MANAGERIAL DECISION MAKING PROCESSES AND AFFECTIVE OUTCOMES AS A FUNCTION OF INDIVIDUAL FACTORS AND SELF-EFFICACY BELIEFS

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ABSTRACT

Making decisions in the business environment is arguably the most challenging aspect of managers’ yet also the easiest to fail in. Unlike individual decisions managers as agents for their organizations make decisions amidst high levels of ambiguity, incomplete information and mostly under time pressure. These are the very conditions that make managers vulnerable to the volition-undermining potential of decision-generated affect precisely when they are feeling over-extended to deal with such demands. Effective managerial decision making (MDM) involves more than applying a set of individual abilities. Managers face numerous obstacles, failures, and setbacks that often carry perturbing self-evaluative implications as well as social consequences that undermine their self-evaluations in ways that impair good use of their decision making skills (Bandura, 1997).

Given the absence of a coherent theoretical framework in the literature the conceptual model of relations put forward attempts to organize and simplify how managers make decisions as agents of their organizations. Most conceptualizations apply oversimplified models that focus attention on one or a few variables, neglect the joint constellations of individual variable factors and the influence of individual self-generated influences as a contributing factor in MDM. As an ex post facto explanatory-predictive study the present research offers evidence of these links among the theoretically relevant constructs in order to formulate an account of their relations in a parsimonious framework that could guide future insights to explain and predict the intentions and direction of managerial decision behaviour.

Conceptual research has outpaced empirical research in decision making of managers in organizations. A number of mini-theories exists that focus on a few variables using linear, antecedent-consequence relations with manipulations in laboratory environments that deal with decisions in contexts that are very different to those faced by managers. There is limited research on managers as research participants and empirical findings based on non-managerial samples and students may not generalize to managers in real life decision making. The present research used a non-probability, purposive sample \((N = 196)\) of experienced managers in the Western Cape region of South Africa, all employed in private and public organizations (mean age 38.9 years, \(SD \) of 7.49, ethnic black managers constituted 15.8% of the sample).
As part of the study it was necessary to construct and validate custom indicator measures in an independent pilot study from the same population. The pilot study determined the factor structures of the dimensionality and internal consistency of the custom-designed measures by way of both convergent, as well as, discriminative validity. The exploratory factor (EFA) and internal reliability analyses succeeded to provide both a comprehensive and empirical grasp on the constructs as was defined. Further, analyses of both standardized and custom-designed also revealed no significant difference between black and other managers across the pilot samples which provided confidence of the substantive relations of interest (i.e., the associations among the variables).

Structural equation modeling (SEM) was chosen as the data analysis strategy of choice and a confirmatory factor analysis (CFA) demonstrated that the operational measures by and large succeeded in providing both a comprehensive and empirical grasp on the constructs as defined. The inter-construct relations were also consistent with expectations. Evidence for convergent validity however proved that the indicator measures for the allocation of attentional resources were less than adequate in order to provide an uncontaminated measure as a latent variable.

The structural model was subjected to further scrutiny by way of a spectrum of goodness-of-fit statistics. The analyses revealed that the model was not adequate and the null hypothesis that the model fitted the population data was subsequently, rejected. It was also sensible to assess the degree of lack of fit of the model with reference to RMSEA which revealed a value of .08, that suggested a reasonable model fit. The poor structural model fit could however be attributed to the failure of the measured indicators used to provide an acceptable grasp of the allocation of attentional resources as a latent variable. The inherent structural flaws in the model could however not be unequivocally be ruled out as an additional possibility of poor fit. One conclusion is the possibility of an expanded model that requires additional indicator measures and additional paths. Notwithstanding these limitations, the present research provided support for social cognitive theory that underlies the model. In accordance with the literature and empirical findings the present research demonstrated managers’ decision making is much more than reason-based behaviour.

The present research demonstrates the interdependencies and cumulative effects among individual factors, self-efficacy beliefs and temporal volitional processes, as psychological
mechanisms through which social-structural factors are linked to the quality of MDM processes. The present research also presents an argument for the independent contributions of self-efficacy beliefs as causal influences on ‘hot temporal processes’ that promote accuracy in decision making. Although present research demonstrates that the estimates were greater for cognitive ability than for both self-efficacy beliefs and social self-confidence it does not suggest that personality traits and self-efficacy beliefs have no utility. The present research demonstrates that cognitive ability combines with personality traits, self-efficacy beliefs and temporal processes (decision-generated affect and the allocation of attentional resources) in a complex manner through multiple pathways.

Key Words: Self-efficacy beliefs, managerial decision making, decision-generated affect, attentional resources
ACKNOWLEDGEMENTS

This theoretical and empirical journey was akin to a complex highway turned into a marathon. Other than conducting this research in solitude and experiencing a lack of community, working through endless iterations of chapters and analyses indeed created a fertile breeding ground for the emergence of loss of momentum and persistence. I clearly identified with William James’ (1842-1910) comment that nothing is so fatiguing as the eternal hanging on of an uncompleted task.

I owe a debt of gratitude to many people for their hand in helping this research come to life. I thank Prof. Mark Watson for his patience in guiding me with the difficult task to present this thesis in a logical and coherent manner and Prof. Cheryl Foxcroft for her creative conceptual perspectives. I benefited greatly from their insightful views and enlightening work sessions as scientists and scholars. I also thank Prof. Callie Theron at the University of Stellenbosch for his advice and intelligent critiques that helped me sharpen and acquire the skills needed in statistical analysis and techniques.

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DECLARATION

I, the undersigned, hereby declare that the work contained in this dissertation is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

Signature: _____________________

Date: 24 March 2010
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CHAPTER ONE

CONTEXT OF THE RESEARCH PROBLEM

The burden of decision making is vividly depicted in movies, magazines, novels, great victories and tragedies. Hamlet’s dilemma was not about what decisions he should take, but rather whether he would be able to make any decision at all. Dante was paralysed by indecision and starved to death when confronted with two equally appealing foods. Napoleon lost his army and empire in his ill-fated Russian campaign of 1812, despite being informed that the chances of failure were high.

In her book *The Challenger Launch Decision: Risky Technology, Culture, and Deviance at NASA*, Diane Vaughan (1996) illustrates how deviance from the norm became institutionalized to result in an incremental descent into poor decision making which led of the ill-fated Challenger launch disaster. Brigadier General Matthew Broderick, chief of the Homeland Security Operations Centre, who was responsible for alerting President Bush and other senior government officials of Hurricane Katrina went home despite multiple reports of the imminent disaster. Virtually everyone in the USA’s Bush administration believed in the existence of weapons of mass destruction in Iraq despite a complete lack of confirming evidence. The decision to go to war in Iraq was tipped by anger for some people and by fear for others. Evidence also shows that corporate acquisitions are often financially harmful for the shareholders of acquiring firms (Malmendier & Tate, 2002). The 2008 global financial crises visibly underscores how beliefs in exercising control over events that are uncontrollable tend to make decision makers take undue risk, which increase the possibility of financial losses (Collins, 2009).

Many decision failures emanate from intelligent, responsible managers and executives with the best information and intentions; yet they make decisions that are clearly wrong. It is disconcerting that as flawed human beings, managers reside in positions to decide the fate of their organizations where injudicious commitment associated with their humanness are enormous. The daunting reality is that important decisions made by intelligent, responsible people with the best information and intentions are sometimes hopelessly flawed (Campbell, Whitehead & Finkelstein, 2009).
The next subsection reviews major historical paradigms in decision theory as a general framework of decision behaviour. Rational theories of choice are shown to be an inadequate paradigm to either describe how individuals make decisions or to evaluate the quality of their decisions. This is followed by an overview of descriptive and behavioural process-models of decision making.

**History of Decision Theory**

Over the past several decades, researchers investigating the psychology of decision making have offered counterintuitive findings, profound insights, and practical prescriptions regarding the means by which individuals make decisions. Understanding how people make decisions is however spread across many disciplines. The decision making paradigm, as it has developed, is the product of a marriage between cognitive psychology and economics. The unique association of decision theory with economics has resulted in the problem of decision making behaviour being approached from normative principles of rationality (see, for example, Koehler & Harvey, 2007; Pham, 2007). The assumption derived from this premise is that individuals are inherently rational and all have the same goal: to maximize expected utility (Schneider & Barnes, 2003). With this resultant emphasis on cognition and rationality, theories of decision making assume that individuals will conform to normative standards once they are informed about them. In fact, Shafir and LeBoeuf (2002, p. 492) note that; “the rationality assumption has come to constitute perhaps the most common and pivotal assumption underlying theoretical accounts of human behavior in various disciplines.”

From economics, decision theory inherited, or was socialized into, the language of utility maximization that provides a unitary perspective for understanding all behaviour. From cognitive psychology, decision theory inherited its descriptive focus, concern with process, and many specific theoretical insights. Koehler and Harvey (2007) however note that the focus on economics may have led decision research to underutilize the insights and methods of psychology (Weber & Johnson, 2009).

Despite the dominant stronghold of rationality, the history of decision making has not marched steadily toward rationalism (Buchanan & O'Connell, 2006; Certo, Connelly, & Tihanyi, 2008; Hirshleifer & Shumway, 2003; Kisfalvi & Pitcher, 2003; Wong, Kwong, & Ng, 2008). There has been a growing concern that the progress of decision making research may be
limited by focusing heavily on traditional schools of thought (e.g., approaches emphasizing deviations from rationality and utility theory). At the same time, there has been accumulating evidence to show that numerous unexplored factors are likely to impact judgment and choice (see, for instance, Schneider & Shanteau, 2003).

In real life situations, individuals perform poorly because they make do with only good-enough decisions (e.g., Buchanan & O'Connell, 2006; Schmidt & Calantone, 2002). Such deviations from the criteria of rational judgment and choice “can be attributed to nonsystematic performance errors ” (Stanovich & West, 1998, p. 164) and these deviations are far too systematic, both within and across individuals, to be considered randomly distributed (Shafir & LeBoeuf, 2002; Stanovich & West, 2000).

Incremental adjustments to economic models, in their accumulation over the past 50 years, have added up to and converge on a more psychological theory of decision making. The recognition of these systematic irrationalities in decision making has emphasized the need to supplement normative principles of rationality in decision making with descriptive findings that delineate the systematic ways in which decision makers deviate from rationality (e.g., Bazerman, Curhan, Moore, & Valley, 2000; Elbanna & Child, 2007; Hough & White, 2003; Papadakis, 2006; Wong, Kwong, & Ng, 2008). There has been a growing interest in a descriptive perspective in decision making that attempts to clarify the reasons why individuals are often not disposed to or are incapable of conforming to normative theories. The dominant feature of descriptive theories is that individuals rely on simplifying strategies or cognitive heuristics in their decision making (e.g., Chen & Sun, 2003; Hodgkinson & Healey, 2008; Payne, & Bettman, 2007). Although the traditional influences of philosophy, economics, and mathematics are evident, psychology is clearly playing a greater role in decision making theory (e.g., Beach & Connolly, 2005; Forgas, Kipling, & Laham, 2004; Luce, Payne & Bettman, 2001). The field is becoming more behavioural-descriptive and more psychological in its approach. In fact, Weber and Johnson (2009) stated that the adjustments to economic models over the past 50 years have converged on a more psychological theory of decision making.

