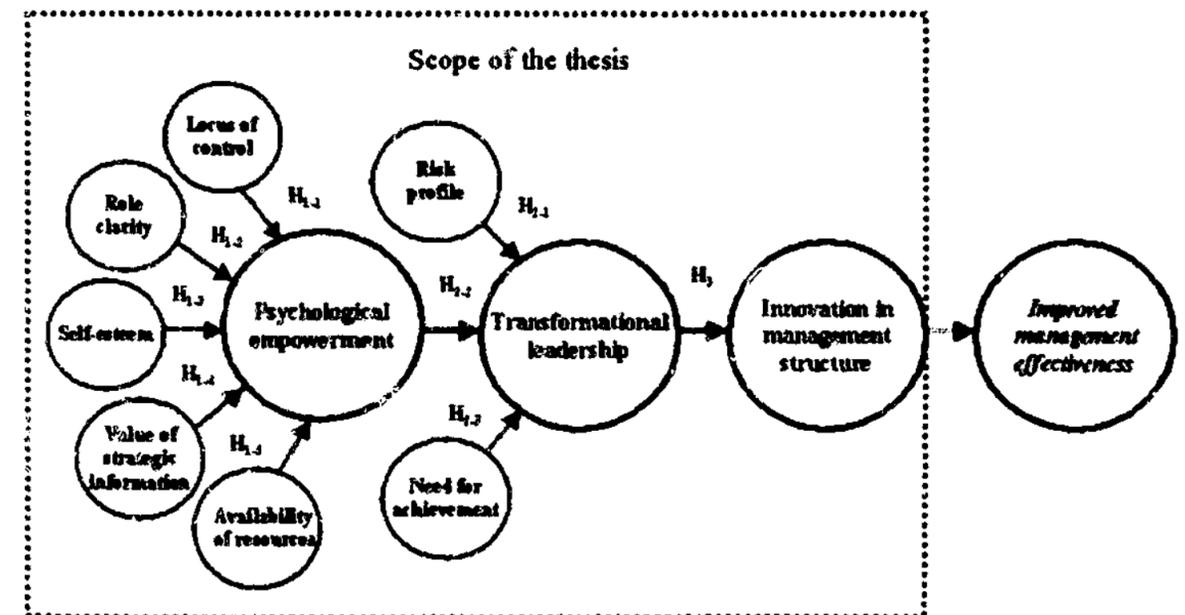
(Spreitzer 1995a)

The model was revised to include *transformational leadership* as an intervening variable in the association between *psychological empowerment* and innovation. To minimise specification error (the error that arises from omitting key variables) two further variables, *need for achievement* and *risk profile*, were included as antecedents to *transformational leadership*.

The first stage of data analysis involved the testing of measurement models designed to measure latent variables for each of the variables. Results of this analysis indicated support for the conceptualisation of *psychological empowerment* and *transformational leadership* as multi-dimensional (second-order) variables, and three variables hypothesised to influence *psychological empowerment* as first-order latent variables. Variables for which there was no evidence of structural validity were excluded from further analysis.

The second stage involved testing the structural model (comprising variables surviving confirmatory factor analysis and their hypothesised relationships) for fit with the data. Testing this structural model produced acceptable levels of fit, providing a strong confirmatory test to the causal relationships comprising that model. Hypotheses were tested with reference to the significance tests for the structural model parameters.

Figure 8-2 Hypothesised model



8.3.3 Results of hypothesis testing

Table 8-1 Summary of hypotheses

Hypotheses describing links in the model		Hypothesis supported?	Comment
Antecedents to psychological empowerment			
H ₁₋₁	The <i>internal locus of control</i> of state school principals is positively related to their <i>psychological empowerment</i> .	No	Unable to test the hypothesis due to the scale inadequacy of <i>internal locus of control</i> .
H ₁₋₂	Perceptions of <i>role clarity</i> of state school principals are positively related to their <i>psychological empowerment</i> .	Yes	Strong support for hypothesis.
H ₁₋₃	The <i>self-esteem</i> of state school principals is positively related to their <i>psychological empowerment</i> .	No	Unable to test the hypothesis due to the scale inadequacy of <i>self-esteem</i> .
H ₁₋₄	The perception of the <i>value of strategic information</i> is positively related to the <i>psychological empowerment</i> of state school principals.	No	Significant relationship identified, though not in the hypothesised direction.
H ₁₋₅	The perception of <i>availability of resources</i> of state school principals is positively related to their <i>psychological empowerment</i> .	Yes	Strong support for the hypothesis.
Antecedents to transformational Leadership			
H ₂₋₁	The <i>risk profile</i> of state school principals is positively related to their level of <i>transformational leadership</i> .	No	Unable to test the hypothesis due to the scale inadequacy of <i>risk profile</i> .
H ₂₋₂	The <i>psychological empowerment</i> of state school principals is positively related to their level of <i>transformational leadership</i> .	Yes	Significant, though not strong, support for the hypothesis.
H ₂₋₃	The <i>need for achievement</i> of state school principals is positively related to their level of <i>transformational leadership</i> .	No	Unable to test the hypothesis due to the scale inadequacy for <i>need for achievement</i> .
Antecedent to innovation in management structure			
H ₃	The level of <i>transformational leadership</i> of state school principals is positively related to the level of <i>innovation in management structure</i> experienced in a school.	Yes	Strong support for the hypothesis.

Table 8-1 contains a summary of the testing of hypotheses incorporated into the model. Hypotheses that produced statistically significant relationships are displayed in that table as shaded. Figure 8-3 contains the final tested model and arrows indicate the direction of each of the relationships. An indication of the strength of the relationships is also included. Observation of that figure reveals *role clarity* and *availability of resources* as influencing *psychological empowerment* in a positive direction and *value of strategic information* as having a weak negative influence on *psychological empowerment*¹⁰⁰. It also reveals that *psychological empowerment* exerts a positive, though weak, influence on

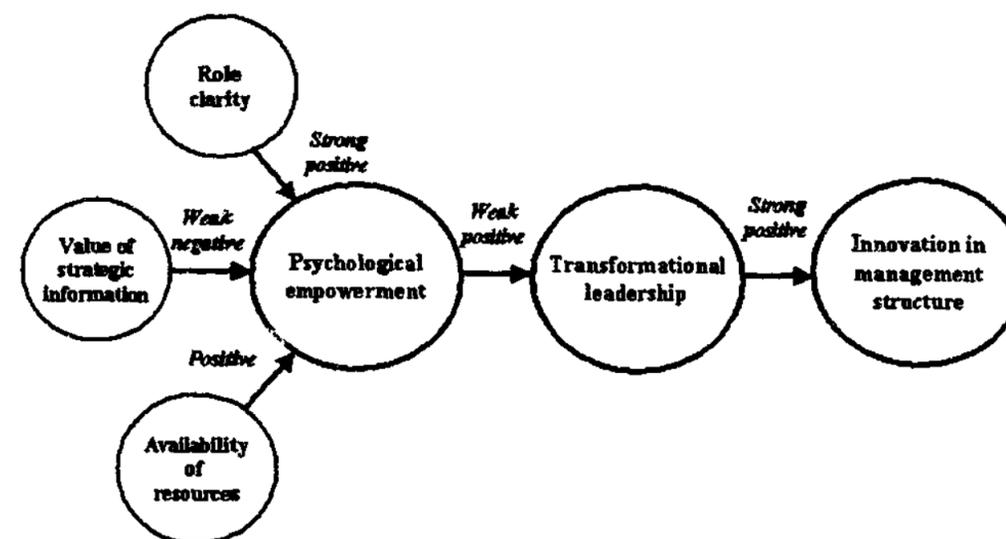
¹⁰⁰ This surprising result is discussed in detail in Sections 8.4.2 and 8.6.2.

transformational leadership, and there is evidence that *transformational leadership* exerts a strong positive influence on *innovation in management structure*.

8.4 Research conclusions

Following data analysis and hypothesis testing, certain conclusions have been reached with respect to the research population (principals of large Victorian State schools). Overall, there is support for the contention that *psychological empowerment* and *transformational leadership* play a part in the governance of large state-owned schools operating under a system of decentralisation. Care is needed in the interpretation of these conclusions, however, since the research was limited to this population.

Figure 8-3 Results of final tested model



8.4.1 Multidimensional variables

The first set of conclusions relates to the conceptualisation of both *psychological empowerment* and *transformational leadership* as multi-dimensional variables. Following empirical testing, support was found within this environment for hypothesised relationships, although with some modification. *Psychological empowerment* was found to

comprise three dimensions. They are *competence, impact and self-determination*¹⁰¹. *Transformational leadership* was also found to comprise three dimensions. They are *charisma, inspiring subordinates and strategic vision*¹⁰².

8.4.2 Model validity

The second set of conclusions relates to the variables comprising the structural model and their interrelationships. First, attention is given to variables influencing *psychological empowerment*. This is followed by a discussion of its influence on *transformational leadership* leading to *innovation in management structure*.

Variables influencing *psychological empowerment*

As predicted, two determinants were found to exhibit a direct, positive influence on *psychological empowerment*; they are *role clarity* and *availability of resources*. Thus, it is apparent that principals' feelings of empowerment increase as a result of their perceptions of the adequacy of available resources and a clear understanding of their role within this newly decentralised system.

A surprising result of data analysis, however, is the (small) negative influence of the value of strategic information on feelings of empowerment where a positive relationship was anticipated. Care is needed when interpreting this result, since it cannot be concluded that principals who value strategic information will demonstrate low feelings of empowerment. Such a conclusion is counter-intuitive and incongruous. A more appropriate conclusion of this finding is that other variables are influencing this relationship and that further analysis is required. A discussion on this issue follows.

In her original network, Spreitzer (1995a) predicted that workers with access to strategic information about their organisation influenced their feelings of *psychological empowerment*. Specifically, that information related to two types of strategic information, information about the mission of the organisation and information about the extent to which the mission was achieved. That conceptualisation was changed in this thesis since the Victorian State school principals all have access to the types of strategic information to

¹⁰¹ The *meaning* dimension was eliminated due to an inability to produce adequate measurement for the concept, not because of its inappropriateness.

¹⁰² *Intellectual stimulation* was excluded because it demonstrated problems of multicollinearity, making it unsuitable for data analysis.

which Spreitzer refers, created through the operation of compulsory accountability processes. One limb of the process is the development of a *School Charter* (a school's mission); the other limb involves a three-year evaluation undertaken via the *Triennial Review*¹⁰³. Since principals all have access to strategic information about their schools, it was necessary to change the emphasis of the variable in this thesis. Instead of asking whether principals had access to strategic information (they all do), they were asked about the value they placed on this information. In this way it was thought possible to tap into the perceptions of usefulness of the strategic information to which they have access and to evaluate, empirically, the influence this exerts upon *psychological empowerment*.

In order to gain an explanation for this (modest) negative relationship, following data analysis, an interview was conducted with a consultant to the University of Melbourne who was engaged to undertake independent reviews of schools as part of their *Triennial Review* process. This consultant has seven years' experience in this role, having reviewed a total of 45 schools. In addition, the consultant served as principal of a large metropolitan Victorian State secondary school for thirteen years. Asked for comments on the results of the testing of this relationship, he suggested that many principals are of the opinion that the accountability process imposed by government is,

... something to be ignored or worked around and certainly not to be taken seriously, 'because, I know what I am doing and nobody else needs to or should (have the right to) know'.

This consultant described the attitude as, '... a sort of olde world view of autonomy or, if you like, a rejection of accountability'. He identified various 'types' of principals, described as follows. First, there are the principals who know what they are doing and are confident about what they do. Second, there are those who '... think they know what they are doing but aren't sure'. Finally there are those who '... know that they don't know what they are doing but know they can't admit to it short of a nervous breakdown'. The first type, he says, are 'not especially interested in feedback', because they feel confident that the news will be good. The second type suspect that there are problems and therefore do not want feedback in case the news is bad. The third type try to keep the lid on an unmanageable situation and feedback '... could be the last straw - they are running

¹⁰³ A detailed discussion on the operation of these procedures is contained in Section 2.6.

scared'. Finally, the consultant's opinion on *School Charter* statements is that they tend to be '... 'motherhood', or rather 'parenthood' statements which any school would have, [for example], 'all students should achieve their full potential'.'