The next subsection introduces decision making as a psychological process.
Decision-Making is a Psychological Process

Decision making is a volitional and reflective choice in response to perceived needs (Kleindorfer, Kunreuther, & Schoemaker, 1993). Individuals make decisions to satisfy goals that are far richer than what can be captured in utility-maximizing models (Schneider & Barnes, 2003) and understanding psychological process frameworks provide for a possibly better causal understanding of decision making and choice phenomena (Weber & Johnson, 2009). It is often difficult to pinpoint how process affects the outcomes of complex decisions. John F. Kennedy remarked that the essence of ultimate decisions remains impenetrable to the observer and often to the decider himself (Sorensen, 1963). Good decisions result from sound process: “in man as much as in organisations, everything is a matter of decision processes and problem solving” (Simon, 1945, p. 38).

In this regard, Chia (1994) points out that the attempts to replace decision by other terms, for example, action and change, ignore the ontological status of the decision making process. He argues that a decision is better understood as a series of interlocking pre-definitive acts of punctuating the flow of human experiences in order to facilitate sense-making. This means that one should study the behaviour in decision making processing, rather than the processes of decision making. Final outcomes do not just depend on the inputs. To use an analogy, in cooking it is not sufficient to have all the right ingredients (inputs) and just mix them in a bowl to produce an edible cake. The order of operations matters (add mix, break eggs, then stir, etc.) and feedback over time is important (via the ubiquitous teaspoon or finger). No matter how superb the ingredients, without a sound process, few of the cakes will come out right (Kleindorfer et al., 1993).

A process focus means being especially sensitive to timing, sequence, and dynamics that account for the stream of behaviour that integrates context, multiple goals, and individual variables in the service of goals. Understanding of the decision process is useful because it considers a series of psychological processes and intermediate states that precede decisions, make predictions of the temporal order of these states and, consequently, contain more variables and multiple constraints (Weber & Johnson, 2009). Such a process framework aids decision making research with an implicit or explicit concern with the ways in which decisions might be improved with practical and applied settings in mind.
Context of the Research Problem

In the midst of the last century Chester Barnard imported the term "decision making" from the lexicon of public administration into the business world. The introduction of this phrase changed how managers thought about what they did and spurred a new crispness of action and desire for conclusiveness (Buchanan & O'Connell, 2006). Barnard and others (Kotter, March, Mintzberg, and Simon) laid the foundation for the study of managerial decision making (MDM). An explicit commitment to devote resources to a course of action over a period of time makes decision making not just an incidental part, but a critical aspect of management work. Drucker (2004, p. 61) writes, “making good decisions is a crucial skill at every level” that significantly shapes much of what occurs in organisations (Mintzberg, 1973; Zaccaro, 2001). In fact, Buchanan and O’Connell (2006, p. 33) state that "decision making implies the end of deliberation and the beginning of action”. Decision making is arguably the most important job of a manager and one of the easiest to get wrong (Garvin & Roberto, 2001) and is thus a key aspect of organizational life and a critical prerequisite for organizational success (Forgas & George, 2001).

Managers however make decisions in a context very different from individual decision making or as studied in laboratory experiments. Environmental uncertainty and hostility, industry characteristics and competitiveness, company performance and national culture represent external factors that impact on MDM (e.g., Elbanna & Child, 2007; Papadakis 2006). Managers have to meet long-term outcomes using ambiguous means-ends pathways and deal with implicit or explicit conflicts between their own and organizational goals. Even when managers make individual decisions, they often face social pressure to justify their decisions to multiple interest groups that pursue local and own goals rather than organizational goals, and yet also bear personal responsibility for the consequences of their decisions and actions. The institutional and social contexts surrounding MDM, consequently, pose unique challenges to a manager as an agent for decision making of their organization. This requires them to use a comprehensive decision process which calls for the application of cognitive abilities, as well as a blend of direct and covert social persuasion in order to balance a myriad of social and political expectations and divergent interests in a manner that promotes accuracy in decisions that serve the interests of the organization.
Motivation for the Study

All research may be considered in terms of two objectives: the quest for fundamental understanding and considerations of practical use (Stokes, 1997). Although academic psychology has flourished in generating and eliminating alternative hypotheses and isolating causation with its mastery of the hypothesis–experiment model of science, the discovery of functional relations that apply to the real world and have generality are as important. Such findings have been the basis for theoretical advances in other natural sciences (Rozin, 2009).

Observations by the researcher as a private practitioner in a managerial assessment practice and a review of relevant research suggest that MDM does not only depend on experience, the level of cognitive ability, complexity and environmental uncertainties surrounding a decision, but also on self-efficacy beliefs. The literature and empirical generalizations suggest that demographic attributes, cognitive and social abilities, as predictors of actual decision making ability should be tempered by considerable caution because they may be confounded with interacting, self-regulatory, affective and volitional-undermining factors. Managers may thus often fail to perform optimally in MDM even though they possess the requisite skills and experienced managers with the same set of abilities and traits may perform at a mediocre, adequate or a notable level, depending on fluctuations in the nature and strength of these non-ability contributors (Bandura, 1997).

Authoritative viewpoints and a search for a plausible explanation of how the constellations or potential associations of individual variable factors and self-beliefs in efficacy combine in a time-ordered structure in MDM revealed an absence of a coherent conceptualization as well as no extant research on managers as research participants. In addition, in spite of the centrality of self-beliefs in efficacy in general work performance there has been surprisingly few efforts to determine the unique or incremental validity of self-efficacy beliefs in MDM. Further, although a number of conceptualizations of decision making are present, these conceptualizations apply oversimplified models. Most models focus attention on one or a few variables in single trial, controlled and laboratory environments. Absent from these conceptualizations, however, is the influence of individual self-generated influences as a contributing factor since relatively little attention is paid to motivation and volitional processes that account for individual differences in decision making. These models are also designed to deal with decisions in contexts that are very different to those faced by managers. Although
these models reflect some commonality with managers as agents of decision making in organizations they remain ambiguous on how to improve decision making of managers.

The present study is envisaged to have a heuristic, applied and theoretical utility to address the concerns which Cascio and Aguinis (2008, p. 1074) voice:

Although there will always be a need for basic research that addresses important questions that may not be relevant to practitioners immediately…or research that is stimulated by the simple desire to understand the psychology of people at work…it will not produce a substantial body of research that will inform HR practitioners, senior managers, or outside stakeholders…If the published research is seen as relevant and useful, then there is a higher likelihood that practitioners will read it and that the research findings will affect their practices.

The motivation for this research is the development of a parsimonious model of relations of MDM in order to organize, simplify and explain how managers make decisions in organizations. The present research permits the isolation of the temporal influences, interdependencies and cumulative effects among individual factors, self-efficacy beliefs and temporal volitional processes, as psychological mechanisms through which social-structural factors are linked to the quality of MDM processes. The present researcher argues that such an integrative model indeed meets current gaps in the knowledge of MDM and that a coherent theoretical framework is envisaged to have both heuristic and applied utility.

In an age where managers face greater demands for greater accountability for their decisions, this study can make a timely contribution to a fuller understanding of MDM. The work of managers is becoming more global and requires them to adjust to greater challenges. Findings can be used for the assessments of better performing managers. Further, the ability to regulate behaviour and attention represents a set of abilities that is relatively untapped. As self-efficacy beliefs is configurally equivalent across countries (Sadri, 1996; Scholz, Dona, Sud, & Schwarzer, 2002; Schwarzer, 2002) they can provide confidence to use them as universal and relevant to MDM. Moreover, measures of self-efficacy beliefs can help practitioners predict pretraining motivation, tailor specific coaching or training programmes in order to help managers to manage their affect and subsequent temporal processes that impact on the quality of MDM.
In the next subsection the research aim is outlined.

**Research Aims**

The central thesis in this research argues that managers make decisions in the service of both individual and organizational goals. Based on *a priori* selection, determining conditions and ordering of the theoretically relevant constructs, the present researcher proposes a structural model of relations in which distal individual variables and self-efficacy beliefs combine to mediate temporal processes (indexed by decision-generated affect and the allocation of attentional resources) that predict the quality of MDM processes. In this model MDM is impacted by a causal chain of variables that take time to exert their influence to impact on the quality of decision processes. The overall aim is to establish the postulated ordering of a causal path linking individual variables (distal influences), self-efficacy beliefs (as proximal influences) and temporal processes as a whole, which bear on the construct of MDM.

An additional aim of the present research is the question concerning the relative contribution of self-beliefs in efficacy, cognitive ability and personality traits as predictors of the quality of MDM processes. Also, given the centrality of self-beliefs in efficacy in the literature, the present researcher aims to determine the unique or incremental validity of self-beliefs in efficacy in MDM.

**Chapter Outline of the Research**

Mouton (2001) lists four concepts as the logic of research viz.: (1) the research problem, (2) the research design, (3) evidence, and (4) conclusions. The conceptual underpinnings, theoretical rationale of the theoretically relevant constructs in MDM are presented in Chapter Two. Authoritative viewpoints of researchers are used to provide for a reasoned assertion to put forward an integrative model of relations as a plausible explanation of how individual variable factors and self-efficacy beliefs account for the quality of MDM processes. Chapter Three presents an empirical review of previous research findings. These empirical generalizations afford the present researcher an opportunity to select and extract empirical links in order to support the plausible constellations and associations of individual variables and self-
efficacy beliefs, together with their time-ordered influences, and their cumulative effects they bring to bear on the prediction of decision-generated affect, volitional allocation of attentional resources and subsequent quality of decision processes.

In Chapter Four the research question is formulated in terms of whether the hypothesized model provides a plausible explanation for the decision making behaviour of managers. Chapter Five is dedicated to the operationalization and psychometric evaluation of measures pertaining to the study. The chapter presents information on existing, standardized measures used. The present research furthermore required the development, design and psychometric evaluation of custom measures in an independent pilot study from the same population. The external construct validity by way of both convergent, as well as, discriminative validity of measures is also presented. Finally, univariate normality of the measures is outlined and presented.

Chapter Six outlines the primary aim, the research questions and the methodological evidence in support of the aim. The present research is an ex post facto explanatory-predictive research study. The chapter outlines the sampling design, the procedures followed, the ethical considerations implemented and the data analysis and data techniques. The choice of data analysis techniques is based on the research question posed by the present study. A two stage analytic procedure is presented. First, a measurement model is presented to test the validity of the measures using confirmatory factor analysis (CFA) procedures. Other than testing the validity of the measures, the second stage of the analytic procedure presents evidence to reveal whether the theoretical model and thus the research hypotheses, are supported. Structural equation modeling (SEM) was adopted as the data analysis strategy of choice in order to evaluate the entire system of direct and mediated relations in the model instead of just the contribution of isolated variables. Finally, a description of the variables, and substantive and statistical hypotheses are presented.

The results are presented in Chapter Seven. The evaluation of the measurement part of the model precedes the detailed evaluation of the structural part of the model. CFA results are presented first as a test of the validity of the indicator variables. The findings on multivariate normality are followed by the results of the goodness-of-fit for the measurement model and specific evidence of construct validity. Moreover, this evaluation also provides reliability data and independence of the variables in the proposed model. This is followed by the results of the
statistical analyses as evidence in order to compare how well the proposed model fits the data and, in doing so, evaluate the plausibility of the proposed model. This is followed by the results of the substantive linkages between the various individual variables and self-efficacy beliefs in order to determine their incremental contribution to the quality of MDM processes.

Chapter Eight presents a discussion that derives from the results obtained from the present research. This is done by connecting the results with the original aims as well as the theory and research used to support the arguments of the present research.

Chapter Nine discusses the theoretical and practical contributions of the present research as well as practical prescriptions that would aid practitioners and managers in decision making. The research’s methodological limitations are noted and recommendations for future research are presented to answer questions about the principal relationships with regard to the theory as well as to provide insight into alternative formulations of the model that could be supported.

Chapter Two and Three that follow form the theoretical unit that provides the conceptual framework of the theoretically relevant constructs and conceptual relations in MDM based on social cognitive theory.
CHAPTER TWO
CONCEPTUAL AND THEORETICAL FRAMEWORK

Understanding how individuals make decisions is an enterprise of such importance that its study is spread across many disciplines with most judgment and decision making research conducted outside psychology (Koehler & Harvey, 2007). The study of decision making is thus interdisciplinary, employing concepts and models from anthropology, economics, political science, sociology, psychology and statistics (Payne, 1997). Consequently, the theory on decision making is vast, ill bound, heterogeneous and somewhat disorganized (Buchanan & O'Connell, 2006; Connolly & Ordonez, 2003). This lack of integration in the decision making literature has slowed theoretical progress (Dougherty, Gronlund, & Gettys, 2003).

Certo et al. (2008) noted that summarizing what is known about decision making is a daunting challenge, indeed a view shared by the researcher. Decision making is differentially understood across the variety of disciplines that make up decision theory and the fundamental obstacle the present researcher faced in this study is the absence of a coherent and adequate theoretical framework in which to organize and simplify the relevant constructs in order to describe managerial decision making (MDM) in a parsimonious manner. Clearly defined constructs are the building blocks of good theory (Klein & Zedeck, 2004) but in decision making there is no clear universal agreement on the definitions and constructs of decision making (Yates, Veinott, & Patalano, 2003). In addition, the need for practical knowledge about decision making has resulted in a number of specific theories that focus on particular aspects of decision making. Although there is a reasonable commonality within MDM, these models describe different kinds of decisions in contexts that are very different to those faced by managers (Beach & Connolly, 2005; Leaptrott & McDonald, 2008). Given the current status of decision making theory it was deemed wise to structure the chapter in the following three sections: (1) a theoretical overview of MDM, (2) relevant constructs in MDM, and (3) a formulation of a theoretical framework for MDM.

The first section of this chapter provides a specification of the theoretically relevant constructs in MDM. In this regard Klein and Zedeck (2004, p. 932) stated that “clearly defined constructs are the building blocks of good theory ... thorough and thoughtful propositions linking the constructs — explaining what construct leads to what, when, how, and why —
provide the mortar”. The real world of MDM is over-determined in that many variables account for MDM. It is argued that understanding how managers make decisions requires an understanding of how the time-ordered influences and cumulative effects among environmental constraints, individual factors, concomitant affect and fatigue, combine to impact the quality of decisional processes.

Despite its practical appeal, the reality in MDM does not permit a strict sequential phasing of information search, evaluation, choice, and implementation activities as proposed by many conceptualizations. MDM is introduced as a dual, multifaceted process, that is, a cognitive problem of attempting to find the best solution (mostly under pressure of time) and making decisions against a background of divergent political interests. Further, most conceptualizations neglect the impact of self-referent motivational and affective influences on managers’ information search, deliberation and decision making process. It is argued that social cognitive theory offers a conceptual framework to clarify how individual cognitions and other individual difference factors, decision processes, and the environment account for the quality of MDM processes and outcomes. In keeping with social cognitive theorizing, individuals are able to exercise control over their effort and affect and this control is influenced by an individual’s self-efficacy beliefs. The discussion presents conceptual evidence of these links among the relevant constructs in order to formulate a coherent account of their relations in a parsimonious framework.

MDM, by its very context-specific nature, does not lend itself to simple analysis in actual organizational settings [see, for instance, Bandura and Jourden (1991); Critchfield and Kollins (2001); Leaptrott and McDonald (2008)]. While experimental research provides useful evidence regarding the nature and the significance of hypothesized variables that tend to enhance or inhibit the quality of MDM these settings are likely to limit generalizability of experimental results. Continued experimental research is clearly important for the further refinement of MDM, but non-experimental field research helps to understand how consequential decisions are actually made and how better decisions could be made in organizational settings, challenges not faced by experimental research.

The processes governing decision making are influenced by a multiplicity of interacting factors that take time to exert their influence on individual-factor variables and decision making in specific environmental contexts. Moreover, it is easy to overlook the implications of the
manager as a decision making agent for the organization. Managers do not make decisions in isolation, and social and institutional contexts influence decision processes and alter the goals held by managers (Beach & Connolly, 2005; Elbanna, 2006). Hambrick (2007) notes that relatively few researchers display an interest in this area because it requires access to large numbers of managers who are notoriously unwilling to submit themselves to scholarly investigation. These aspects contribute to limitations in the theory building of MDM.

The second section of this chapter outlines MDM as a process and provides conceptual evidence of the links between the theoretically relevant constructs of decision making within organizations. In addition, the utility of social cognitive theory is presented as a plausible framework to understand both affect and MDM processes as a function of individual-factor variables of the manager as decision maker, given constraints in their operative environments in organizations.

The last section of this chapter provides an integrative model of MDM that incorporates the multiple constellations of individual variable factors and self-efficacy beliefs in their relation to the quality of MDM processes and outcomes. The present researcher proposes that such a social cognitive framework could lead to modifications and refinements of the extant theory in order to advance insights into the multiplicity of antecedents and consequences in MDM.

THEORETICAL OVERVIEW OF MDM

Decision making is an ordered sequence of interrelated processes (e.g., Bazerman, 2006; Bonabeau, 2003; Brousseau, Driver, Hourihan, & Larsson, 2006; Driver, Brousseau, & Hunsaker, 1998; Koehler & Harvey, 2007) and a commitment to a course of action that is intended to produce a satisfying state of affairs (Yates et al., 2003). Good decision-making processes tend (on average) to lead to more desirable outcomes than do poor decision-making processes (e.g., Dean & Sharfman, 1996; De Dreu, Beersmaa, Stroebea, & Euwemab, 2006; Frisch & Clemen, 1994; Payne & Bettman, 2007).

The conceptual research suggests that the process of making a decision contains an initiating activity (i.e., looking for and selecting situations requiring decisions) and a design phase (i.e., seeking alternatives and evaluation), which precede a choice phase (i.e., dealing with choosing and accepting one alternative from the available alternatives). For instance, Janis
and Mann’s (1977) proposed a process consisting of: appraising the challenge, surveying alternatives, weighing alternatives, deliberating about commitment, and adhering despite negative feedback and opposition. Similarly, Wood, Atkins, and Tabenero (2000) describe decision processes in terms of two related but distinct subtasks, that is, exploratory search (seeking information) and deliberative processing (the degree to which individuals attend to and consciously process information acquired during exploratory search). The latter authors refer to a systematic-comprehensive process that includes attempts to gather information about criteria for a range of alternatives and to process the acquired information in a systematic manner.

The process of decision making may unfold over weeks, months, or even years, replete with personal nuances and institutional politics (e.g., Brousseau et al., 2006; Garvin & Roberto, 2001). Although an intimate relationship between the different stages in the process of decision making exists, long temporal disparities may emerge, as managers may seek solutions or evaluate possible alternatives even before they have collected all the necessary information (e.g., Bandura & Jourden, 1991; Wood, Bandura, & Bailey, 1990). Consequently, decisions made at one point in time influence the options and effects of later decisions, which requires managers to frequently recycle between different decisional operations in MDM (Bandura, 1997). Moreover, MDM represents an amalgam of a systematic-comprehensive and an emergent incremental-political process (e.g., Elbanna, 2006) and this dual explanation of MDM signifies the temporal and evolving nature of how decisions are made in organizations.

This dynamic nature of decision making underscores the time-ordered effects and multiplicity of constituent variables that impact on MDM and subsequent choices (see Brousseau et al., 2006; Hough & White, 2003; Papadakis & Barwise, 2002; Schneider & Barnes, 2003; Wood, Atkins, & Tabenero, 2000). MDM contains many antecedent and/or consequential distal or far-removed variables (e.g., political context, individual-factor variables) that are likely to be transmitted through additional links in a causal chain, and affected by other competing causes and random factors (i.e., distal mediation processes [see, for instance, Critchfield and Kollins (2001) and Shrout and Bolger (2002)].

Bandura (1991) argued that social cognitive theory offers advantages over other models of MDM since this theory is not constrained by the assumption of sequential phases of search, evaluation, and choice in making decisions as they evolve in organizations. Briefly, social
cognitive theory explains human functioning in terms of reciprocal causation among three categories of determinants: the individual’s cognitions and other individual difference factors, behaviour, and the environment (Bandura, 2006). Such a framework implies that MDM is an interactive process that is regulated extensively by a multiplicity of interacting factors that create reciprocal influences among individual factors, decisional actions, and environmental effects. Moreover, social cognitive theory acknowledges self-regulatory factors as a contributing influence in the application of individual capabilities in MDM. The utility of social cognitive theory is that it provides a succinct conceptual framework that allows for the isolation of temporal influences in order to examine the interdependencies and cumulative effects among individual factors, decisional processes, and environmental constraints in MDM.

A number of authors have, in fact, adopted social cognitive process theories in decision making to specify how antecedent conditions mediate decision processes. The conceptualizations of Janis and Mann’s Conflict Model (1977), Forgas’ (1995) Affect Infusion Model, and Payne, Bettman, and Johnson’s (1993) Adaptive Decision Maker are examples of decision-process theories which illustrate that individuals have a repertoire of decision strategies that are contingent on task, context, and individual difference factors. The fundamental assumption of these models is that individuals decide how to decide by considering a number of goals and that the contingent use of decision strategies represents an adaptive response to decision demands. Moreover, the basic hypothesis of these models is that decision making represents an adaptive balancing of goals while conserving limited attentional resources.

The social-cognitive perspective adopted for the purposes of this study views MDM as an integrated and interactive process that is regulated extensively by the organizational environment (i.e., task and context demands) and individual variable factors of the decision maker, as multiple and reciprocal determining factors (Bandura 1991). Figure 2.1 provides a specification of the theoretically relevant constructs and conceptual relations that reflect MDM as a stream of behaviour that integrates context, multiple goals, individual variables and the selection of decision making processes.

The discussion that follows firstly defines MDM as a psychological process. The manner in which managers construe the decision making context orients them toward a commitment to devote attentional resources to a course of action in order to satisfy multiple
goals in MDM. Individual factors, in turn, influence the engagement and allocation of attentional resources to give rise to the volitional selection of cognitively effortful decision strategies that account for the quality of MDM processes and outcomes.

The discussion introduces self-efficacy beliefs as a proximal and contextually situated individual factor that influences managers’ interpretative biases that reflect estimates about how effort and ability will combine and the type of affect a manager will experience in response decision demands. Finally, MDM is presented as inherently conditional on the independent and interactive influence of self-efficacy beliefs (via its regulation of effort and affect) in the application of individual capabilities, concomitant decision-generated affect and fatigue to account for MDM decision processes and outcomes.
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*Self-efficacy beliefs: Cognitive appraisal of decisional demands, regulation of attentional resources and decision-generated affect.