An interview conducted with the assistant principal of a large regional secondary school, responsible for the production of the school's *Triennial Review*, suggested that the *Triennial Review* does not provide principals (and the management team) with information of which they are unaware. While the information it produces is valued, it only confirms what is already known about their school's performance, merely substantiating their intuitive understandings quantitatively. This assistant principal suggested that the information is useful only to the extent that it satisfies accountability requirements of the *Department of Education, Employment and Training*.

A further interview, carried out with the principal of a large regional secondary school, revealed that he was engaged in the development of a strategic plan separate from that of the *School Charter/Triennial Review* process. This principal had completed a postgraduate course in leadership. He postulated one reason for the charter process being seen as not useful as a strategic planning document. That is, staff members generally see the charter process as a bureaucratic impost, they have little identification or ownership of the process and therefore will not actively and enthusiastically pursue the charter's priorities. The view of this principal was that the *School Charter/Triennial Review* process did not provide information upon which effective strategies could be developed and that a separate system was required that targeted these needs directly. Indeed, he explained that he is currently involved in the development of such a system in his school.

These insights indicate that there are many possible explanations for the negative relationship between *value of strategic information* and *psychological empowerment*. Overall, there appears to be a perception by principals that the *School Charter/Triennial Review* process has accountability as its primary purpose. While it may provide principals with useful information, on balance, principals may view the process as one of accountability and one that interferes with their feelings of empowerment. Given the relative weakness of the relation between the two variables in the model, the *School Charter/Triennial Review* processes may be regarded as only a minor influence on reducing feelings of empowerment.

From a theory development perspective, no clear recommendations relating to this relationship are possible since the emphasis on 'access' to strategic information was changed. All principals have 'access' to strategic information relating to their schools, and it has been found that the value placed on this information does not increase their sense of empowerment; rather, it was found to exert a small negative influence. There is no indication that providing principals with valued strategic information increases their sense of empowerment.

Variables influencing *transformational leadership*

It appears that a principal's level of *transformational leadership* (as perceived by their assistant principal) is only weakly affected by their feelings of empowerment. This finding suggests that principals who feel empowered are more likely to demonstrate qualities associated with a transformational leader than those whose feelings of empowerment are not as high. This relationship was not found to be as strong as was anticipated, indicating that *psychological empowerment* is not a persuasive predictor of *transformational leadership*. This result is consistent with the finding of a similar prior study, undertaken within a different research context (Spreitzer *et al.* 1999) and it indicates that variables other than *psychological empowerment* determine the extent of a principal's *transformational leadership*.

This finding raises questions relating to what reasons explain this unexpected finding and what variables might influence *transformational leadership*. It may be, for example, that a significant proportion of principals surveyed gained their position under the superseded system of seniority, rather than on merit. The orientation of such principals may be more closely aligned with notions of stewardship, rather than with transformation. If that is the case, a similar survey undertaken at a later stage (one that only contained the responses of principals appointed on merit) could produce evidence of a stronger relationship.

Perhaps there are variables other than those measured in the course of this research that influence *transformational leadership*. For example, it may be that fewer teachers aspire to positions of senior management because of the increased performance expectations. As a result, the quality of those who apply for these positions may be well below that possible if a broader range of personnel wished to become principals. Incorporation of some measure of principal quality or motivation to become a principal into the survey design may have provided some valuable insights. It is also possible that the culture existing

within the teaching profession, one that exhibits a high level of union influence (Caldwell & Spinks 1998), is not conducive to change, and any efforts of transformational principals are consistently countered. Perhaps even the influence of the public sector 'mentality' within state schools acts as a barrier to principals' attempts at transformation.

Some insight into these problems can be gained from an examination of five out of twelve 'constraining forces' of school-based management (SBM) identified by (Caldwell & Spinks 1998). Although these constraints relate to the implementation of SBM processes, some may partly explain the lack of a strong link between *psychological empowerment* and *transformational leadership*. The five that are thought by Caldwell & Spinks (1998) to provide such explanation are summarised as follows¹⁰⁴.

1. *Accountability requirements* (p. 83)

SBM in schools is constrained by accountability requirements, with authorities and responsibilities constrained by the Minister of Education, who exercises a capacity to withdraw these at any time. Within Victoria, the implementation of the *School Charter* is a much weaker concept than that originally envisaged. As specified in the Victorian *Education Act 1958*, Section 15L, a *School Charter* does not create any contractual relationships and does not give rise to any rights or entitlements, or impose any duties that are capable of being enforced in a legal proceeding. Interpreted literally, this and other provisions of the Act are constraining.

2. *Inertia and tendencies for re-centralisation* (p. 84)

Here, Caldwell identifies a number of obstacles to the operation of SBM. One source is the existence of two levels of government that provide funding to schools. The Australian Commonwealth Government provides funding to schools as well as the Victorian government. When different parties hold government at each level problems of a political nature act as a source of inertia. In addition, a level of resistance is encountered from bureaucrats within the central education administration whose jobs are threatened by decentralisation policies.

¹⁰⁴ The remaining seven of twelve 'constraining forces' thought not to be relevant to the *transformational leadership* of individual principals are the registration requirements of teachers, Commonwealth-State arrangements, international obligations, funding mechanisms for schools, the knowledge/skills of staff, industrial relations frameworks and values in public policy.

3. *Selection of staff to meet the needs of a system* (p. 88)

Although the aim of SBM is to allow for the school-based appointment of staff (this is known within Victoria as 'Full Staffing Flexibility'), this was not possible in the early years of *Schools of the Future* because of the large pool of teachers who were 'in excess'. When a vacancy occurred within one school, this was filled with a teacher from another school who was 'in excess'. Principals may view this as constraining.

4. *Curriculum and standards frameworks* (p. 90)

All schools in receipt of public funds internationally are required to work within frameworks for curriculum and standards. As such, there are no truly independent schools. The operation of these standards frameworks inevitably leads to constraints to SBM. This is the case despite the fact that there is a great deal of flexibility arising out of the imposition of curriculum 'frameworks', rather than curriculum 'syllabus'¹⁰⁵.

5. *Stance of teacher unions* (p. 94)

Over many years prior to the introduction of *Schools of the Future*, there was a close alignment between Victorian Labour Governments and teacher unions. This resulted in a constraint to SBM. In general, teacher unions (for example, the Australian Education Union) viewed SBM as a market-driven reform of the New Right, focused on increasing central control and diminishing resources to public education (Devereaux, Edsall & Martin 1996). As a consequence, teacher unions opposed virtually every self-management initiative.

Outcomes of transformational leadership

As anticipated, *transformational leadership* was found to exert a strong and positive influence on *innovation in management structure*, confirming that transformational leaders bring about change within their organisations. This means that school principals who demonstrate characteristics of *transformational leadership* are likely to bring about second-order changes within their schools, building structures that facilitate the collaborative cultures and emphasising collaborative decision-making referred to by Leithwood (1992).

¹⁰⁵ Curriculum syllabi are prescriptive. They are, therefore, much more constraining.

The overall aim of the thesis was to provide a better understanding of *psychological empowerment* and *transformational leadership* and the role they play in the governance of large Victorian state schools. This has been achieved through the development and empirical testing of a structural equation model. The final, refined model lends support to the contention that a clear understanding of the role of principal and provision of adequate resources both contribute to principals' feelings of empowerment. The system of accountability, while providing principals with valuable strategic information, does not appear to improve their sense of empowerment and may, in fact, inhibit it. The model also supports the idea that the level of empowerment felt by principals affects the extent to which they exhibit characteristics of transformational leadership, although not greatly. A final conclusion is that transformational leaders do bring about innovation.

8.5 Research contributions

The purpose of this section is to identify ways in which this thesis addresses the gaps in the cited literature and to explain the contributions to theory and policy development.

8.5.1 Contribution to theory development

Developing the nomological network of psychological empowerment

A major contribution of this thesis is in identifying support for a partial nomological network of *psychological empowerment* in the workplace¹⁰⁶ and the role it plays for managers in a context different from that identified in prior research. Whereas earlier studies were conducted within the private sector (for example, *Fortune 500* employees in the early 1990s), support has been identified in this thesis for a modified model tested using the perceptions of school principals in the Australian public sector in the early 21st Century. Thus, the basic operation of the network has demonstrated stability across time, culture and location within the private/public ownership dichotomy and provides further evidence of the efficacy and generalisability of the model. In proposing and testing a structural model of *psychological empowerment* within the framework of governance of state schools, this thesis provided empirical support for the role it plays in effective governance within those schools.

¹⁰⁶ A diagrammatic representation of the original partial nomological network is contained in Figure 8-1.

A further contribution to theory arises from the review of certain variables and their interrelationships within Spreitzer's (1995) partial nomological network. The first point of modification involves the exclusion of variables deemed inappropriate. Some were deemed to be inappropriate to the research context (for example, 'contingent rewards' was excluded since no incentive exists for principals other than salary). Others failed to achieve measurement adequacy (for example, *self-esteem* was excluded as a predictor of *psychological empowerment* and both *risk profile* and *need for achievement* were excluded as predictors of *transformational leadership*).

The second point of modification involved the re-specification of the structural model. The relationship between *psychological empowerment* and a measure of innovation was altered to the extent that *transformational leadership* was inserted as an intervening variable. No prior research has modelled *transformational leadership* in the same way, but instead mapped innovation as a direct outcome of *psychological empowerment* (Spreitzer *et al.* 1999).

The final part of the model describes a link from *innovation in management structure* to *improvements in management effectiveness*, suggesting that improvements arise out of innovation. This relationship may not hold in all circumstances; nevertheless, it is incorporated into the model for purposes of completeness. Although this relationship is not tested empirically, it is included in order to demonstrate that improvements in management effectiveness follow innovation.

Support identified for the modified model demonstrates its applicability within the research population. The final model, distilled as a result of theoretical restructuring and data analysis, is represented in Figure 8-3 and shows the direction and strengths of identified relationships. This model represents a contribution to knowledge by providing further evidence both of the usefulness of Spreitzer's (1995) model and support for its operation within a public sector environment.

Developing the understanding of multi-dimensional variables

A contribution of this thesis is finding support for the conceptualisation of both *psychological empowerment* and *transformational leadership* as multidimensional variables, in a context different from that of prior research. It confirms the findings of prior research and implies that research involving these variables needs to consider them as higher-order variables.

The contribution relating to *psychological empowerment* is that support has been found for the view held by Zimmerman (1990); that considering this variable as a unidimensional variable may promote an overly simplistic conception of empowerment and limit its understanding. It was demonstrated that *psychological empowerment* is a second-order variable comprising *competence, impact, meaning and self-determination*¹⁰⁷.

The contribution relating to improving the understanding of *transformational leadership* as a multi-dimensional variable, however, is not as clear as it is for *psychological empowerment*. While support was found for the inclusion of *charisma, inspiring subordinates and strategic vision and articulation* as dimensions of *transformational leadership, intellectual stimulation* was excluded since it demonstrated evidence of multicollinearity. It was difficult to define this variable's effect as a dimension of *transformational leadership* (Hair *et al.* 1998). While the final conceptualisation retains evidence of the existence of multicollinearity, the final three-dimensional variable has constrained this problem to tolerable limits. This suggests that the measurement of *transformational leadership* remains problematic.

8.5.2 Contribution to policy development

The *Schools of the Future* program called for a high level of self-management within a curriculum and standards framework (Caldwell & Spinks 1998). The objectives and purposes of the program are summarised in Hayward (1993) and those that are relevant to the conclusions in this thesis are as follows.

- *Encourage the continuing improvement in the quality of educational programs and practices in Victorian schools to enhance student learning outcomes;*
- *Actively foster the attributes of good schools in terms of leadership, school ethos, goals, planning and accountability process;*
- *Allow principals to become true leaders in their school with the ability to build and lead their teaching teams;*
- *Enable communities, through the school charter, to determine the destiny of the school, its character and ethos;*

¹⁰⁷ This is subject to the need for caution when considering the *meaning* dimension in certain populations. This issue is addressed in Sections 3.4.3 and 4.8.