Figure 2.1 A Social Cognitive Framework of MDM
Figure 2.1 illustrates that the specific threats or benefits which arise from managers’ ongoing interaction with their decision context orient them toward particular goals, and how these selected goals are mediated by the managers’ subjective appraisals of their abilities. Consequently adaptive and maladaptive volitional action patterns follow directly from the selection of different goals selected and the type of goals individuals pursue, in turn, mediates the relationship between self-efficacy beliefs and performance (e.g., Locke & Latham, 1990a; Phillips & Gully, 1997; Thomas & Mathieu, 1994). Self-efficacy beliefs and goals are thus important proximal mediators and represent "the motivational hub," or "where the action is" (Locke, 1991, p. 296) in their relationships of distal individual differences (both cognitive ability and social self-confidence) and affect in MDM. Goals thus influence performance primarily through the application of directed, concentrated, and persistent attentional effort, whereas self-efficacy influences performance both through attentional effort and through the self-regulation of affect (Bandura, 1997; Bandura & Locke, 2003; Locke & Latham, 1990, 2001, 2002).

The Organizational Context and Goals

In the absence of a clear definition within the literature of managers as an agent for decision making in an organizational context, MDM as a context-dependent and multidimensional process is defined for the purposes of this study as the intentional and explicit commitment to devote attentional resources to a course of action in order to satisfy multiple goals in response to the subjective appraisals of the environment. In this subsection of the chapter, the organizational context is shown to feature prominently in MDM. The discussion elaborates how decision making is influenced by information overload, time deadlines and competing goals, all conditions that make great demands on managers. This is followed by a discussion which illustrates how the context influences the goals managers pursue.

Decisions and choices are not created in a vacuum (Beach & Connolly, 2005). MDM can be affected by a host of contextual factors that can profoundly shape choices (Bandura, 1997; Halebian, Markoczy, & McNamara, 2004; Krantz & Kunreuther, 2007; Lerner & Tetlock, 2003). Unlike most laboratory studies of individual decision making, MDM is sensitive to company size, conflicts about goals and the salience of incentives as internal aspects of context (Hough & White, 2003; McNamara & Bromiley, 1997; Shapira, 1997;
Sutcliffe & McNamara, 2001). Environmental uncertainty and hostility, industry characteristics and competitiveness, company performance and national culture, all represent additional external factors that impact on MDM (see, for instance, Elbanna & Child, 2007; Papadakis, 2006). One consequence of context is that there are rarely bounds on what information is potentially important and what is not for MDM (Hambrick, Finkelstein, & Mooney, 2005b). In addition, it is not the sheer volume or pace of information that matters, but the considerable ambiguity in MDM (Beach & Mitchell, 1978; Hambrick, Finkelstein, & Mooney, 2005a). In this regard, Mintzberg (1973, p. 191) noted that: “it is not the decision making under uncertainty risk or even uncertainty that a manager faces, but decision making under ambiguity”. This subjective experience of missing or inadequate information contributes greatly to complexity in MDM (see, for example, Gottfredson, 2002; Hough & White, 2003). In addition, ill-defined and ambiguous means-ends pathways that link short-term goals to more long-term outcomes (i.e., distal organizational objectives) provide managers with great latitude of actions that contribute to the complexity in the relationship between managers’ and organizational goals (Bandura, 1997; Hayward & Hambrick, 1997). Managers, consequently, need to seek explanations and answers to multiple expectations and are forced to decipher how others see things rather than merely understanding objective structures or systems. Weick (1995, p. 4) argued that this absence of a clear and accurate understanding of role expectations means that the assumptions necessary for rational decision making are absent and that this process of “sensemaking” literally “means the making of sense” when faced with uncertainty or ambiguity as a means to return a sense of stability to the organizational life world.

Fundamentally, the decision context forces managers to deal with two accountability problems: a cognitive problem of attempting to find the best solution (mostly under time pressure), and the decision between mutually exclusive goals (i.e., the problem of resolving divergent interests) (Butler, Davies, Pike, & Sharp, 1991; Dean & Sharfman, 1993b; Elbanna & Child, 2007; Ferris, Perrewé, & Douglas, 2002; Papadakis, 2006). This dual explanation of MDM refers to two types of processes that describe how decisions are made in organizations, that is, a systematic-comprehensive and an incremental-political process (e.g., Elbanna, 2006; see Figure 2.1 in this regard). The most fundamental feature of the systematic-comprehensive process is the emphasis placed on being rational in making decisions (i.e., a process focus), whereas the second process assumes that decisions emerge from an incremental context-
dependent process that reflects an amalgam of preferences of those who hold most power rather than on what is good for an organization. MDM can consequently be rational but not political, political but not rational, both rational and political, or neither (Dean & Sharfman, 1996).

Managers are rewarded when they demonstrate rationality in line with economic arguments of cost or risk in order to maximize the accuracy of their decisions (i.e., conformity to a rational decision). As individuals, however, managers are finite, flawed human beings, who reside in positions where the consequences associated with their humanness are significant. In this regard, Hambrick et al. (2005a, p. 478) note:

Under high job demands, managers have so much performance pressure, so many decisions to make, in the face of so much information, they simply cannot afford…to be comprehensive in their analyses or search for solutions…Importantly, it is not that executives facing high job demands purposely become less comprehensive. The pressures of the job may actually encourage them to try to be more comprehensive, but they cannot achieve that ideal.

Experimental research usually assesses decision making in an environment where contact with other individuals during the decision process is eliminated and such research assumes that the process is completely unaffected by interactions with one or more other individuals. Managers do not make decisions in isolation since organizations are made up of multiple interest groups that pursue local and own goals rather than organizational goals (Beach & Connolly, 2005; Garvin & Roberto, 2001). Consequently, decisions are embedded in institutional practices (McNamara & Bromley, 1997; Sutcliffe, & McNamara, 2001) and enmeshed in webs of interdependent relationships that require managers to defend their conclusions and reasoning to peers, subordinates, or superiors. This requires an endeavour of informal dependence on others instead of just formal control or power over others (Kotter, 1999). In this regard, Levinson (1994) observes that such institutional contexts foster continuous political ‘machination’ (p. 432) as individuals try to maximize their individual gains and vie for political position. This compels managers to exercise influence in order to obtain cooperation, information, and other resources in their management of power conflicts and building coalitions (Bandura, 1997). Managers, consequently, make decisions against the
background of these divergent political interests which act as constraints in MDM (Elbanna & Child, 2007; Lerner & Tetlock, 2003). Such politicization exerts influence on MDM and decisions often emerge from a process in which decision makers are less likely to be informed about what is feasible given environmental constraints since their attention is focused inside the organization around self-interest (Dean & Sharfam, 1996; Elbanna, 2006; Padadakis, 2006).

This inherent political nature of MDM makes it more difficult for managers to make decisions independently (Bandura, 2001; Beach & Connolly, 2005; Kotter, 1999; Shapira, 1997; Zaccaro, 2001). To make managerial decisions requires levels of persuasion, social coercion and what Pfeffer (1996, p. 295) referred to as “political savvy”. In addition, mutually exclusive demands (i.e., when compliance with one constituency’s demands makes compliance with another constituency’s impossible or extremely difficult) contribute to considerable ambiguity in MDM. This requires managers to know their constituents’ expectations, gain this information explicitly, and to actively produce actions congruent with those demands and/or to take steps to change constituent expectations (Tsui & Ashford, 1994).

Accountability is a universal feature of everyday management decision-making environments, and it represents an implicit or explicit constraint on virtually everything a manager does, yet it has been overlooked by theories of decision making in organizations (Lerner & Tetlock, 2003). The social pressure to justify one’s views to others refers to accountability and is defined as "an implicit or explicit expectation that one's decisions or actions will be subject to evaluation by some salient audience(s) with the belief that there exists the potential for one to receive either rewards or sanctions based on this expected evaluation" (Hall, et al., 2003, p. 33). Qualitative differences in terms of the nature of the audience and the context of accountability may result in distinct social and cognitive coping strategies in decision making (Lerner & Tetlock, 2003). Consequently, accountability qualifies as an enhancement-constraining context (Sedikides & Herbst, 2002; Sedikides, Herbst, Hardin, & Dardis, 2002).

Ambiguity and decision-making difficulty can be both objective and subjective parameters of the decision context. Differential appraisals provide a convenient summary of specific threats or benefits that arise in an individual’s ongoing interaction with the decision context and thus may moderate managers’ subjective experiences of complexity, ambiguity and conflict in their attempts to make a good decision. It is argued that managers who view MDM
as taxing do so primarily because they perceive their choices to be subjectively more difficult and are thus more likely to acquiesce to environmental dictates (see, for instance, Bandura, 1997). This is discussed in the following subsection.

Appraisals of the Decision Context

Appraisals refer to a cognized view about something in a certain context (Stajkovic, 2006). Individuals’ beliefs in their decisional efficacy affect their appraisal orientations which exerts an effect on judgment and choice (Cavanaugh, Bettman, Luce, & Payne, 2007; Lerner & Keltner, 2000). Such appraisals reflect an internal, subjective cognitive process that may not necessarily be linked to objective factors and task and context demands (Brown, Ferris, Heller, & Keeping, 2007). Beach and Mitchell (1978) suggest that selection of a decision strategy is a subjective process that depends on the type of problem, the surrounding environment, and the individual attributes of the decision maker. Ganster (2005) states that subjective appraisals play a significant role in transforming perceptions of decisions into cognitive appraisals of difficulty. Thus, managers’ subjective interpretation of their context may be evoked for reasons other than objective decision parameters and these interpretive biases affect the selection of decision strategies and processes.

Consequently, the subjective demands in MDM are not a fixed property of situational events but represent a relational property concerning the match between perceived coping capabilities and the potentially aversive aspects of the environment (see, for instance, Bandura, 1991; Hu, Huhmann & Hyman, 2007). Appraisals are determined by simultaneously perceiving environmental demands and personal resources (Han, Lerner, & Keltner, 2007; Loewenstein, Weber, Hsee, & Welch, 2001; Roseman & Evdokas, 2004). These subjective interpretations provide a convenient summary of specific harms or benefits that arise in the individual’s ongoing interaction with the social environment and accompany action tendencies to reduce uncertainties (Raghunathan & Pham, 1999). Appraisal tendencies are thus goal-directed perceptual processes through which affect colours the interpretation of stimuli which exerts effects on decision making until the affect-eliciting problem is resolved (Lerner & Keltner, 2000). Control perceptions capture an individual's appraisal of an objective situation (Ganster,
1989), whereas self-efficacy beliefs are specific appraisals of one's capacity to execute actions to exercise that control (Bandura, 1997; Shapira, 1995).

Control beliefs reflect and determine self-efficacy beliefs (Armitage & Conner, 1999; McCarthy & Newcomb, 1992) and beliefs in controllability are a means of creating managerial self-efficacy beliefs (Bandura & Wood, 1989; Wood & Bandura, 1989a). Consequently, managers' beliefs in their decisional efficacy affect their appraisal orientations. For example, individual differences in appraisal have measurable effects on individuals’ responses in handling the pressure of justifying their views to influence others (Green, Visser, & Tetlock, 2000; Lerner & Tetlock, 1999, 2003). Thus, ease of justification is best viewed as a subjective interpretation (i.e., felt accountability), rather than an objective condition (i.e., formal accountability mechanisms). This explains why individuals, occupying comparable work environments with equivalent demands and expectations, report levels of felt accountability that are inconsistent and even contradictory (Hochwarter et al., 2007).