- *Within guidelines, enable schools to develop their own programs to meet the individual needs of students; and*
- *Be accountable to the community for the progress of the school and the achievements of its students.*

While the objectives listed here are not addressed in this thesis directly, certain aspects are relevant. In particular, references to accountability, the emphasis on enhancement of student learning outcomes (effectiveness), the aim of improving the leadership skills of principals and the emphasis on prospective thinking are all related to the research aims of this thesis. The overarching emphasis of the *Schools of the Future* program, however, is self-management. In this thesis, an aspect of self-management is captured by the variable *psychological empowerment*. This is the feeling that empowerment experienced by a principal as to the extent to which they control the operations of their school. The granting of self-management to principals will have minimal impact, it is argued here, if an increase in principals' *psychological empowerment* does not result.

From a policy-development perspective, therefore, the contribution this thesis makes is to provide insights into variables that affect principals' perceptions of empowerment. The objective that *Schools of the Future* allows principals to 'become true leaders in their school' is addressed, administratively, with the devolution of decision-making capability to them. At an individual level, however, principals will 'feel' empowered to run their schools to varying degrees. Variables that influence that sense of empowerment have been identified in this thesis. The level of influence that *psychological empowerment* has on *transformational leadership* has also been identified.

The variables that are identified as increasing empowerment are *role clarity* and *availability of resources*. If it is determined that it is important to improve principals' perceptions of empowerment, therefore, attention should be given to these two variables and judgements made about the extent to which they can be increased. Suggestions relating to the implications of this finding are contained in the following section.

The reference, in the stated objectives, to 'encourage the continuing improvement in the quality of educational programs and practices' is an indication that principals need to take a proactive, rather than a sustaining, role in the process of achieving this objective. They should engage, to some extent at least, in leadership practices that are transformational, rather than merely transactional. A significant conclusion in this thesis is that

psychological empowerment influences *transformational leadership*, if only to a modest extent.

It appears that improving principals' sense of empowerment will influence the extent of their *transformational leadership*, although other variables need to be identified as well. As discussed in Section 8.4.2, there are some variables that require attention. These include an increase in the availability of quality aspirants to principal positions and a change of teacher unions and school communities' attitudes towards SBM. In relation to aspirants, it may be necessary to increase funding to schools in order to offer more appropriate levels of financial reward to principals who are willing to take on the responsibilities of leadership. It may also be necessary to provide funds directed at the provision of better support in terms of assistants who are able to share more of the leadership burden. With regard to the latter, it may be necessary to implement education and marketing policies that identify and highlight the benefits of SBM to teacher unions and school communities.

Most important of the conclusions for policy development, however, is that principals do not appear to place value on the strategic information produced as a result of the operation of the compulsory accountability process (the *Charter/Triennial Review*). Overall, it appears that principals view this process primarily as one of accountability and not one that provides valuable management information. This perception, to some extent, undermines their feelings of empowerment. This is understandable given its compulsory nature, creating a perception that fulfilling its requirements prevents them from 'getting on with the job'. From a policy-development perspective, it is accepted that there would be a degree of resentment felt by any operational manager towards any sort of compulsory accountability process. However, it is not suggested that such processes should be discontinued. From a corporate government perspective, governments and their departments need to maintain strong links of accountability between themselves and their operational units.

8.6 Implications and recommendations

The purpose of this section is to identify the implications of the research findings, answering the important 'so what?' question. It contains recommendations for future research for both theory and policy development.

8.6.1 Implications for theory

The measurement of psychological empowerment

A point of qualification for the measurement of *psychological empowerment* is the exclusion of the *meaning* (or 'meaningfulness') dimension for the population examined in this thesis (as well as for similar populations of managers in the 'helping' professions). *Meaning* was excluded due to reported unacceptable levels of negative skewness¹⁰⁸. Although the *meaning* dimension was found to be inappropriate for the measurement *psychological empowerment* for state school principals, it does not mean that it is of no relevance to the variable generally. It does, however, indicate that there is a need for care when measuring *psychological empowerment* in the teaching and other 'helping' professions, including aged care and health. Here, members are likely to demonstrate high levels of job meaningfulness and patterns of responses need to be scrutinised for inappropriate (excessive) levels of skewness. The motivations of these respondents differ from those of raters used in prior research including, for example, managers of *Fortune 500* corporations (Spreitzer, Kizilos & Nason 1997, Spreitzer *et al.* 1999) middle managers (Spreitzer & Quinn 1996) and service workers (Corsun & Enz 1999).

The implication of this finding is that careful attention must be given to assessing the suitability of sets of data in terms of their distributions and excluding those that fall outside the range of acceptability. Published literature describing the use of structural equation modelling provides little information about data distributions, or explanations about the suitability of data for this type of analysis. Although dimensions not achieving acceptable distribution patterns should be excluded from such analyses, explanations should be provided to explain why such a distribution might have arisen. This should be followed by a consideration of their implications and whether they should be included in data analysis (especially when structural equation modelling is used).

The measurement of transformational leadership

The conceptualisation of *transformational leadership* in this thesis was adapted from Leithwood (1994), and Leithwood and Jantzi (1997), who sought an explanation for variations in teachers' perceptions of school principals' leadership. However, prior research has identified the measurement and conceptualisation of *transformational*

¹⁰⁸ Extreme skewness is indication of a variable's unsuitability for inclusion in structural equation modelling.

leadership to be problematic, revealing conceptual weaknesses. For example, it has been suggested that there is a difference between transformational leaders and charismatic leaders as follows.

A transformational leader is more likely to take actions that will empower followers and make them partners in a quest to achieve important objectives. A charismatic leader seems more likely to emphasise the need for radical change that can only be accomplished if followers put their trust in the leader's unique expertise (Yukl 1999, p. 301).

The measurement of *transformational leadership* in this thesis contains elements of both these dimensions. It supports, to some degree, the conceptualisation of *transformational leadership* as a multi-dimensional variable, although its measurement fails to provide a clear understanding of how its underlying dimensions combine to produce a single variable. Future research needs to focus on identifying leadership behaviours that produce the type of change necessary to improve organisational outcomes. Only when these behaviours are identified will it be possible to devise strategies that encourage leaders possessing these qualities.

Clarifying outcomes of psychological empowerment

The relatively weak relationship produced between *psychological empowerment* and *transformational leadership* suggests that other variables influence leadership that encourages the sorts of organisational change that are desirable. The problem may lie in the conceptualisation and measurement of *transformational leadership*. In particular, the failure to understand the extent to which *transformational leadership* differs from charismatic leadership and the extent to which the two concepts overlap, has been identified as a cause for concern (Yukl 1999). Whereas the approach taken in this thesis was to treat *transformational leadership* as a single variable, combining dimensions of *charisma*, *inspiring subordinates* and *strategic vision and articulation*, future research should consider separating the two underlying dimensions. This may produce better explanatory power for *psychological empowerment*.

8.6.2 Implications for policy development

The stated aims of *Schools of the Future* include the improvement of learning outcomes for students. The overarching conclusion of the research described in this thesis is that the

revised model describing the role of *psychological empowerment* offers a partial explanation for its effect upon improved management effectiveness. In terms of the research population this translates, at least in part, to improved student learning outcomes. Variables found to comprise the final model are discussed in turn.

Role clarity

A conclusion of this research is that principals' perceptions of *role clarity* strongly affect their feelings of empowerment. It is therefore evident that improving the understanding of the role principals are expected to play is important. This is especially so when the role played by principals within the newly decentralised system is different from the role performed by principals under the previous, centralised system.

The recommendation arising from the conclusions in this thesis is the necessity for education programs aimed at providing clarification of the role to be played by principals under *Schools of the Future* and other school-based management systems. Education programs directed at improving the understanding of the new role should be made available to both incumbent principals and those aspiring to the position. Indeed, it is recommended that aspirants are able to demonstrate their understanding of the role before becoming eligible to apply for the position of principal.

The value of strategic information

While no clear conclusions about this relationship are possible, it is apparent that, on balance, principals do not regard the *School Charter/Triennial Review* process as one that produces strategic information of value. Any value placed on the information generated from this system appears to be outweighed by feelings of annoyance at the imposition of this process, principals viewing it merely as satisfying compulsory accountability requirements. The process may interfere with principals' feelings of empowerment. If the motivation of policy makers in mandating this requirement were to provide principals with valuable information, on balance it cannot be said to have succeeded. It does not appear to have enhanced their sense of empowerment.

Two recommendations arise from these conclusions. First, it is suggested that systems are devised that engage principals in effective strategic management development. These systems need to focus directly on the long-term needs of their school and the community that it serves. Systems are needed that identify and implement systems that enhance the performance of schools over the long term. These plans need to focus on the creation of

ongoing compatibility between the internal skills and resources of the school and the changing external environment within which it operates. Systems developed in this way would generate the type of information that influences *psychological empowerment* referred to in the literature (Spreitzer 1995a). Information relating to the school's mission and information that notifies principals of the extent to which that mission has been achieved needs to be generated from a process that is 'owned' by school management.

Second, it is recommended that systems of accountability need to be decoupled from the strategic management systems. It is unclear whether it was the intention of the architects of *Schools of the Future* to direct schools towards the adoption of strategic planning. However, if it is the intention that schools be encouraged to adopt these procedures, they ought to be introduced as stand-alone systems, meaningful to the school's management team and all of the school community.

The importance of providing adequate resources

A variable found to influence principals' feelings of empowerment in a positive direction is the availability of adequate resources for their schools. That is, principals will feel more empowered the stronger their perception that they have access to resources sufficient to do their job well and to implement new ideas. This is not necessarily a recommendation that governments summarily increase the allocation of resources to schools, however, as the following analysis reveals.

Resourcing issues for state schools are important, as spending on education accounts for around 25% of total State Government of Victoria expenditure, a total of \$5,659,000,000 (24.45%) in the 1999-2000 year (Australian Bureau of Statistics 2002). This represents the greatest proportion of State Government of Victoria spending in that year, with expenditure on health representing the next highest proportion (\$5,118,000,000 or 22.12%). Any government would be keen to introduce efficiencies into the education system in order to minimise total expenditure, especially at a time when surplus budgets are perceived to be desirable.

From this analysis it is apparent that provision of resources to schools at a level of perceived adequacy has important policy implications. Adequate resourcing enables principals to provide education programs for their school community that meet their needs. However, this needs to be balanced against the budgetary constraints of government and the tolerance of taxpayers for increases in taxation. If increasing resources to schools

brings about empowerment of school principals, this may result in other desirable outcomes, such as increased efficiencies. This could be achieved through a lower reliance upon resources from the central government, for example, and a greater motivation to generating funds through the attraction of more students. The effect of this would be to increase the funding base, take advantage of economies of scale and improve the curriculum offered, thereby attracting more students.

The importance of innovation in management

Innovation is the adaptation of products and processes that are new to the organisation that have been created both inside and outside that organisation (Woodman et al. 1993). Thus, the emphasis for this thesis is the extent to which principals implement procedures and processes that are new to the school. This is a broader conceptualisation of innovation than the narrow meaning of innovation as 'original'.

Innovation is seen as an essential ingredient of the *Schools of the Future*. Commenting on the need for reform prior to the introduction of this initiative, the Honourable Doug Hayward (formerly Shadow Minister for Education in the Victorian State Parliament and then State Minister for Education who introduced *Schools of the Future*) declared,

Students need to access a diverse range of innovative providers of educational services that would meet the individual needs of each student so as to bring out the student's full creativity and potential (Caldwell & Hayward 1998, p. 33).

With respect to innovation within schools, the need for change has been summarised as follows.

The central issue in any consideration of recent reform, especially that part that has entailed the introduction of the self-managing school in the public sector, is the relationship between reform and outcomes (Caldwell & Spinks 1998, p. 39).

Thus, the prime consideration of reforms involving SBM is that change results. In order for such change to occur it is necessary that schools, under the leadership of their principals, seek and implement innovations that will bring about the outcomes to which the above quote refers. Innovation needs to be facilitated. The motivation for SBM within the USA is summarised as follows.

[School districts in the USA] are implementing school-based management today to bring about a significant change in education: the empowering of school staff to create conditions in schools that will facilitate improvement, innovation and continuous professional growth (Herman & Herman 1992, p. 162).

Once SBM has been actuated, the task remains to identify what other variables are needed to facilitate leadership that is transformational in nature. The conclusions of this thesis indicate that there is little support for the notion that feelings of empowerment on their own will encourage these traits in principals.

One possible approach to increase the transformational qualities of principals' leadership is to implement an accreditation processes for persons aspiring to the role of principal. Under this process all aspirants would be required to undertake formal learning in courses that examine leadership and the processes necessary to develop and implement appropriate innovative policies and structures. Over time, principals would be appointed to the role with an understanding of the principles underlying the need for innovation and the processes by which innovation can be achieved.

8.7 Research limitations

It would be unusual in a study such as this, especially one carried out over an extended period of time, if there were not some aspects that would be completed differently if it were to be carried out again. This thesis is no exception. It is subject to both limits (imposed by the boundaries of the research question) and limitations in design and the way in which it was carried out.

In articulating a number of limitations to the research carried out in this thesis, it is prudent first to acknowledge a number of its strengths. First, a high number of usable responses was received, a total of 539 matched pairs of responses from each school from both the principal and one assistant principal. This represents 51.2% of the research population. This high number of responses is testament to the interest in the issues raised in the research and resulted in an increase in the statistical power of the analysis (Cohen & Cohen 1983). Second, while principals' perceptions of empowerment were used to measure their *psychological empowerment* and its antecedents, perceptions of their assistant principal were used to measure the outcomes of *psychological empowerment*; that is, *transformational leadership* and innovation. This procedure controlled for common

method variance, arising when data collected from one source are used to measure both dependent and independent variables (Luzzo 1993).

It is possible, however, that decoupling the survey in the manner described above may have had the effect of weakening the relationship between *psychological empowerment* and *transformational leadership*. Despite the identified advantages of the separation of the perceptions of principals and their assistants, it is possible that this process has resulted in a level of discontinuity that has influenced the hypothesised relationship. Data analysis may have produced a stronger relationship if principals had been asked to self-assess the dimensions of their own *transformational leadership*.

A number of limitations arise from the use of the survey design. Overall, the limitations identified in this section need to be viewed in the context of a study that is focused on theory development. Its purpose is to inform future work, rather than producing conclusive findings. As with any research, there are evident limitations that may inhibit the contribution of this study, although the rigorous data analysis of data permits future researchers to choose elements of this thesis that can contribute to their work. Future researchers need not accept the whole package of findings, limited as it is by its design and implementation.

8.7.1 The nature of surveys

Surveys can be distinguished from other research methods in the social sciences by the form of the data collection and the method of analysis. The survey method refers to an investigation where,

- (a) *systematic measurements are made over a series of cases yielding a rectangle of data,*
- (b) *the variables in the matrix are analysed to see if they show any patterns;*
- (c) *the subject matter is social* (Marsh 1982, p. 6).

The survey design was chosen for this thesis since it was perceived as the most appropriate given the nature of the research question. The research centres on a well-developed theoretical framework and clearly defined variables, developed from the existing literature. Only variables that were assessed as valid and reliable were included in the final data analysis underpinning hypothesis testing.

The choice of design always involves a trade-off, however. Other designs provide advantages not possible using a survey. Field study designs, for example, facilitate 'in-depth' data collection and analysis, enabling a richer understanding of the subject of the research. Using an experimental design, on the other hand, allows the researcher to gain high levels of confidence that the variables under investigation operate causally in the manner hypothesised, allowing the researcher more scope in the generalisation of findings. These designs have their own disadvantages, however. With field studies, conclusions are drawn from a narrow band of informants, a trade-off having to be made between breadth and depth of field coverage. With experiments, since there is a need to control the environment within which the research takes place, it is not possible to explore the complexities associated with the phenomena of interest (Abernethy *et al.* 1999).

Survey designs also have disadvantages. Chief amongst these is the fact that surveys do not permit respondents to clarify interpretive difficulties with the designer of the survey and to uncover useful insights of a qualitative nature. In addition, care needs to be taken with the results of data analysis. Although use of structural equation modelling in testing hypotheses provides strong support for the cause and effect relations described in the hypothesised model, care should be taken with the interpretation of these results. The cross-sectional nature of the survey design ignores the temporal dimension involved in collecting data through a vertical slice of time. This precludes conclusions that directly identify cause and effect. Surveys do permit the researcher to draw inferences about relationships, although conclusions about causality cannot be made in the same way as with experimental designs.

8.7.2 Role of strategic information

Changing the emphasis of the measurement of strategic information from 'access to' to 'value of' that information did not capture the variable as it was intended. While the aim of the research was to tap into the extent that principals valued strategic information, it appears that they focused on their accountability responsibilities. With the benefit of hindsight it would have been more effective to measure principals' attitude to strategic information in other ways. This, however, identifies a way forward for future researchers.

8.7.3 Generalisability

A major contribution of this thesis is conducting the research within a particular research environment. Whereas prior research was carried out in the private sector, research in this thesis was limited to the population of principals of large Victorian state schools. By

limiting the population to this narrow range of management perceptions, however, care is needed in the interpretation of the findings and the generalisability of the research conclusions. While it is not contended that generalisations can be made in regard to managers operating in all other environments, the conclusions provide a degree of insight into the relationships between variables that are relevant to all managers and policy makers.

8.7.4 Measurement of key variables

Both of the key variables in this research (*transformational leadership* and *psychological empowerment*) were measured using the perceptions of principal class officers. They were hypothesised, constructed and measured as second-order structural equation models.

It may be that this conceptualisation is inappropriate and that there are more appropriate first-order variables that capture the variable more effectively. However, at the time that the research was designed, these variables were determined to be the most appropriate.

It is also possible that it is inappropriate to measure the key variables using the perceptions of key players and that a more suitable approach would have been to identify more objective means of measurement. Again, such measures were not apparent at the time the research design was being developed.

In addition, there is a possibility that questions used to measure key variables would have been developed more fittingly using inductive processes and that a case study design would be more appropriate than using measurement items found in the literature. Due to time constraints, however, this approach was not taken. Following a review of the existing items it was felt that previously developed items were suitable for adoption into the model.

8.7.5 Omission of certain variables

Statistical testing of a number of the variables in the hypothesised model failed to achieve scale adequacy. This was attributed mainly to the restriction in the number of indicators set for their measurement, a constraint imposed in order to keep the number of measurement questions in the survey forms to a minimum, thereby maximizing the survey form return rate. As a consequence it was not possible to test all of the hypothesised relationships contained in the hypothesised model. Although many of these variables were included in the model for purposes of completeness (and to minimise specification error),

there is support in the literature for their place in the model. Failure to provide valid measures for these omitted variables represents a limitation to the thesis, however.

8.7.6 Data analysis

While every care was taken in conducting the data analysis, compromise and consequent limitations to the analysis were inevitable. This is the case with any research design. The purpose of this section is to identify and articulate the extent of these limitations.

Nonnormality of data set and sample size

A limitation of the data analysis is the use of data distributions that do not conform to the multivariate normality criterion. Despite the fact that such patterns of nonnormality are to be expected in behavioural research (Micceri 1989), the presence of this characteristic in the data requires explanation.

Statistics associated with structural equation modelling (SEM), notably the conventional estimation procedure of maximum likelihood (ML), are based on the assumption of multivariate normality (Jöreskog 1969, Bollen 1989). Due to evidence of multivariate nonnormality, however, the weighted least squares WLS estimation procedure was used since normality assumptions are not required. While this procedure provides a solution to the problem and is said to give consistent parameter estimates in a variety of distributions (Yuan 2000), it requires a very large sample size. However, the exact size of the sample required, or the extent of its nonnormality before this process can be implemented, is unclear¹⁰⁹. Nonetheless, the size of the sample used for empirical analysis in this thesis ($n = 539$) is thought to be acceptable for certain evaluations of adequate fit, though on the lower end of acceptability (Hu & Bentler 1995). It falls well short of the recommended sample size for WLS of 5,000, however.

In support of the findings using WLS, the analysis conducted in this thesis was carried out using a model with ten observed variables and fourteen estimated parameters. It cannot be described as 'complex'. In addition, the sample size was relatively large for a project undertaken in social science, exceeding the minimum in situations of nonnormality of 500 (Hu & Bentler 1995). The sample size of 539, while at the lower end of acceptability,

¹⁰⁹ For example, it has been suggested that a sample size of in excess of 1,000 responses is required for 'relatively simple models' (West et al. 1995, pp. 68-69). No indication is given as to what constitutes a 'simple' model.

meets the 'minimum' suggested for use of WLS for some measures of fit. Improvement in the model when WLS is run, compared with ML, produces a model that largely satisfies conditions of acceptable fit.

Nonetheless, evidence of nonnormality could, to some extent, be expected. As with the *meaning* dimension of *psychological empowerment*, it could be anticipated that state school principals (indeed managers of all types) would, overall, report consistently high levels on most of the scales in the model. In such instances nonnormality could be perceived as 'normal'.

Treating ordinal variables as continuous

Variables in this thesis were analysed using a seven-point Likert scale. Although this has been identified as a common procedure, especially in the case of research in psychology (Breckler 1990), there is an assumption that underlying each ordinal observed variable is an unobserved latent variable counterpart that has a continuous scale. Such is the assumption made in the analyses described in this chapter (as well as in Chapter 6). Chou, Bentler & Satorra (1991) argues that the best approach to this problem is, rather than use a different mode of estimation (for example, weighted least squares), to treat these categorical variables as if they were continuous (Byrne 2001). This is the approach taken when using LISREL and estimations are based on the asymptotic covariance matrices computed by PRELIS.

8.8 Directions for future research

Future research should extend and refine the theoretical framework. The purpose of this section is to assist future researchers in the selection and design of future studies aimed at improving the understanding of the role that *psychological empowerment* and *transformational leadership* play in the effective governance of large organisations. Many opportunities for future research arise from this thesis. Some suggestions for future research are outlined below.

8.8.1 New research populations

To enhance the generalisability of the findings, additional data should be collected from a wider variety of organisations. These should be drawn from different cultures and from individuals occupying different levels in the organisational hierarchy.

First, focusing similar research on the population of principals in Hong Kong (for example) would facilitate an examination of the effects of empowerment and transformational leadership in a different culture. Here, where school-based management systems similar to *Schools of the Future* have been introduced, there is an opportunity to investigate the role of cultural dimensions.

Second, it is possible that research focusing on managers lower in the hierarchy (for example, assistant principals) could provide insights into the effects of their superiors' sense of empowerment on their sense of empowerment. Such research might identify the extent to which an empowered principal influences the feelings of empowerment of lower level managers and the extent to which such feelings permeate the whole organisation.

8.8.2 Qualitative research

The limits constructed for a research project arising from its design provide opportunities for the application of different research designs in the future. This is certainly the case for this thesis. A richer understanding of the effects of *psychological empowerment* and variables that influence *transformational leadership* could be obtained, for example, by a closer examination of schools managed by principals who identify themselves as having a high sense of empowerment.

In particular, there is a need to identify principals engaged in developing strategic planning activities distinct from their *School Charter*. Indeed, it will be of considerable interest to track the development of the strategic plans of the principal interviewed *ex post facto*¹¹⁰. An examination such as this might uncover insights into the personal qualities and motivations of such a principal. It may also be instructive to identify the effects that such a course of action has on staff motivation and organisational outcomes.

8.8.3 Psychological empowerment and transformational leadership

It was proposed in this thesis that improving a principal's ability to bring about transformation and innovation within a dynamic environment such as education is a desirable outcome. It was proposed that improving principals' feelings of empowerment would achieve this. While there was evidence of a marginal positive effect, however, no strong relationship was identified between *psychological empowerment* and

¹¹⁰ Referred to in Section 8.4.2.

transformational leadership. This gives rise to two sets of questions that require further research.

First, research is needed to identify desirable outcomes of managers' *psychological empowerment*. Despite the initial enthusiasm for *psychological empowerment* as an explanatory variable for desirable outcomes, little evidence has been produced to support this contention. Prior research has shown that *psychological empowerment* within a work context has a positive influence on 'innovation' and 'upward influence' (reflecting attempts to influence someone higher in the authority hierarchy) (Spreitzer *et al.* 1999). However, there is a paucity of evidence that it influences other desirable outcomes. More research is required to identify such outcomes. Empowerment theory remains an enigma.