Bandura (1999) argues that most environmental events exert their effects through cognitive processing rather than directly. Consequently, appraisals refer to a cognized view about something in a certain context (Stajkovic, 2006). Although related, Campbell (1988) argues that it is useful to distinguish between the objective and the subjective complexity that is experienced by an individual engaged in the task since these complexities are not necessarily identical. Subjective task complexity uniquely affects task performance independent of objective task complexity (Ganster, 2005; Maynard & Hakel, 1997). Thus, Beach and Mitchell (1978, p. 444) state:

While it is not possible to entirely disentangle task characteristics and decision maker characteristics, it is possible to separate them conceptually by defining task characteristics as the decision maker's interpretations of the demands and constraints of the specific task at hand.

The perceptions of objective task demands, consequently, are typically more important than the actual demands (Fisher & Noble, 2004; Lucas, Alexander, Firestone, & Baltes, 2006). In this regard, Bandura (1997) argues that the environment does not come into being until it is selected and activated by appropriate action. Although managers may not have much control over the presence of their imposed operative socio-structural environment, the social and
institutional environment constitutes a potentiality that can be actualized by appropriate action, for example, social skill activation (Hochwarter et al., 2006). Consequently, managers’ appraisals of their objective situation and what parts of the environment and events come into play as the ‘actual’ environment depend on how they construe (Mangos & Steele-Johnson, 2001) and act on the demands imposed by it (Sonntag & Frese, 2003).

Individuals thus elicit reactions from the imposed operative environment that affect their conceptions of themselves and others in ways that either strengthen or reduce the environmental bias (Bandura, 2008). MDM demands can thus be both a subjective and an objective parameter of decision difficulty, and this difficulty may depend in part on individual differences in self-efficacy beliefs (Bandura & Jourden, 1991). Consequently, managers with less confidence in their ability to maximize their chances of demonstrating high ability are more likely to be taxed by the erroneous influence of subjective difficulty in MDM (Bandura, 1997). In essence, then, self-efficacy beliefs provide for moderation, via social cognition, that helps define decisions as difficult or not (Mangos & Steele-Johnson, 2001). Hambrick et al. (2005b, p. 507), in this regard, note:

Executives who are intensely prepared—by virtue of their prior experiences, training, and readiness for difficult conditions—are less likely to feel the same degree of pressure from a set of task stimuli than are other executives who always seem to be catching up. The intensely prepared executive is able to attend to his or her task and performance challenges and is unlikely to feel overwhelmed or stressed, compared to a less prepared executive.

Individuals’ goal orientation creates the framework within which they interpret and react to their environment (Dweck, 2006). Nicholls (1984) argues that choice, and therefore action, is a rational attempt to attain goals or incentives efficiently or economically (i.e., maximize gains and minimize losses). Individuals make decisions because they want to move towards satisfying goals that are far richer than what can be captured in utility-maximizing models (Schneider & Barnes, 2003). It can be argued that a major meta-goal for decision making is aimed at mastering one’s environment (via competence) because individuals perceive that, through repetition of action, they can master their ability to successfully interact with their environment. In a seminal work White (1959) proposed that the urge to have an
effect on and master one’s environment is sought for the pleasure of the feelings of efficacy that accompany effective interaction with the environment.

In the next subsection, goals are shown to figure prominently in MDM and, unlike individual decision making models that assume that all decision makers have one goal, that is, to maximize expected utility, managers use decision making to meet multiple goals (see Figure 2.1).

Goals Managers Pursue

Most of human behaviour is the result of an individual’s consciously chosen goals and intentions (Mitchell & Daniels, 2003). In making decisions, individuals make choices in order to accomplish varied goals. Locke and Latham (2002) state that goals, as a theory of motivation, influence performance through a directive function, that is, they direct attention cognitively and behaviourally toward goal-relevant activities and away from goal-irrelevant activities. In addition, goals have an energizing function in that high goals lead to greater effort and affect persistence. Finally, goals affect action indirectly by leading to the arousal, discovery, and/or use of task-relevant knowledge and strategies.

Goals are context dependent (Beach & Connolly, 2005; Kanfer & Ackerman, 2005; Krantz & Kunreuther, 2007). Situational and temporal contexts can thus contribute to the ambiguity of goals to pursue in MDM, that is, to find the best solution and to meet political expectations. Moreover, the longitudinal nature of MDM requires managers to consider multiple goals (i.e., personal and long-term economic goals). For instance, success in short-term goals may contribute to feelings of success but may not necessarily produce expected gains in long-term organizational performance as the cumulative effects of good or faulty decisions are often delayed. In many cases, short-run gains may often have to be sacrificed for desired distal attainments (Bandura, 1997). In addition, ignorance of the order of importance of goals (i.e., the temporal nature of goals) creates a distorted view in which the importance of goals can be easily lost, thus limiting MDM’s fundamentally dynamic character (Schneider & Barnes, 2003).

Most managerial decision theories assume that decision makers pursue the same goal (i.e., utility maximization involving economic goals). However, economic goals do not adequately capture the wide range of goals that individuals actually seek (Schneider & Barnes,
Theoretical attention to goals is therefore a prerequisite for a meaningful understanding of MDM since goals elucidate why managers make certain decisions, what kinds of decision strategies they adopt and what constraints they experience throughout the decision making process. The next subsection outlines the multiple goals individuals have and how they decide to resolve conflicts between their own and others’ goals in order to conserve limited cognitive (i.e., finite attentional) resources.

**Temporal goals**

It is often difficult to determine progress toward a distal goal (Schunk, 1995) and it has been noted that the further away a goal is temporally, the less impact it has on individuals’ motivation (Latham & Brown, 2006; Seijts, Latham, Tasa, & Latham, 2004). In this regard, Locke and Latham (2002) maintain that individuals sometimes spontaneously generate proximal goals (i.e., present-directed intentions) when assigned distal goals. Converting distal goals into reality operates as its own reward in the service of self-satisfaction from personal accomplishments (i.e., interim progress and mastery) (Bandura, 1991). Goals embodying such self-engaging properties (i.e., discrete, short-term goals that reflect matters of personal importance and value) can bolster motivation and serve as powerful motivators of action because their attainment is an early indication of accomplishment (Bandura, 1997). These proximal outcome goals appear to be particularly beneficial with tasks that individuals experience as complex because of their ambiguity (Latham & Seijts, 1999).

This line of reasoning argues that proximal, short-term goals are achieved more quickly and result in higher motivation and better self-regulation than more temporally distant, long-term goals (Bandura, 2001). Short-term proximal goals focus and sustain attentional effort on task-relevant strategies or context-specific objectives thereby ensuring goal-directed actions (see, for example, Kanfer & Ackerman, 2005; Krantz & Kunreuther, 2007). Such tangible self-motivators (Bandura, 1986) contribute a continuing source of self-motivation because they provide individuals with additional specific information about performance that is not present when only a distal goal is set. As individuals experience these ‘small wins’, they increase their belief that they can attain distal goals (Latham & Brown, 2006). By making self-satisfaction conditional on performances that match a personal index of merit, individuals are able to apply
the effort necessary to accomplish what they value (Bandura & Cervone, 1983; Bandura & Jourden, 1991).

In constructing or selecting plans to achieve multiple goals in their decision making, individuals structure how to decide by considering how to balance a number of goals while conserving limited cognitive (i.e., finite attentional) resources (Luce, 2005; Luce, Bettman, & Payne, 1997; Luce et al., 2001). Svenson (2003) argues that decision making, by and large, is the art in resolving such conflicts as those between inner goals, between one’s own and others’ goals, and between conflicts concerning how to evaluate alternatives in relation to competing goals.

**Multiple Goals Managers Pursue**

When individuals establish goals, they devote a portion of their total available attentional resources to construct or select plans to achieve multiple goals in their decision making. This dedication of attentional resources differentiates goals from wishes and intentions (Kanfer, 1990). In a world of limited time and attentional resources, managers are faced with repeated choices over time concerning where to focus their attention and how to revise these decisions in response to changes in the environment (Bandura, 1997). The relevant question in MDM is thus rarely which course of action to follow but rather how to best allocate attentional resources and switch between tasks to efficiently accomplish these multiple goals (DeShon & Gillespie, 2005).

Bettman, Luce, and Payne (1998) present a useful theoretical framework for understanding how managers make choices in order to accomplish their goals. These authors identify four important meta-goals in decision making as: (a) minimizing the cognitive effort (i.e., attentional resources) required to make the choice, (b) maximizing the accuracy of the choice, (c) maximizing the ease of justifying the decision, and (d) minimizing the experience of negative affect when making the choice. These choices in order to achieve goals in MDM are expanded on in the discussion that follows.


**Minimizing cognitive effort**

Cognitive effort represents the proportion of total attentional resources and the extent to which these resources toward a task are maintained over time (Kanfer & Ackerman, 1989, 1996). Building on Kahneman's (1973) model of attentional capacity, Kanfer (1990) suggested that when individuals establish a goal, they devote effort (a portion of their total available attentional resources to goal accomplishment). Theorists such as Kuhl (1987) and Corno (1993) have argued for the distinction between motivation and volition, with motivation guiding intentions about engaging in particular activities, and volition guiding the actions used to attain a goal. Whereas goals guide decisions about engaging in effort (Austin & Klein, 1996; Locke, 1991; Locke & Latham, 2002), volition determines whether or not an intention to act is fulfilled. Individuals first decide whether to allocate attentional resources toward goal attainment (engagement of effort) and then decide how much of the attentional resources should be devoted to a task. With regards to the latter the attentional allure of off-task concerns or affective events can present great challenges to individuals’ ability to regulate task-focused attention (Weiss, Ashkanasy, & Beal, 2005).

Attentional effort is a dynamic construct that changes within individuals in response to individual and environmental factors (Beal, Weiss, Barros, & MacDermid, 2005; Kanfer & Ackerman, 1996; Payne & Bettman, 2007; Schmeichel & Baumeister, 2004; Yeo & Neal, 2004, 2008). Bandura and Locke (2003) noted that individuals mobilize their effort and personal resources based on their anticipatory estimation of what it would take to fulfill those standards. Attentional effort is thus a covariate of perceived difficulty and individuals increase their allocation of attentional resources toward on-task activities when tasks become more difficult (see, for example, Foo, Uy, & Baron, 2009; Yeo & Neal, 2004, 2008) because of a discrepancy between current and desired levels of performance (Carver & Scheier, 2005; Vancouver, More, & Yoder, 2008).

A focal issue in MDM is to make a good decision (i.e., conformity to a normative solution) and is cognitively often more effortful (Connolly & Ordonez, 2003). Consequently, making accurate decisions can be highly costly in terms of the attentional resources required. In this regard, Payne and Bettman (2007, p. 113) note:

An increase in the cognitive (or emotional) cost of processing an item of information, like the cost of acquiring an item of information, will lead to greater
use of simplification mechanisms that minimize information processing. The cost of acquiring and processing an item of information may also affect the order in which information is processed, as well as whether or not an item is processed at all.