Second, much the same can be said for the failure to identify variables that influence a manager to take on qualities of *transformational leadership*. Weaknesses that have been identified in the theoretical conceptualisation (Yukl 1999) stand in the way of the explanatory power of this variable. Further research is required to clarify the conceptualisation of *transformational leadership*, to identify variables that influence this variable, and to identify outcomes that either prevent or inhibit desirable organisational outcomes.

8.8.4 Investigating the link with management effectiveness

The hypothesised model included, as an outcome, 'improvements in management effectiveness'. This relationship is not tested empirically in this thesis due to inherent problems in measuring management effectiveness and attributing it to any one variable. Future research should be devised to investigate this link, using measurements of school effectiveness developed within the education literature. In order to achieve this it is necessary to obtain data that provide measures of school performance, such as statistics relating to student performance. Such data have been collected and exists, though access is difficult. It is classified as *in cabinet in confidence* and is not available publicly.

8.9 Summary

This thesis set out to investigate whether the *psychological empowerment* of managers plays a significant role in the production of certain desirable leadership qualities and management outcomes. This is an important question since there has been a widespread change in governance away from centralised authority towards decentralised decision-

making. This change is taking place within both the private and public sectors. While there is an intuitive belief that these changes will bring about improvements in management outcomes, to date there is little empirical evidence to support this contention.

The research undertaken in this thesis addressed this question through the development and testing of a model of *psychological empowerment* adapted from a partial nomological network of empowerment devised by Spreitzer (1995a). The research was carried out within the Victorian State *Department of Education, Employment and Training*, the research population being the principals of its large schools. This model identifies certain variables as influencing principals' *psychological empowerment* and proposes that those who perceive themselves to be empowered will demonstrate high levels of *transformational leadership* leading to increased innovation in the management of their schools.

Data analysis reveals that two variables, *role clarity* and *availability of resources*, influence principals' *psychological empowerment*. Results also revealed that, although *psychological empowerment* influenced principals' *transformational leadership* (as perceived by their assistants), this influence was not strong. The conclusion reached, therefore, was that the mere act of transferring power to operational managers does not, in itself, ensure that principals will adopt leadership activities that are perceived as transformational.

The implication is that, if policy makers believe that it is desirable for principals to demonstrate characteristics of *transformational leadership*, policies other than those that improve feelings of principal empowerment will be needed. Without a transformational approach to management principals and other operational managers will be unable to facilitate the degree of change necessary to innovate to maintain or improve their organisations' competitive advantage.

Appendix A

Survey forms

This appendix contains copies of (blank) survey forms used to collect data for empirical analysis. Two survey forms are presented; one (printed on beige coloured paper) was for completion by principals, the other (printed on green coloured paper) was for completion by assistant principals. For purposes of presentation in this appendix, both are printed on white paper.

Survey Form — Principals

Directions for completion of this survey

This survey is designed to obtain descriptions of your attitudes to your work as a school principal. There are no right or wrong answers. We will use these items at La Trobe University to help build a model that describes the effects of principals' work orientation on management effectiveness. Please, wherever possible, respond to each question. Be as honest as you can.

Your responses will remain strictly confidential. This is a condition of approvals gained from both DEET (*Approval Number SOS 001284*) and the Ethics Committee of La Trobe University. No one will be able to identify your responses. The data will be aggregated; analysed and compiled into a report that will form part of the thesis I will submit to examiners to complete the requirements of the degree of Doctor of Philosophy. Your school has been assigned a number for data analysis purposes only. It will not be used to identify you. When you have finished, please return this survey directly to me using the enclosed self-addressed envelope.

1. Your personal details

What is your age? Male or Female? M F (circle)

What are your formal education qualifications?

Length of service as a Principal Class Officer (PCO).....years Length of service as a teacher (incl. PCO)years

Length of service as a principalyears

Your main areas of teaching (methods)

2. Your school's details

Number of enrolled students for 2001 Global Budget allocation for 2001 \$ Number of teaching staff for 2001 (EFT)

Primary or Secondary (P) P S (circle) Rural or Metropolitan R M (circle) Which region? (abbreviation)

4. Your work orientation

(circle the appropriate number on the scale showing how much you agree or disagree with each statement)

	Very strongly DISAGREE	1	2	3	4	5	6	7	Very strongly AGREE
I find satisfaction in exceeding my previous performance even if I do not outperform others.		1	2	3	4	5	6	7	
As a school principal, I can decide how to go about doing my work.		1	2	3	4	5	6	7	
I attempt tasks that I am not sure I can do more often than tasks I know I can do.		1	2	3	4	5	6	7	
I am more heavily reliant on non-financial information for running my school than information of a financial nature.		1	2	3	4	5	6	7	
My job as school principal is within the scope of my abilities.		1	2	3	4	5	6	7	

Continued over ...

	Very strongly DISAGREE							Very strongly AGREE		
	1	2	3	4	5	6	7			
If I were not good at something, I would rather keep struggling to master it than move on to something I can do easily.	1	2	3	4	5	6	7			
Overall, things are all mixed up in my life.	1	2	3	4	5	6	7			
I have autonomy in determining how I do my job as a school principal.	1	2	3	4	5	6	7			
I am not sure what my responsibilities are as a principal.	1	2	3	4	5	6	7			
The prospect of learning something new excites me.	1	2	3	4	5	6	7			
I have access to the resources I need to do my job well.	1	2	3	4	5	6	7			
I am self-assured about my capabilities to perform my work as a school principal.	1	2	3	4	5	6	7			
The explanation given to me concerning the role of principal is clear to me.	1	2	3	4	5	6	7			
I have little opportunity for independence in how I carry out my job as a school principal.	1	2	3	4	5	6	7			
Problems experienced by schools can be avoided through planning and analysis.	1	2	3	4	5	6	7			
I am confident about my ability to perform my job as a school principal.	1	2	3	4	5	6	7			
I undertake decision-making cautiously, seeking to minimise uncertainty.	1	2	3	4	5	6	7			
When I need additional resources to do my job, I can usually get them.	1	2	3	4	5	6	7			
The School Charter and Triennial Review are valuable events in the operating cycle of this school.	1	2	3	4	5	6	7			
I do not have much control over what happens in my school.	1	2	3	4	5	6	7			
My education is never complete.	1	2	3	4	5	6	7			
I value information that indicates whether the goals set out in the School Charter have been attained.	1	2	3	4	5	6	7			
I make decisions that are characterised by enterprising spirit that thrives on risk.	1	2	3	4	5	6	7			
My reliance on accounting information for decision making is increasing.	1	2	3	4	5	6	7			
I have not yet mastered the skills necessary for my job as a school principal.	1	2	3	4	5	6	7			
My opinion counts in decision-making within my school.	1	2	3	4	5	6	7			
My impact as school principal on what happens in this school is considerable.	1	2	3	4	5	6	7			
Forces beyond its control shape the competitive environment in which my school operates.	1	2	3	4	5	6	7			
Lack of resources is a barrier to proper management of my school.	1	2	3	4	5	6	7			
I care about what I do in my job as school principal.	1	2	3	4	5	6	7			
I have the support I need from my management team to do my job well.	1	2	3	4	5	6	7			
Accounting information is of no assistance in managing my school.	1	2	3	4	5	6	7			

Continued over ...

	Very strongly DISAGREE							Very strongly AGREE		
	1	2	3	4	5	6	7			
Part of the satisfaction in doing something comes from seeing how good the finished product looks.	1	2	3	4	5	6	7			
I would rather do something at which I feel confident and relaxed than something that is challenging and difficult.	1	2	3	4	5	6	7			
I feel certain about how much authority I have in my job as principal.	1	2	3	4	5	6	7			
I do not believe that I have much more learning to do.	1	2	3	4	5	6	7			
I have the support from the school council to do my job well.	1	2	3	4	5	6	7			
The work I do as school principal is meaningful to me.	1	2	3	4	5	6	7			
Decisions I make are based strictly on realistic and objective cost/benefit assessment.	1	2	3	4	5	6	7			
There are many things about myself I would change if I could.	1	2	3	4	5	6	7			
I can obtain the resources necessary to support the implementation of new ideas.	1	2	3	4	5	6	7			
As a person, I'm a lot of fun to be with.	1	2	3	4	5	6	7			
It is not wise to make strategic plans far ahead because many things may turn out to be a matter of good or bad fortune.	1	2	3	4	5	6	7			
I use personal initiative in carrying out my work as a school principal.	1	2	3	4	5	6	7			
It is no use playing a game when you are playing with someone as good as yourself.	1	2	3	4	5	6	7			
I know what is expected of me in my role as principal.	1	2	3	4	5	6	7			
I have influence over what happens in my school.	1	2	3	4	5	6	7			
I like to see decision-making that leads to dramatic changes in strategy taken in large, bold steps.	1	2	3	4	5	6	7			
I believe that goals of the school, as set out in the School Charter, are appropriate signposts to success.	1	2	3	4	5	6	7			
I am willing to undertake learning opportunities whenever they arise.	1	2	3	4	5	6	7			
Becoming a successful school is a matter of creating opportunities — luck has little or nothing to do with it.	1	2	3	4	5	6	7			
The work that I do as a school principal is important to me.	1	2	3	4	5	6	7			
I am popular with people my own age.	1	2	3	4	5	6	7			
I prefer to work in situations that require a high level of skill.	1	2	3	4	5	6	7			
I get a sense of satisfaction out of being able to say I have done a good job on a project.	1	2	3	4	5	6	7			
I do not have the support I need from my subordinates to do my job well.	1	2	3	4	5	6	7			
I have the support from the school parent body to do my job well.	1	2	3	4	5	6	7			
My job activities as school principal are not personally meaningful to me.	1	2	3	4	5	6	7			
I rely on the information fed back to me during the Triennial Review process.	1	2	3	4	5	6	7			
I am looking for new ways to use accounting information to assist with resource allocation within this school.	1	2	3	4	5	6	7			

Questions end: see over for instructions ...

Survey Form — Assistant Principals

Directions for completion of this survey

This survey is designed to obtain your perceptions of the way the principal of your school operates. There are no right or wrong answers. We will use these items at La Trobe University to help build a model that describes the effects of principals' work orientation on management effectiveness. Please, wherever possible, respond to each question. Be as honest as you can.

Your responses will remain strictly confidential. This is a condition of approvals gained from both DEET (*Approval Number SOS 001284*) and the Ethics Committee of La Trobe University. No one will be able to identify your responses. The data will be aggregated, analysed and compiled into a report that will form part of the thesis I will submit to examiners to complete the requirements of the degree of Doctor of Philosophy.

Your school has been assigned a number for data analysis purposes. This number appears on this survey. We will not use this number to identify you. When you have finished, please return this survey directly to us using the enclosed self-addressed envelope.

Your personal details

What is your age? Male or Female? M F (circle)

What are your formal qualifications?

Length of service as a Principal Class Officer (PCO) years

Length of service as a teacher (*including PCO*) years

Your main areas of teaching (methods):
.....

Your school's details

Rural or Metropolitan Primary or Secondary (S) P S (circle) Which region? (abbreviation)

Continued over ...

Please return this survey form to us in the prepaid envelope provided.

Thank you for your assistance with our research.

... **END**

Your principal's work orientation

Circle the appropriate number on the scale showing how much you agree or disagree with each statement.