Exerting attentional effort directed at finding, identifying and using information and arriving at the most accurate alternatives can lead an individual to adopt an aversive stance to making a decision (Anderson, 2003). Expending a large amount of attentional resources might be affectively unpleasant (Fisher & Noble, 2004) and/or taken as indicative of low ability (Bandura, 1991; Dweck, 2006; Dweck & Molden, 2005). Fisher and Noble (2004) noted in this regard that the perceived difficulty of a task is a function of how much effort an individual believes is necessary for success, and that task difficulty is analogous to how much effort is necessary for success. Perceived difficulty is a covariate of attentional effort (Yeo & Neal, 2004). Thus, individuals would allocate attentional effort to compensate for perceived ability if they thought effort mattered and there is a great deal of volition that permits individuals to exert more or less effort despite how difficult they perceive the task to be (e.g., Lucas et al., 2006; Smillie, Yeo, Furnham, & Jackson, 2006).

The conservation of attentional resources may in fact be both intelligent and adaptive in order to save attentional resources (Ganster, 2005; Payne & Bettman, 2007). Individuals may adopt decision processes that represent the best trade-off between a goal of achieving an accurate decision and saving attentional effort. When faced with information that is too voluminous or complex under time stress individuals employ simplifying strategies, or heuristics (i.e., simple and fast rules of thumb) and engage in filtration (i.e., focus on a subset of the available information) (Payne & Bettman, 2007; Plous, 1993). Further, managers are forced to balance an accuracy goal (i.e., conformity with rationality) with opportunity-cost time (Payne, Bettman, & Luce, 1996; Pelham & Neter, 1995). Under such conditions, adopting a comprehensive decision strategy may come at a cost in terms of time (Brousseau et al., 2006; Payne et al., 1996) and present lost opportunities where a delay can result "in failure as windows of opportunity close" (Eisenhardt, 1993, p. 121).

This tendency to make judgments without complete information may lead to decisions that can contribute to failure, or may alternatively even be the reason why some entrepreneurs
are successful (Le Roux, Pretorius, & Millard, 2006). Heuristics enable individuals to inject their personalized interpretations and their experience to search for and interpret information, what they find familiar or what they are comfortable with, in order to select among options that enable them to make up their minds quickly and easily in decision making (Geletkanycz & Black, 2001; Hambrick et al., 2005a, 2005b).

Managers as agents for decisions in organizations bring available attentional resources to bear on their decision making and they are required to direct these resources toward making accurate decisions that serve the interests of the organization. Although the advantage of heuristics is that it simplifies the decision task and reduces the time and attentional effort (Tversky & Kahneman, 1974), it leads to what Keren (1996) referred to as motivated mistakes. However, it might actually allow managers to make the best decisions possible under difficult circumstances (Ganster, 2005). Consequently, it can provide relatively high levels of decision accuracy with substantial savings in the allocation of attentional resources (i.e., effort) and in minimizing the experience of negative affect.

**Maximizing the accuracy of choice**

Trying to solve the decision problem effectively increases the weight given to a goal of maximizing accuracy. Decision strategies with high cognitive effort are thus more likely to be used when decision accuracy is prioritised over saving cognitive effort (attentional resources) (see, for example, Bettman et al., 1998; Foo et al., 2009). Such a motivation to perform accurately is often associated with a more rational, systematic-comprehensive decision process to meet the best interests of the organization.

Pursuing an accuracy goal leads to better performance when there is no time pressure (Payne et al., 1996). In fact, Pelham and Neter (1995) argue that pursuing an accuracy goal leads to increased performance in environments that did not involve opportunity-cost time pressure. Consequently, decision makers who are more motivated to be accurate can sometimes make decisions in ways that are not adaptive when deciding in high-velocity environments.

Situational factors such as need for accuracy, degree of external control, and social norms and expectations also motivate a goal to be accurate in decision making. Managers are rewarded when they demonstrate rationality in line with economic arguments of cost or risk in order to maximize accuracy of decisions (i.e., conformity to a rational decision). For example,
accountability to others is a contextual determinant of accuracy in decision making (Green et al., 2000; Lerner & Tetlock, 2003).

Maximizing the ease of social influence and justifying the decision

Accountability conditions require an effortful decision process (i.e., an increased level of effort to meet accuracy goals). Meeting conflicting goals of diverse interest groups can lead managers to weigh ease of justification more heavily than effort considerations (i.e., a heuristic search for good reasons to use as justifications) in order to minimize negative affect (Bettman & Payne, 2007; Luce et al., 2001). This is especially the case when a constituent’s views are unknown, or when a constituent’s views are reasonably well-informed, or when constituents value accuracy, and when constituents have a legitimate reason for inquiring into the reasons behind the manager’s judgments or choices (Lerner & Tetlock, 2003; Sedikides & Herbst, 2002). Consequently, managers prepare themselves by engaging in an effortful and self-critical search for reasons to justify their decisions in anticipation of how it will be evaluated by others (Brousseau et al., 2006; Green et al., 2000). This accountability-political influence relationship can lead to aversive negative affect (Perrewé et al., 2004).

Maximizing ease of justification may involve the use of heuristics in social influence situations based on social goals individuals employ (Cialdini & Goldstein, 2004; Janssen, Fennis, Pruyn, & Vohs, 2008). Motivated by social goals to get along (Hogan & Shelton, 1998), impression-motivated managers may base decisions on the low-effort acceptability, consensus or relational heuristics (Bettman et al., 1998; Chen, Shechter, & Chaiken, 1996; De Dreu & Van Kleef, 2003). that lead individuals to shift their decisions toward that of their audience and choosing compromise options. Meeting conflicting goals of diverse interest groups can thus lead managers to craft impression-motivated compromises in order ‘to go along to get along’ with divergent interest groups. Individuals may thus weigh the ease of social goals more heavily than effort considerations (i.e., an accuracy goal) as a way to minimize negative affect that emanates from potential interpersonal conflict (Bettman & Payne, 2007; Luce et al., 2001). Alternatively, managers may also avoid decisions in order to minimize aversive affect (Anderson, 2003, 2007).
**Minimizing decision-generated affect**

Affect is a function of goals individuals pursue and their reaction to subsequent outcomes (Locke & Latham, 2002). Forty years ago Simon (1967) reasoned that the experience of affect calls for a reprioritization of goals in order to induce individuals to interrupt their behaviour (i.e., action goals) and substitute present goals with higher priority goals. Goals are deeply connected to the self and affect arises whenever there is a significant change in the likelihood of reaching one’s goals. Carver and Scheier (2005) argue that goals are hierarchically structured and that higher-level goals specify the purpose (i.e., the ‘why’ or distal desired states) of action, whereas lower-level goals direct increasingly more specific actions (i.e., the ‘how’ or the means) to obtain the higher-level goals. These authors argue that goals placed higher in the hierarchy are fundamental to physical and mental health and that, when discrepancies in these fundamental goals are large, not much else matters to an individual. Forgas and Laham (2005, p. 182) note in this regard that “arguably, one of the most common and important goals people have in everyday life is the maintenance of a reasonably positive, optimistic affective balance despite the manifold challenges they face”.

Consequently, one salient goal in decision making is coping with or minimizing decision-generated negative affect (Luce, Bettman, & Payne, 1997; Luce, 2005). Individuals seldom come close to a state of detached affect when making decisions that implicate their own interests and produce conflict (Luce, 2005; Svenson, 2003). It is noteworthy that managers’ considerations regarding negative affect become more pronounced in situations that involve higher-stakes decision outcomes (Luce et al., 2001). In fact, many managers describe affect-laden decisions as difficult even if the relevant information is easy to comprehend.

Decisions, thus, may depend on minimizing unpleasant affective experiences, rather than maximizing the expected utility of the chosen outcomes (see, for example, Mellers, Schwartz, & Ritov, 1999; Mellers, Schwartz and Cooke, 1998). In fact, Baumeister, Vohs, DeWall, and Zhang (2007) argue that minimizing affect is a prime factor in most behavioural choices. Decision makers, thus, adapt to negative affect by simply adopting easier decisions (Payne & Bettman, 2007) or even avoid making decisions (see Anderson, 2003, 2007; Ferrari, 1991a, 1991d; Ferrari & Pychyl, 2007; Green et al., 2000; Luce, 2005). Such shifts in goals in order to reduce negative affect are motivated by a concern to ‘repair’ one’s affect through taking action either to reduce or to change the intensity of affect (Forgas & Ciarrochi, 2002;
Forgas & Laham 2005; Gohm, 2003; Larsen & Prizmic, 2004). The various decision options adopted to minimize affect are discussed later in this chapter.

The discussion thus far has highlighted how properties of the decision environment influence goals and the selection of decision process strategies. Decision-task variables such as information load and time constraints were shown to have an impact on the relative effort to acquire and use information in order to meet the criteria to make a good decision (i.e., accuracy of the choice). Moreover, it was shown that MDM is embedded in a political/social context that contributes to considerable ambiguity. This requires managers to actively produce actions congruent with constituent demands and/or to take steps to change their expectations. It has been pointed out that making a decision in organizations requires managers to apply a systematic-comprehensive decision process which calls for the application of cognitive abilities, as well as social self-confidence (as prerequisites for information acquisition and the political problem of resolving divergent interests) in order to facilitate decision implementation.

MDM is thus nearly always multidimensional in nature, involving several ability and skill dimensions. These individual variables, illustrated in Figure 2.1, are presented in the next subsection.

**Individual Variable Factors**

Payne and Bettman (2007) argue that decision making is best understood from the determinants of attentional resources as a function of task, context, and characteristics of the decision maker. The discussion thus far has argued that MDM is an effortful process (Connolly & Ordonez, 2003) and costly in terms of the attentional resources required (Payne & Bettman, 2007). Effort in the context of this thesis is conceptualized as the amount of attentional resources devoted to a task and provides for a theoretical linkage between distal individual factors and proximal volitional/motivational processes on individual ability/motivation-performance relations (see, for example, Kanfer & Ackerman, 2000a, 2000b; Kanfer, Ackerman, & Heggestad, 1996). Kanfer and Ackerman (1989, 1996) and Kanfer and Heggestad (1997) proposed a distinction between distal influences on action, in the form of relatively stable attributes, and proximal influences on performance associated with individual differences in self-regulation. This approach permits a conceptualization of attentional resource allocation approach that permits a distinction between a motivational process that affects an
individual’s decisions to exert effort (distal), and the volitional processes by which intentions are translated into performance (proximal). Such proximal motivational processes determine the distribution of attentional effort across on-task and off-task activities during performance.

The influence of distal domain-independent individual variable factors (i.e., cognitive ability and social self-confidence) is indirect in their relationship to decision making processes in that they reflect individual differences in the total attentional capacity that can be devoted to tasks (Kanfer & Ackerman, 1996). The capacity of available attentional resources does not univocally determine performance in tasks since individual differences in self-regulatory or motivational processes, as a proximal influence on performance, impact on the extent to which intentions are translated into performance.

Thirty five years of motivation research demonstrates that attention drives effort (Locke & Latham, 2002). Motivation reflects the direction and proportion of total attentional effort directed to the task (see, for example, Kanfer & Ackerman, 2005) and strengthens the allocation of attentional resources in contexts that require sustained effort (i.e., persistence) (see, for example, DeShon, Brown, & Greenis, 1996; Yeo & Neal, 2008). Self-regulation reflects the exercise of effortful attention and affective reactivity (Eisenberg, Smith, Sadovsky, & Spinrad 2004) to direct attentional effort and the ability to regulate affect (Peterson & Seligman, 2004; Weiss et al., 2005). Further, self-efficacy beliefs are central to the self-regulation of effort allocation intentions and the regulation of affect (see, for instance, Bandura, 1997) and are thus construed as proximal (i.e., task-specific and associated with a particular situational context) and a more direct influence on performance. Several researchers propose that self-efficacy beliefs mediate between distal individual differences and are essential in order to permit individuals to effectively adjust their attentional resource allocations as task demands change (see, for example, Beal et al., 2005; Kanfer & Ackerman, 1996; Weiss et al., 2005).

The operating environment of managers requires individuals to deal with information-processing demands and social complexity (Zaccaro, 2001). Earlier in this chapter it was shown that MDM is a dual process that combines a rational, comprehensive process (Hough & White, 2003) with a context-specific political and accountability process (Elbanna & Child, 2007; Lerner & Tetlock, 2003; Papadakis, 2006). With regards to the former, MDM represents a rational, systematic-comprehensive process of acquiring and deliberating with information in order to make decisions (Elbanna, 2006; Hough & White, 2003; Wood et al., 2000).
addition, MDM is also a political/social process (Beach & Connolly, 2005; Brousseau et al., 2006; Elbanna & Child, 2007; Kolodinsky, Treadway, & Ferris 2007). Gaining compliance requires that the political interests of others must be obtained in a manner that promotes accuracy in decisions (even in cases where opposition is likely to be high). This process may bias the collection and use of information, deliberation and decisions about alternatives in order to gain the favour of those individuals managers feel accountable to (see, for example, Green et al., 2000; Lerner & Tetlock, 2003). This requires managers to exercise social (i.e., persuasion, negotiation) and rational modes of social influence in their management of power conflicts and building supportive coalitions (see, for example, Ferris et al., 2007; Hochwarter et al., 2007; Sullivan, O'Connor, & Burris, 2003).

Consequently, this dual process of MDM implies that individual differences in cognitive ability and personality/social traits, independently and in combination, account for individual differences in the quality of MDM processes and outcomes. Moreover, although cognitive ability and personality traits are empirically and conceptually distinct (Ferris et al., 2002), they are related in a temporal order in MDM. In fact, Russell (2001) demonstrated in a longitudinal study that cognitive predictors accounted for short-term business execution and personality-related predictors predicted longer term performance trends amongst executives. Further, Motowidlo, Borman and Schmit (1997) provide a useful taxonomy to conceptualize the unique contribution of cognitive ability and personality traits in work performance. Their theory divides job performance into two groups of dimensions, namely task (substantive) and contextual performance, with the former aligning with cognitive ability and the latter accounting for personality traits. These authors also argue that, although the strongest effects of cognitive ability are on task performance, it is possible that cognitive ability also contributes to contextual performance through its effects on individual characteristic adaptations. Similarly, although the strongest effects of personality traits are on contextual performance, some personality traits also have some effect on task performance. Despite these ‘crossover’ effects, personality traits are more strongly associated with the contextual performance domain and cognitive ability with the task performance domain. In the next subsection the influence of cognitive ability and social self-confidence as distal domain-independent individual variable factors are discussed.
Cognitive Abilities

Cognitive abilities are hypothetical attributes of individuals that are manifest when individuals perform tasks that involve the active manipulation of information (Murphy, 1996). Regardless of the occupation or job under consideration, cognitive ability predicts overall job performance (Ones, Viswesvaran, & Dilchert, 2005a; Schmidt, 2002). Gottfredson (2002, p. 30) conceptualizes cognitive ability as a generic “all purpose tool” to process any sort of information in order to solve any kind of problem. In this regard, Chen, Casper, and Cortina (2001) suggest that individuals with higher cognitive ability may be more likely to accomplish complex tasks. Cognitive ability is, consequently, a significant determinant of individual differences in information-processing tasks (e.g., Chen, Casper, & Cortina, 2001; Finucane & Lees, 2005; Hu et al., 2007; Kanfer & Ackerman, 2005). For example, verbal ability (see, for example, Parker & Fischhoff, 2005; Zaccaro, 2001) and numerical ability are required for decision tasks such as analyzing, interpreting and understanding relevant information, creating, conceptualizing and integrating information, and reasoning about it (see, for example, Peter & Levin, 2008; Peters et al., 2006).

A large and consistent distinction among jobs is the complexity of their information-processing demands. Tasks high in their information processing demands correlate most highly with job complexity (Gottfredson, 2002; Jaques, 1996; Wood et al., 2002) and display a high validity for predicting task performance by occupational group (for example, upper management jobs that represent greater information processing complexity) (Bertua, Anderson, & Salgado, 2005; Schmidt & Hunter, 2004). Various authors also indicate that cognitive ability is important for decision making (Bartram, 2005; Conway, 2000; Schmidt, Shaffer, & Oh, 2008; Stanovich & West, 2000; Weekley & Ployhart, 2005). In fact, cognitive limitations may restrict decision making performance (e.g., Parker & Fischhoff, 2005). Individuals with higher levels of cognitive ability have a larger pool of attentional resources than their counterparts and require a smaller proportion to achieve the same performance outcome. When high ability individuals perceive an increase in difficulty, the corresponding increase in attentional effort is proportionately smaller than that in their counterparts. Consequently, lower cognitive ability individuals need to make larger proportional attentional resource adjustments to achieve the same outcome as their counterparts (Yeo & Neal, 2008).
Cognitive ability also contributes to contextual performance (Motowidlo et al., 1997). For example, in one of the first empirical studies in the organizational sciences to investigate the joint contribution of cognitive ability and social influence Ferris, Witt, and Hochwarter (2001, p. 1081) demonstrated that the possession of higher levels of cognitive ability provided individuals with high levels of social influence a "boost" necessary to increase performance. Conversely, an increased display of social influence in conjunction with low cognitive ability led to lower performance. Schmidt et al. (2008) suggest the possibility that individuals use their cognitive ability to control the expression of their personality dispositions in their behaviour. For example, extraversion incorporates individual traits associated with sociability and general activity level (talkative, active, assertive) and managers could use their cognitive ability to learn to display such extraverted behaviours, even though such behaviour is not their natural or spontaneous inclination.

The following subsection describes social self-confidence as an intra-individual trait of ascendancy, as a proxy to influence others. Social self-confidence as a behavioural response is a relatively stable and enduring trait that is mediated by a trait-relevant context that mediates social influence. The subsection will first highlight the importance of social traits in MDM, followed by an outline of how traits relate to social skill. The discussion is followed by a description of confidence as an additional individual variable. Finally, self-confidence as a composite trait is defined for the purposes of this study.

Social Self-Confidence

The social and political contexts of organizations often yield little clear information about decision parameters and problem boundaries and, accordingly, it is difficult if not impossible for managers to achieve their goals either independently or through persuasion and formal authority alone. Consequently, MDM requires managers to use a blend of direct and covert persuasion and social coercion to balance a myriad of social and political expectations and interests in order to influence decisions (Bandura, 1997; Beach & Connolly, 2005). In fact, an unwillingness to take the social and political aspects of organizational life seriously is a common reason why managers fail (Hogan, 1994). Consequently, interpersonal or social effectiveness constructs are important in the prediction of management performance (see, for example, Semadar, Robins, & Ferris, 2006; Wayne, Liden, Graf, & Ferris, 1997). In spite of
their importance, Zaccaro (2001) notes that personality and social traits have been subsumed by cognitive ability and are infrequently referred to in MDM since some theorists and conceptual researchers have considered them to be proportionately less important than cognitive ability factors.

Although there has been a resurgence of interest in social skills in organizations, little conceptual and empirical research has attempted to distinguish between the proliferation of social skills constructs in order to aid a more informed and parsimonious understanding of social effectiveness. In this regard, Ferris et al. (2002, p. 50) conclude that social effectiveness is “a rather broad, higher-order, umbrella term which encapsulates a number of moderately-related, yet conceptually-distinctive, manifestations of social understanding and competence”. It is therefore necessary to conceptualize social self-confidence traits as an important construct for the purpose of this study.

**Personality traits**

Personality traits are intra-individually consistent and inter-individually distinct propensities to behave in some identifiable way (i.e., as expressing a given trait) and, as propensities, traits are latent constructs (Tett & Guterman, 2000). Allport (1924) considered traits to imply ranges of behavioural possibilities that are activated according to situational demands. For example, Allport states that extraversion serves as a salient proxy for social skill only when coupled with extensive experience, learning, and interaction with evaluative cues. Traits-as-dispositions are thus best understood when both individual and environmental determinants are simultaneously considered. In this regard, Tett and Guterman (2000) argue that trait-relevant behavioural intentions are strong in situations that provide appropriate cues for trait expression, an idea that has roots in Murray’s (1938) notion of ‘situational press’. It was pointed out earlier that individuals’ subjective appraisals of difficulty in a task produce different affective reactions depending on how it is appraised (Bandura, 1997; Mangos & Steele-Johnson, 2001). Stemmler (1997, p. 214) argues that affect is a potent indicator of selective personality trait activation and utilization:

Emotions signal actual, adaptationally significant features of context and environment...If environmental demands change, the pattern of elicited emotions might also change and with it the best fitting person characteristic. However,
instead of changing environmental demands, one could also attempt to vary just
their intensity dimension. Therefore, specific temperament traits will be more
likely activated under high than medium or low intense emotion inductions.

Similarly, Hochwarter et al. (2006) state that trait activation is dependent on contextual
cues and with practice and effort individuals develop a sense of when it is necessary to use
social skill. Consequently, situational cues evoke the expression of trait-relevant behaviours
(Lievens, Chasteen, Day, & Christiansen, 2006; Tett & Burnett, 2003). Further, unambiguous
behavioural situations result in few differences in how individuals respond to a situation,
whereas ambiguous situations (characterized by more unclear expectations) evoke greater
variability in behavioural responses (Hough, Ones, & Viswesvaran, 1998). Hogan and Shelton
(1998) argue for a socio-analytic approach to personality as a promising theoretical framework
to understand how personality traits relate to social skill. These authors note that two
motivational constructs are particularly relevant mediators for personality trait effects in work
settings. Hogan and Shelton further argue that the two primary motives that drive behaviour
are the desire to ‘get along’ and the desire to ‘get ahead’ and some individuals are thus more
motivated to get along, whereas others are more motivated to get ahead. Different individuals
use different behavioural strategies as attempts to achieve one or both of these goals (see, for
example, Joyce Hogan, & Holland, 2003). Consequently, a clear, interpretable pattern of
relations emerges regarding the motive to get along with others (e.g., empathy and
agreeableness) versus the motive to get ahead (e.g., potency measures) and it stands to reason
that successful managers display socio-political trait-dispositions to get ahead rather than those
necessary to get along.