	Very strongly DISAGREE	1	2	3	4	5	6	7	Very strongly AGREE
The principal facilitates opportunities for staff to learn from each other.	1	2	3	4	5	6	7		
The principal has a capacity to provide a source of inspiration for others within the school.	1	2	3	4	5	6	7		
The principal searches for innovations and constant improvements.	1	2	3	4	5	6	7		
The principal arouses awareness about important issues.	1	2	3	4	5	6	7		
The principal consistently generates new ideas for the future of the school.	1	2	3	4	5	6	7		
The principal encourages me to develop/review professional goals consistent with school goals.	1	2	3	4	5	6	7		
The principal seeks different views about how the school should operate.	1	2	3	4	5	6	7		
The principal experiments with new concepts and procedures.	1	2	3	4	5	6	7		
The principal is inspirational, able to motivate by articulating effectively the importance of what members of the school community are doing.	1	2	3	4	5	6	7		
The principal has a capacity to excite people with a vision of what might be accomplished if they work together.	1	2	3	4	5	6	7		
The principal has vision, often brings up ideas about possibilities for the future.	1	2	3	4	5	6	7		
The principal displays power and confidence.	1	2	3	4	5	6	7		
The principal suggests new ways of doing things within the school.	1	2	3	4	5	6	7		
The principal emphasises the collective mission (School Charter)	1	2	3	4	5	6	7		
The principal is entrepreneurial; seizes new opportunities in order to achieve goals.	1	2	3	4	5	6	7		
The principal has a capacity to raise people to new levels of effort.	1	2	3	4	5	6	7		
The principal comes up with inventive ideas.	1	2	3	4	5	6	7		
The principal talks of values.	1	2	3	4	5	6	7		
This principal exhibits a capacity to get staff and students to believe they can overcome anything.	1	2	3	4	5	6	7		
The principal does problem solving in clever, creative ways.	1	2	3	4	5	6	7		

Continued over ...

Innovation

For each of the sections below, please indicate your level of agreement with the statement in **bold italics** by circling the appropriate number on the scale showing how much you agree or disagree with each statement.

Very
strongly
DISAGREE

Very
strongly
AGREE

Innovation in curriculum

The principal actively promotes innovation in curriculum within this school. 1 2 3 4 5 6 7

Innovation in pedagogy

The principal actively promotes innovation in pedagogy within this school. 1 2 3 4 5 6 7

Innovation in management structure

For example:

- Re-design of administrative responsibility,
- Development of project teams.

The principal actively promotes innovation in management structures within this school. 1 2 3 4 5 6 7

Innovation in education design

For example:

- Integration of learning with external factors (eg parents, the wider community and employers),
- Focusing more on the individual needs of students,
- People networking and
- Introduction of online learning opportunities.

The principal actively promotes innovation in education design within this school. 1 2 3 4 5 6 7

Please return this survey form to us in the prepaid envelope provided.

Thank you for your assistance with our research.

... END

Appendix B

Measurement questions

This appendix contains the measurement questions used for the indicators of the multivariate items used in the structural model. The purpose of this appendix is to assist the reader by grouping the indicators according to their hypothesised latent variable. Raters (principals or assistant principals) are indicated in parentheses.

Dimensions of *psychological empowerment* (principals)

Competence

- COMP1 I am confident about my ability to perform my job as a school principal.
- COMP2 My job as school principal is within the scope of my abilities.
- COMP3 I am self-assured about my capabilities to perform my work as a school principal.
- COMP4 I have not yet mastered the skills necessary for my job as a school principal.

Impact

- IMPACT1 My impact as school principal on what happens in this school is considerable.
- IMPACT2 I do not have much control over what happens in my school.
- IMPACT3 I have influence over what happens in my school.
- IMPACT4 My opinion counts in decision-making within my school.

Meaning

- MEANING1 The work that I do as a school principal is important to me.
- MEANING2 My job activities as school principal are not personally meaningful to me.
- MEANING3 I care about what I do in my job as school principal.
- MEANING4 The work I do as school principal is meaningful to me.

Self-determination

- SLFDET1 I have autonomy in determining how I do my job as a school principal.
- SLFDET2 As a school principal, I can decide how to go about doing my work.
- SLFDET3 I have little opportunity for independence in how I carry out my job as a school principal.
- SLFDET4 I use personal initiative in carrying out my work as a school principal.

Antecedents to *psychological empowerment* (principals)

Value of strategic information

- INFO1 I believe that goals of the school, as set out in the School Charter, are appropriate signposts to success.
- INFO2 I value information that indicates whether the goals set out in the School Charter have been attained.
- INFO3 The School Charter and Triennial Review are valuable events in the operating cycle of this school.
- INFO4 I rely on the information fed back to me during the Triennial Review process.

Role clarity

- ROLCLAR1 I feel certain about how much authority I have in my job as principal.
- ROLCLAR2 I am not sure what my responsibilities are as a principal.
- ROLCLAR3 I know what is expected of me in my role as principal.
- ROLCLAR4 The explanation given to me concerning the role of principal is clear to me.

Self-esteem

- SLFEST1 There are many things about myself I would change if I could.
- SLFEST2 Overall, things are all mixed up in my life.
- SLFEST3 I am popular with people my own age.
- SLFEST4 As a person, I am a lot of fun to be with.

Locus of control

- LOC1 Problems experienced by schools can be avoided through planning and analysis.
- LOC2 Forces beyond its control shape the competitive environment in which my school operates.
- LOC3 Becoming a successful school is a matter of creating opportunities -- luck has little or nothing to do with it.
- LOC4 It is not wise to make strategic plans far ahead because many things may turn out to be a matter of good or bad fortune.

Availability of adequate resources

- RESOURC1 When I need additional resources to do my job, I can usually get them.
- RESOURC2 I have access to the resources I need to do my job well.
- RESOURC3 I can obtain the resources necessary to support the implementation of new ideas.
- RESOURC4 Lack of resources is a barrier to proper management of my school.

Antecedents to Transformational leadership (principals)

Risk propensity

- RISK1 I undertake decision-making cautiously, seeking to minimise uncertainty.
- RISK2 I like to see decision-making that leads to dramatic changes in strategy taken in large, bold steps.
- RISK3 Decisions I make are based strictly on realistic and objective cost/benefit assessment.
- RISK4 I make decisions that are characterised by enterprising spirit that thrives on risk.

Pursuit of excellence

- EXCEL1 It is no use playing a game when you are playing with someone as good as yourself.
- EXCEL2 I get a sense of satisfaction out of being able to say I have done a good job on a project.
- EXCEL3 I find satisfaction in exceeding my previous performance even if I do not outperform others.
- EXCEL4 Part of the satisfaction in doing something comes from seeing how good the finished product looks.

Mastery

- MASTER1 If I were not good at something, I would rather keep struggling to master it than move on to something I can do easily.
- MASTER2 I would rather do something at which I feel confident and relaxed than something that is challenging and difficult.
- MASTER3 I attempt tasks that I am not sure I can do more often than tasks I know I can do.
- MASTER4 I prefer to work in situations that require a high level of skill.

Dimensions of Transformational leadership (assistant principals)

Charisma

- CHARIS1 The principal displays power and confidence.
- CHARIS2 The principal emphasises the collective mission (School Charter)
- CHARIS3 The principal arouses awareness about important issues.
- CHARIS4 The principal talks of values.

Intellectual stimulation

- INTELL1 The principal seeks different views about how the school should operate.
- INTELL2 The principal suggests new ways of doing things within the school.
- INTELL3 The principal encourages me to develop/review professional goals consistent with school goals.
- INTELL4 The principal facilitates opportunities for staff to learn from each other.

Strategic vision and articulation

- VISION1 The principal consistently generates new ideas for the future of the school.
- VISION2 The principal is inspirational, able to motivate by articulating effectively the importance of what members of the school community are doing.
- VISION3 The principal has vision, often brings up ideas about possibilities for the future.
- VISION4 The principal is entrepreneurial; seizes new opportunities in order to achieve goals.

Inspiring subordinates

- INSPIRE1 The principal has a capacity to excite people with a vision of what might be accomplished if they work together.
- INSPIRE2 The principal exhibits a capacity to get staff and students to believe they can overcome anything.
- INSPIRE3 The principal has a capacity to provide a source of inspiration for others within the school.
- INSPIRE4 The principal has a capacity to raise people to new levels of effort.

Measure of principal innovation – outcome variable

- INMGT The principal actively promotes innovation in management structures within this school.

Appendix C

Survey documents

This appendix contains copies of documents included in the survey kits distributed to Principal Class Officers of the *Victorian Department of Education, Employment and Training (DEET)*. They include letters of introduction, letters of support and survey instructions.



Victorian Association of
State Secondary Principals Inc.
Unit 2, 13 - 21 Vale St, North Melbourne, 3051
Victoria, Australia
Ph: 61 3 93268077 Fax: 61 3 93268147
e-mail: vassp@vpa.org.au
Registered No. A0032008U

The Principal

1 February, 2001

RE Research Project

I endorse the research project undertaken by Mr. Graeme Rose into the effects of management change on innovation and organisational effectiveness. Mr. Rose has contributed to state education over many years in the capacity of:

- Secondary teacher (14 years)
- School Council member (8 years)
- School Council Treasurer (3 years) and
- Contributor to VASSP Newsletter and Principal Matters (articles on accounting issues).

The research project is well grounded in theory and is likely to produce interesting and useful results for school administration in Australia, as well as internationally. The proposed model for testing is relevant not only for the improvement of management practices in schools, but also for large organisations involved in the devolution of decision-making authority in both the public and private sectors.

Please complete the survey form and return it as soon as possible.

Sincerely,

(signed) E. J. Brierley

President

VASSP

February, 2001

The Principal

Dear Sir or Madam,

RE Survey of School Principals

I am writing to request your participation in a research project examining the relationships between management style and organisation effectiveness. This project forms part of my study leading to the degree of Doctor of Philosophy under the supervision of Professor Kim Langfield-Smith of La Trobe University. We feel that Victorian state school managers are ideally suited to this investigation since the introduction of the *Schools of the Future* initiative of the Victorian Government. Your Assistant Principal is also asked to complete a separate survey that will give a more complete perspective of management in your school.

Research purposes:

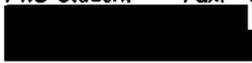
- to develop a model that explains changes in innovation in schools and effectiveness,
- to test this model using data gathered from 'real-world' practitioners and
- to improve management practices in schools.

It is a condition of both DEET (*Approval No. SOS 001284*) and the Ethics Committee of La Trobe University Faculty of Law & Management (*Approval No. 99/49*) that the information you provide will remain anonymous and confidential to all but the principal researcher and supervisor. Please assist us with this survey — the bigger the response, the more valid our conclusions.

Sincerely,



(Signed)

Graeme C. Rose Ph: 0260 519903 Professor Kim Langfield-Smith Ph: 041 705 3506
PhD Student Fax: 0260 519878 Supervisor Fax: 039 479 1654
 Professor of Accounting
La Trobe University

Encl. *Principal's Survey Form*
Reply-paid envelope
Envelope for AP (please pass on)

See over for instructions re survey return ...

March 1, 2001

The Assistant Principal

Dear Sir or Madam,

RE Survey of Assistant Principals

I am writing to request your participation in a research project examining the relationships between management style and organisation effectiveness. This project forms part of my study leading to the degree of Doctor of Philosophy under the supervision of Professor Kim Langfield-Smith of La Trobe University. We feel that Victorian state school managers are ideally suited to this investigation since the introduction of the *Schools of the Future* initiative of the Victorian Government.

Research purposes:

- to develop a model that explains changes in innovation in schools and effectiveness,
- to test this model using data gathered from 'real-world' practitioners and
- to improve management practices in schools.

It is a condition of both DEET (*Approval No. SOS 001284*) and the Ethics Committee of La Trobe University Faculty of Law & Management (*Approval No. 99/49*) that the information you provide will remain anonymous and confidential to all but the principal researcher and supervisor. Please assist us with this survey --- the bigger the response, the more valid our conclusions.

Sincerely,



Graeme C. Rose
PhD Student
Lecturer in Accounting
Charles Sturt University
EMAIL: [redacted]



Professor Kim Langfield-Smith
Supervisor
Professor of Accounting
La Trobe University
EMAIL: [redacted]
Fax: 039 479 1654

Encl. *Assistant Principal's Survey Form*
Reply-paid envelope

See over for instructions re survey return ...

LA TROBE UNIVERSITY
VICTORIA 3086 AUSTRALIA
TELEPHONE: (03) 9479 1667
FACSIMILE: (03) 9479 5971
EMAIL: business@latrobe.edu.au
WEB SITE: <http://www.business.latrobe.edu.au>

BN 61 80 76 111

Survey instructions

We thank you for your assistance with our research and urge you to complete and return your survey form as soon as possible. Please:

1. **Complete the enclosed Assistant Principal's Survey Form**
[This should take around 15 minutes.]
2. **Return to Professor Kim Langfield-Smith in enclosed reply-paid envelope**

If you would like to obtain a summary of the findings, please indicate by writing your address on the back of the reply-paid envelope. Results of our research will be published in scholarly journals in accounting, management and education, although at no stage will participating personnel or their schools be identified in any way.

We stress that your responses will remain strictly confidential and do not require your name or the name of your school to appear on the survey form. The code number on the survey form is for statistical matching purposes only and we will base our report on a summary of the aggregate data. If you have any concerns of an ethical nature that relate to this project, please contact:

The General Manager,
School Community Support Branch
Department of Education Employment and Training (DEET)
Level 2, 33 St Andrews Place
East Melbourne, Victoria 3002
Quote Approval No: **SOS 001284**

OR

The Secretary,
Faculty of Law & Management
Human Ethics Committee
La Trobe University
Bundoora, Victoria 3083
Quote Approval No: **99/49**

We appreciate your assistance with this project.

Appendix D

Demographic details

The purpose of this appendix is to provide demographic information about raters. They are principal class officers (principals and assistant principals) employed by large schools of the Victorian State *Department of Education, Employment and Training*.

A total of 621 principals from a possible total of 1051 schools returned survey forms. Since the focus of this thesis is on principals, the survey forms from schools whose principal did not respond were not included in the analysis. This accounts for the relatively large number of "missing" responses from the profiles of assistant principals.

Profiles of Principal Class Officers

Age and service profile

The following table contains data relating to raters' age and experience (in years) as teachers and principal class officers.

Table D-1 Age and service profile (years)

		<i>n</i>	Mean	Standard deviation	Minimum	Maximum
Principals (<i>n</i> = 539)	Age	533	50.2	4.8	31	64
	Years as principal	532	7.8	5.68	0.2	38
	Years as a teacher	516	29.1	6.36	1	44
Assistant Principals (<i>n</i> = 539)	Age	531	47.9	5.16	32	64
	Years as AP	536	4.9	4.12	0.3	25
	Years as a teacher	535	25.4	25.44	1	43

Teaching methods

All teachers train in an area of expertise. At the primary level, teachers receive 'generalist' training. At the secondary level, teachers train in an academic 'discipline' according to their undergraduate learning. The following table contains numbers and percentages of raters who belong to these disciplines.

Table D2 Teaching methods

Teaching methods	Principals		Assistant Principals	
	Frequency	Percent	Frequency	Percent
Arts/humanities	96	17.8	94	17.4
Mathematics/science	67	12.4	72	13.4
Information technology	3	0.6	7	1.3
Commerce/other	40	7.4	48	8.9
Humanities & mathematics	5	0.9	5	0.9
Primary teacher	299	55.5	287	53.2
Special education teacher	21	3.9	23	4.3
Missing	8	1.5	3	0.6
TOTALS	539	100.0	539	100.0

Academic qualifications

Table D-3 Raters' academic qualifications

Qualifications	Principals		Assistant Principals	
	Frequency	Percent	Frequency	Percent
Diploma	94	17.4	135	25
Bachelor	206	38.2	263	48.8
Post-graduate study	139	25.8	89	16.5
Master	89	16.5	48	8.9
Doctorate	5	0.9	3	0.6
Missing	6	1.1	1	0.2
TOTALS	539	100.0	539	100.0

Sex of raters

Table D-4 Sex of raters

Sex	Principals		Assistant Principals	
	Frequency	Percent	Frequency	Percent
Male	382	70.9	262	48.6
Female	153	28.4	274	50.8
Missing	4	0.7	3	0.6
TOTALS	539	100.0	539	100.0

Profiles of schools

The tables in this section contain information relating to the profiles of the schools represented by the principal class officers who returned survey forms.

Education level

Schools within the Department of Education, Employment and Training fall, in the main, into two categories. They are primary schools that provide education to students in the 5 years old to 12 or 13 year old age groups (pre-school to year 6). Secondary schools provide education to students in the 12 to 19 and older age groups (Year 7 to Year 12). A small number of schools provide education to the whole range of year levels; they are referred to as P-12 schools.

Table D-5 Education level provided by schools

School type	Frequency	Percent
Primary	340	63.1
Secondary	154	28.6
P-12	28	5.2
Special School	15	2.8
Missing	2	0.4
TOTALS	539	100.0

School location

Principals were asked to classify their schools as being located in either a metropolitan or rural setting. Table D-6 contains data that reveals the number and proportion of schools located in these areas. Care is needed in the interpretation of these data since the assessment of a school's location is a subjective one.

Table D-6 Location of schools by location (metropolitan/rural)

Location	Frequency	Percent
Rural	217	40.3
Metropolitan	320	59.4
Missing	2	0.4
TOTALS	539	100.0

Location (by region)

For administrative purposes, schools that operate within the Department of Education, Employment and Training belong to one of nine regions across the State of Victoria. These regions are distinguished geographically.

Table D-7 Location of schools by location (by region)

Region	Sample Frequency	Sample Percentage	Region population	Percentage of population in sample
Barwon/South-West	52	9.6	95	61.1
Central Highlands Wimmera	31	5.8	48	68.8
Eastern Metropolitan	96	17.8	200	56.5
Gippsland	38	7.1	64	70.3
Goulburn North-Eastern	50	9.3	73	79.5
Loddon Campaspe Mallee	45	8.3	77	63.6
Northern Metropolitan	69	12.8	156	53.2
Southern Metropolitan	97	18.0	211	54.5
Western Metropolitan	59	10.9	127	52.8
Missing	2	0.4	n/a	n/a
TOTALS	539	100.0	1051	51.3

Measures of size

Table D-8 contains statistics related to the size of schools whose principals returned survey forms. Data contained in this table should be treated with caution since a number of respondents did not provide this information. In other cases principals provided estimates only as it is difficult to identify the quantum of size at any one time with accuracy.

Table D-8 Number of students, global budget and number of teachers

Description	n	Min.	Max.	Mean	Standard Deviation
Number of students	533	22	1,832	451.64	322.01
Global Budget	476	\$1m	\$13m	\$m2.98	\$m9.73
Number of teachers	514	1	130	30.58	22.96

Appendix E

Covariance/variance and correlation matrices

This appendix contains covariance matrices produced by Lisrel 8.54 (Jöreskog, K. G. *et al.* 2003). These matrices facilitate the development and testing of models by the reader.

Table E-1 Dimensions of Psychological Empowerment

		1	2	3	4	5	6	7	8	9
COMP1	1	0.616								
COMP2	2	0.403	0.674							
COMP3	3	0.551	0.442	0.915						
IMPACT1	4	0.255	0.207	0.281	0.608					
IMPACT3	5	0.291	0.251	0.307	0.321	0.607				
IMPACT4	6	0.206	0.181	0.191	0.334	0.296	0.557			
SLFDET1	7	0.226	0.261	0.241	0.222	0.386	0.246	1.831		
SLFDET2	8	0.252	0.254	0.301	0.216	0.321	0.223	0.916	1.429	
SLFDET3	9	0.203	0.228	0.218	0.221	0.267	0.189	0.947	0.586	1.562

Table E-2 Dimensions of Transformational Leadership

		1	2	3	4	5	6	7	8	9	10
CHARISMA1	1	1.408									
CHARISMA2	2	0.655	1.588								
CHARISMA3	3	0.628	0.832	1.164							
CHARISMA4	4	0.669	1.037	0.836	1.577						
INSPIRE2	5	0.849	1.012	1.902	1.156	1.762					
INSPIRE3	6	0.769	0.9949	1.024	1.098	1.251	1.859				
INSPIRE4	7	0.816	0.949	0.923	1.037	1.377	1.287	1.678			
VISION1	8	0.746	0.985	0.967	0.960	1.034	1.127	1.085	1.626		
VISION3	9	0.823	1.030	0.989	1.084	1.208	1.308	1.227	1.359	1.776	
VISION4	10	0.791	0.887	0.818	0.902	1.095	1.032	1.113	1.172	1.279	1.654

Antecedents to Psychological empowerment

Table E-3 Access to strategic information

	1	2	3	4	
INFO1	1	1.437			
INFO2	2	0.797	1.219		
INFO3	3	1.037	0.967	1.933	
INFO4	4	0.861	0.757	1.128	2.247

Table E-4 Availability of resources

	1	2	3	
RES1	1	2.381		
RES2	2	1.460	2.617	
RES3	3	1.405	1.337	2.263

Table E-5 Role clarity

	1	2	3	4	
ROLCLAR1	1	1.481			
ROLCLAR2	2	0.443	1.152		
ROLCLAR3	3	0.476	0.429	0.792	
ROLCLAR4	4	0.518	0.554	0.487	1.881

Table E-6 Structural model

	1	2	3	4	5	6	7	8	9	10	
COMPET	1	0.555									
IMPACT	2	0.241	0.408								
SLFDET	3	0.243	0.255	1.080							
CHARISMA	4	0.064	0.068	0.102	0.941						
INSPIRE	5	0.051	0.067	0.156	0.957	1.459					
VISION	6	0.074	0.064	0.134	0.915	1.136	1.407				
INMGY	7	0.081	0.060	0.110	0.883	1.069	1.119	1.904			
INFO	8	0.093	0.080	0.147	0.071	0.020	0.032	0.061	1.121		
RESOURCE	9	0.263	0.200	0.655	0.015	0.100	0.106	0.013	0.282	1.741	
ROLCLAR	10	0.318	0.233	0.415	0.063	0.055	0.046	0.090	0.241	0.436	0.695

Table E-7 Pearson correlation matrix of key variables

	1	2	3	4	5	6	7	8	9	10	
Information	1	1.000									
Resources	2	.202**	1.000								
Significance (2-tailed)		0.000									
Role clarity	3	.273**	.396**	1.000							
Significance (2-tailed)		0.000	0.000								
Competence	4	.117**	.268**	.512**	1.000						
Significance (2-tailed)		0.006	0.000	0.000							
Impact	5	.119**	.237**	.437**	.507**	1.000					
Significance (2-tailed)		0.006	0.000	0.000	0.000						
Self determination	6	.134**	.478**	.479**	.313**	.383**	1.000				
Significance (2-tailed)		0.002	0.000	0.000	0.000	0.000					
Inspiration	7	0.014	0.061	0.058	0.062	.094*	.130**	1.000			
Significance (2-tailed)		0.752	0.156	0.178	0.152	0.028	0.002				
Intelligence	8	0.024	0.016	0.058	0.052	0.077	.093*	.826**	1.000		
Significance (2-tailed)		0.572	0.719	0.182	0.230	0.075	0.030	0.000			
Vision	9	0.021	0.066	0.049	0.072	.091*	.118**	.876**	.822**	1.000	
Significance (2-tailed)		0.620	0.126	0.257	0.095	0.035	0.006	0.000	0.000		
INMGY	10	0.041	0.007	0.078	0.079	0.068	0.076	.655**	.708**	.692**	1.000
Significance (2-tailed)		0.337	0.871	0.069	0.067	0.114	0.076	0.000	0.000	0.000	

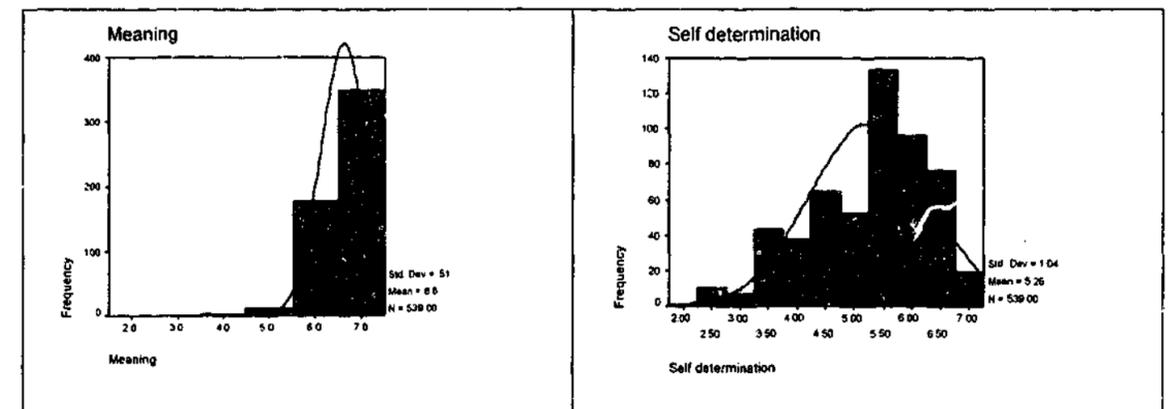
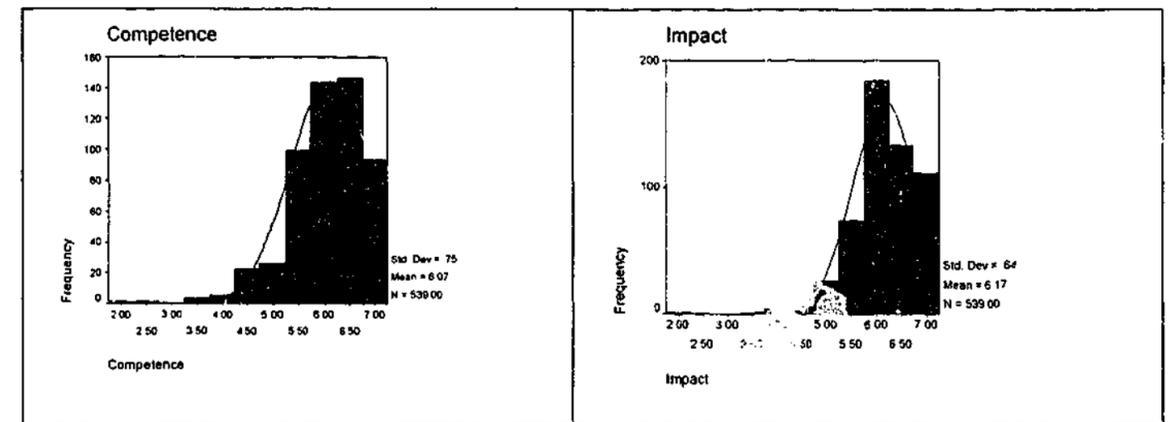
* significant to the 0.01 level ** significant to the 0.001 level

Appendix F

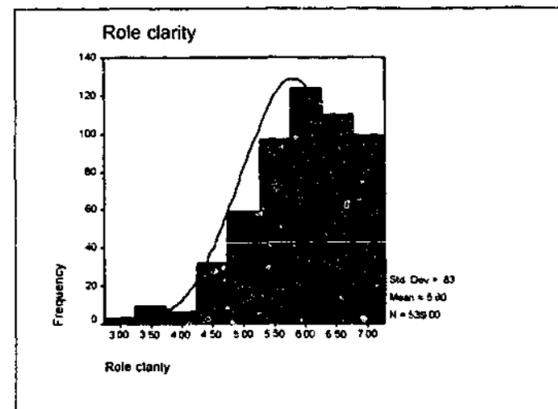
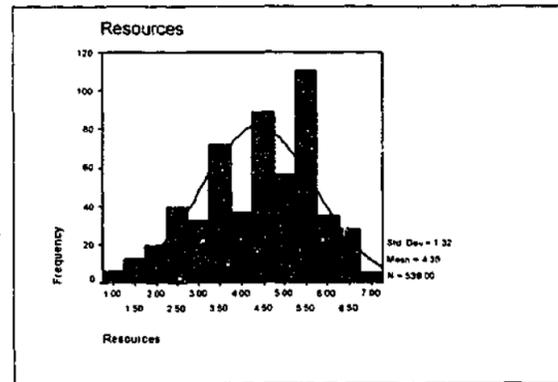
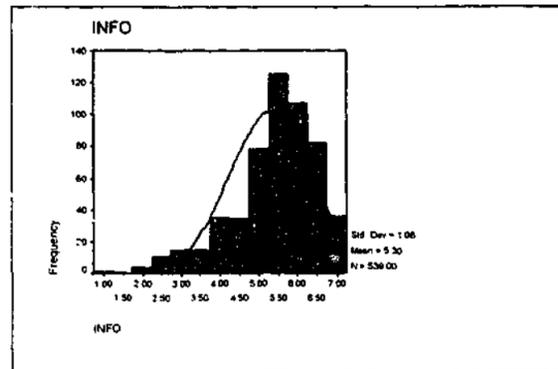
Histograms of multivariate items

This Appendix contains histograms that reveal the shape of the distribution of the multivariate items used in empirical analysis in the thesis.

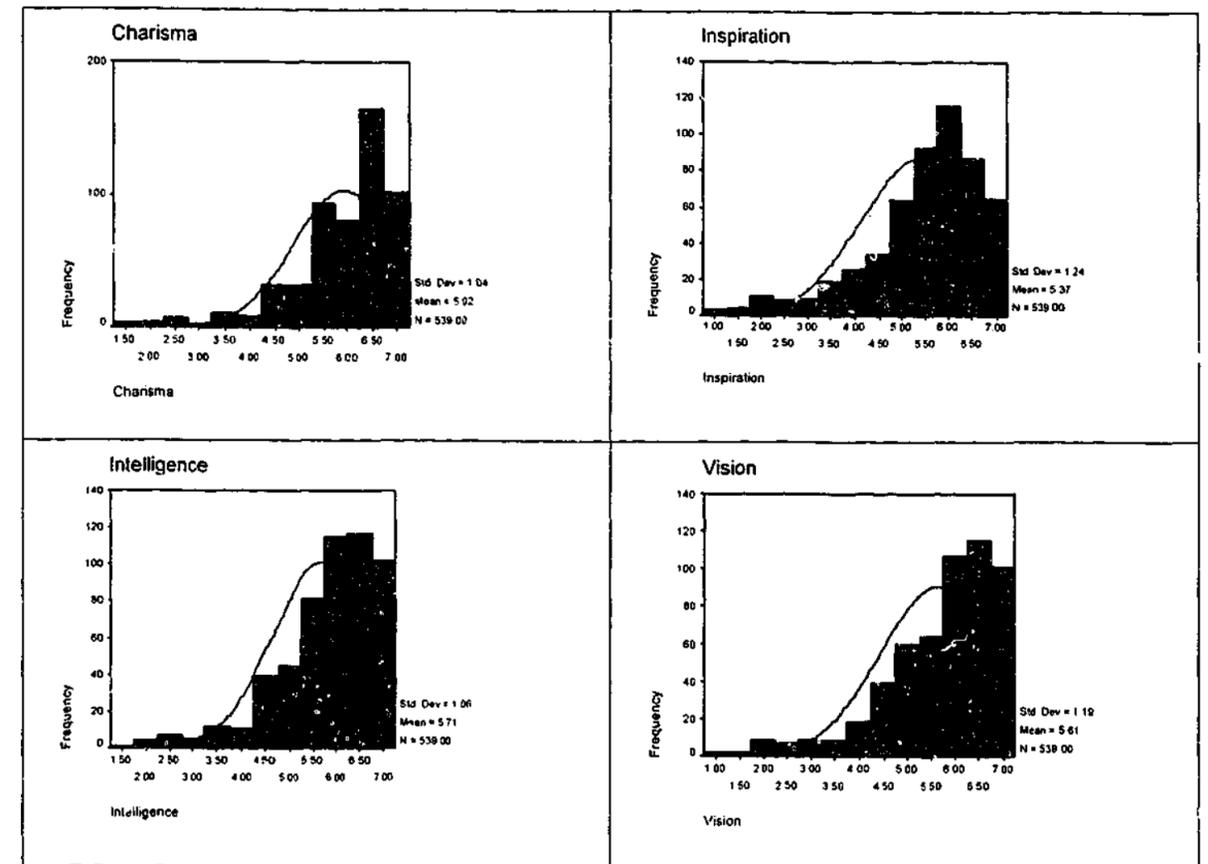
Dimensions of *psychological empowerment*



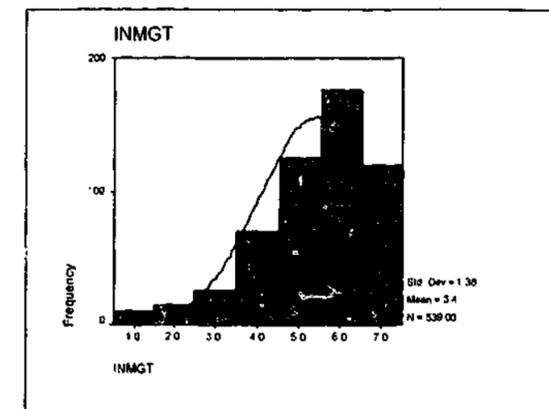
Antecedents to psychological empowerment



Dimensions of transformational leadership



Outcome variable – innovation in management structure



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NAME: Graeme C. Rose

THESIS TITLE: Investigating the role of state school principal' feelings of empowerment affecting transformational leadership in effective school governance: Empirical testing of a structural model

Typographical errors

ERRATA

- p. 45 last paragraph Change to 1.5 spacing (from single spacing).
- p. 161 Table 6-13 Delete the upper bold line from the right-hand side.
- p. 208 Insert a blank line after paragraph two.
- p. 220 Insert a blank line after paragraph three.

Amendments

ADDENDUM

- p. xvii Add the following sentence to the end of paragraph 4:
"Thanks to Professor Eddie Oczkowski of Charles Sturt University and Dr. George Tanewski of Monash University for assistance with empirical analysis."
- p. 3 paragraph 1: Delete second sentence beginning "This aim provided ...".
- p. 3 paragraph 2: Delete last sentence beginning "Both issues have implications ...".
- p. 4 paragraph 1 Delete second "Rappaport" within parentheses.
- p. 4 paragraph 3 Delete "Section 1.2," in second sentence.
- p. 4 paragraph 3 Replace comma following "are presented" with a full stop. The following sentence then reads: "Section 1.6 contains a number of limitations of scope and key assumptions."
- p. 5 paragraph 1 Delete last sentence of the paragraph beginning "Whatever the motivation ...".
- p. 8 Figure 1-1 Change "Locus of control" to "Internal locus of control".
- p. 52 paragraph 2 Delete paragraph. That is, "Psychological empowerment is considered ... to "... orientation to his or her work role (Spreitzer 1995a)."
- p. 53 paragraph 3 Delete first sentence beginning, "A model, suitable for empirical testing ..."

- p. 54 paragraph 1 In the first sentence, change "six" to "five".
- p. 55 Figure 3-2 Change "Locus of control" to "Internal locus of control".
- p. 55 paragraph 3 In the first sentence, change "five" to "four".
- p. 60 paragraph 2 In the last sentence, change "six" to "five".
- p. 61 Figure 3-4 Change "Locus of control" to "Internal locus of control".
- p. 129 Table 5-1 Under "Comments" column, change "... an hypothesised model." to "... and hypothesised model".
- p. 140 Section 5.4.3 In the second sentence, change "Hair" to "Hair *et al.*".
- p. 141 paragraph 3 In the second sentence, change "Hair" to "Hair *et al.*".
- p. 170 Table 6-16 Change heading "Vision" to "Strategic vision and articulation".
- p. 170 Table 6-16 Change heading "Inspiration" to "Inspiring subordinates".
- p. 170 Table 6-16 Change heading "Information" to "Value of strategic information".
- p. 170 Table 6-16 Change heading "Resources" to "Availability of resources".
- p. 170 Table 6-16 Change heading "INMGT" to "Innovation in management structure".
- p. 203 Figure 8-2 Change "Locus of control" to "Internal locus of control".

- p. XXXIII The reference to Hair, J. F. *et al.* (1998) should be changed to read as follows:

Hair, J. F., Anderson, R. E., Tatham, R. L. & Black, W. C. 1998, *Multivariate data analysis*, Prentice-Hall International Inc., New Jersey.

- p. XLVII The reference to Mayston, D. (1993) should be changed to read as follows:

Mayston, D. 1993, 'Principals, agents and the economics of accountability in the new public sector', *Accounting, Auditing & Accountability Journal*, 6(3), pp. 68-96.