Extraversion and ambition are components of a larger construct of surgency (the degree
of impact), arousal levels and the availability of attentional resources (energy) that are manifest
potency behaviours related to resourcefulness, decisiveness, dominance, independence, and
social presence (Conway, 2000; Craik et al., 2002). Although extraversion combines aspects of
interacting with others on the one hand and dominance or potency on the other (Hough et al.,
1998), it is the dominance and potency facet of extraversion that relates to leading/deciding and
interacting/presenting competencies (Bartram, 2005). Extraversion is related to arousal levels
and H. J. Eysenck (1967) has long held that extraverts are likely to experience more positive
affect. Moreover, M. Eysenck (1987) suggested that extraversion represents susceptibility to positive affect (see, also, H. J. Eysenck and M. Eysenck, 1985) and consequently the availability of attentional resources (Austin & Klein, 1996).

In this regard, Kanfer and Ackerman (2005) refer to a ‘social trait complex’ that appears to include social potency, social self-confidence, forcefulness, ambition and energy to enable managers to take charge, overcome obstacles and act decisively, all of which are facilitative or impeding of the acquisition of social influence-specific knowledge and skills (see, for example, Hogan, 2005; Hogan & Hogan, 1995, 2002; Holland, Hogan, & Van Landuyt, 2002). These arguments, thus, support the value of compound personality traits as more useful than global, decontextualized traits in the prediction of performance (see, for instance, Ones, Viswesvaran, & Dilchert, 2005b).

Social skills

Social skills is a broad, higher-order construct that reflects a number of distinctive manifestations of social understanding and competence which account for performance in occupations where a significant portion of the job involves interacting with others, particularly when that interaction is focused on influencing others and obtaining status and power (Bartram, 2005; Hogan, Kaiser, & DeVries, 2005; Schwarzwald, Koslowsky, & Ochana-Levin, 2004; Semadar et al., 2006; Wayne et al., 1997). Political and negotiation skills, for example, are not based on single traits or skills, but are a characteristic manner of expression and ability to influence others to act in ways to enhance one’s personal and/or organizational objectives (Ferris et al., 2005; Ferris, et al., 2007; Sullivan et al., 2003).

Confidence

Confidence represents another major variable in individual differences related to decision making (Ferrari, 2001; Ferrari & Dovidio, 2001; Papadakis, 2006; Russell, 2001; Zaccaro, 2001). Confidence is a relatively stable individual disposition to meet challenging task demands in a wide variety of situations and is distinct from the malleable, task-specific self-efficacy belief of individuals (Bandura, 1997). Confidence, thus, basically reflects generalized self-efficacy beliefs (see, for example, Chen, Gully, & Eden, 2004; Chen, Gully, Whiteman, &
Kilcullen, 2000). Confidence relates to individuals’ willingness to take risk. Individuals accept risk more often when they perceive themselves to be competent than when they do not (Haleblian et al., 2004). Thus, social skills deficits may not merely reflect deficient knowledge (i.e., a capacity).

Hill (1989) observes that dysfunctional cognitions affect the willingness to display social skills. Treadway, Hochwarter, Kacmar, and Ferris (2005) argue that personal volition (i.e., allocation of attentional resources) explains the enactment of social behaviour. In this regard, Bandura (1997, p. 2) explains that “people's level of motivation, affective states, and actions are based more on what they believe than on what is objectively true”. Social interaction and influence to initiate and maintain interpersonal relationships are closely related to self-efficacy beliefs (see, for example, Ferris et al., 1999; Smith & Betz, 2000; Xie, 2007) and individuals may not wish to influence others (i.e., an unwillingness to do so) in spite of knowing what is required to influence decisions. Self-efficacy beliefs moderate the effect of situational social influence variables (i.e., accountability to others) and susceptibility to social influence. Socially efficacious individuals are less likely to yield to the influence of others (e.g., Lucas et al., 2006), whereas individuals with insufficient confidence in their social efficacy tend to shy away from assuming responsibilities that entail decision making (e.g., Mirels, Greblo, & Dean, 2002). Such dysfunctional cognitions consequently inhibit social behavioural responses (e.g., cognitive withdrawal and unwillingness to deploy their attentional resources) (Stevens & Gist, 1997) and thus prevent the demonstration of social skills irrespective of social skills knowledge.

In this regard, Forgas and Laham (2005) observe that individuals with less confidence view risky interpersonal endeavours (for example, requests and negotiation) as potential threats to be approached in such a way as to maximize compliance without risking giving offense. Managers who are self-confident, conversely, select more rational modes of influence (Wayne et al., 1997). Overconfidence, on the other hand, is a common and relatively robust phenomenon in decision making (Hiller & Hambrick, 2005) and refers to the failure to know the limits of one’s knowledge or ability (Simon, Houghton, & Aquino, 1999). Overconfidence in one's own abilities is a form of cognitive conceit according to Dawes (1976) which implies a withdrawal of cognitive effort (i.e., minimization of effort) (Stone, 1994; Vancouver, Thompson, Tischner, & Putka, 2002). Individuals with unwarranted confidence may undertake
tasks beyond their abilities, underutilize available assistance, and neglect signs that decisions are going awry (see, for example, Malmendier & Tate, 2002; Moore, 2007; Tasa & Whyte, 2005; Vecchio, 2002; Wong, 2005)

There is an array of personality variables that account for overconfidence in the correctness of one's decisions and Wolfe and Grosch (1990) list individual-differences in affect (including optimism), social cognition (i.e., need for cognition, self-monitoring, self-efficacy), and cognitive ability. The combination of these factors makes managers believe they possess valuable personal insights or an understanding of their situations and available alternatives, such that they do not feel the need to exhaustively gather, analyze, and discuss data (Hayward & Hambrick, 1997).

Individuals who believe they are better than average are more likely to be overconfident in their assessments of ability (Larrick, Burson, & Soll, 2007). This may lead them to engage in tasks for which they are ill equipped or to persist in strategies that are no longer effective (Audia, Locke, & Smith, 2000; Bandura & Locke, 2003). Such unwarranted confidence may lead individuals to overestimate their ability to produce success and, consequently, neglect signs that decisions are likely to fail (Kroll et al., 2000; Malmendier & Tate, 2002; Schmidt & Calantone, 2002; Wong, 2005; Wong, Yik, & Kwong, 2006). In addition, overconfident managers tend to inflate positive outcomes and pay attention to positive feedback but ignore negative feedback. This cognitive bias (e.g., Simon et al., 1999; Vecchio, 2002) in combination with organizational pressures leads managers to make overly optimistic forecasts in analyzing proposals for major investments (see, for example, McNamara & Bromiley, 1997; Sutcliffe & McNamara, 2001). By exaggerating the likely benefits of a decision and ignoring the potential pitfalls, managers lead their organizations into initiatives that are doomed to fall well short of expectations. For example, Bond, Carlson, Meloy, Russo, and Tanner (2007) observe that individuals form an initial assessment of favourability toward a choice option and then bias their evaluation of subsequent information to cohere with their initial disposition when faced with a single option (i.e., a systematic and non-normative misinterpretation of new information). Consequently, commitments to a losing course of action are mediated by overconfidence. Overconfident individuals perceive less risk in their decisions by overestimating their ability to produce successes that contribute to escalation and entrapments in major decisions.
When such overconfidence leads to failure, it is colloquially referred to as ‘hubris’ (Hayward & Hambrick, 1997; Hiller & Hambrick, 2005). Confident that they could succeed where others had failed potentially distorts individuals’ estimation of the problems associated with their decisions. The familiar prototypical examples of leaders who rose from humble origins to great power and ultimate ruin because of their hubris are Napoleon and Hitler. In these and other instances (Certo et al., 2008; Lovallo & Kahneman, 2003) overconfidence led to a series of early successes, but eventually led to a disregard of warning signs of impending failure (Kroll, Toombs, & Wright, 2000). It is axiomatic to say that one major function of social influence interpersonal interactions is to achieve social influence (Vohs & Ciarocco, 2004). Analyses of influence attempts show that influence tactics can be split into two different types: alpha attempts (which involve boosting approach forces) and omega attempts (which involve reducing opposition). Omega strategies suggest that self-regulation may be involved in combating other’s attempts to influence. One line of research demonstrates that self regulation as guided by the self-regulatory resource model, is a central determinant of an individual’s ability to defend against others’ attempts to persuade.

For the purposes of this thesis, social self-confidence is conceptualized as intra-individual consistent propensities to behave in some identifiable way (i.e., as expressing a given trait) (Tett & Guterman, 2000) as an expression of personality in a socially adaptive fashion (Mayer, 2005). Social self-confidence is related to arousal levels, the availability of attentional resources (Austin & Klein, 1996), and positive affectivity (see, for example, H. J. Eysenck, 1967 and M. Eysenck, 1987; H. J. Eysenck & M. Eysenck, 1985). Further, operationalized as the level of surgency (the degree of impact and forcefulness) and the availability of attentional resources (energy) this trait cluster gives rise to both intra-individual variations in affective states and inter-individual differences in emotionality that represents a "preparedness to respond" (Tellegen, 1985, p. 697). The trait cluster is manifested in resourcefulness, decisiveness, dominance, independence, social presence and energy to act decisively and influence others. This positive emotionality promotes more behavioural responsiveness to positive affective states (Judge, Scott, & Illies, 2006; Tett & Burnett, 2003).

Successful performance is often as much a matter of perceived efficacy as of capabilities and any skill is only as good as its execution. Confidence, effort, and persistence are often more potent than innate ability (Dweck, 2000) and individuals therefore may perform
poorly, adequately, or highly with the same set of skills depending on the beliefs they hold about their capabilities in given situations (Bandura, 1997). Beliefs in self-efficacy are accorded a prominent role in the present thesis since they account for the allocation of the shareable attentional resources to serve on-task decision strategies in MDM and the regulation of affective reactions. The functional relationship between distal individual variable factors and the quality of MDM processes and outcomes may thus vary depending on the relative magnitude of beliefs in efficacy as a main determinant of attentional resources allocation and intentions. Space does not permit an exhaustive review of the literature on self-efficacy beliefs and an abbreviated summary of the major theoretical issues central to this thesis is provided in the section that follows.

**Self-Efficacy Beliefs**

*Definition*

In colloquial terms, self-efficacy beliefs are frequently referred to as the ‘self-confidence’ to perform a specific task at a certain level of competence. Although conceptually similar to self-efficacy beliefs, Bandura (1997) states that self-confidence (as a trait) is a nondescript term that refers to the strength of a belief but does not necessarily specify what the certainty is about. As a term, self-confidence is not a construct embedded in a theoretical system that specifies its determinants, mediating processes, and multiple effects. Another surrogate term for self-efficacy beliefs is self-esteem. Self-esteem usually is considered to be a global affective trait that reflects an individual's characteristic affective evaluation of the self (e.g., feelings of self-worth or self-liking) across a wide variety of situations (Chen, Gully, & Eden, 2004; Judge, Erez, Bono, & Thoresen, 2002; Judge, Locke, & Durham, 1997).

By contrast, self-efficacy beliefs are judgments about task or domain-specific capabilities that are not inherently evaluative (Gist & Mitchell, 1992). Self-efficacy beliefs represent individuals’ momentary belief in their capabilities to perform a specific task at a specific level of performance, that is a judgment about the likelihood of successful performance measured immediately before any effort is expended on a task (Bandura, 1997). Consequently, self-efficacy beliefs are narrow in scope and much more variable than more enduring personality traits (Gardner & Pierce, 1998). To conclude, the essential distinction between self-efficacy beliefs and similar constructs lies in the fact that self-efficacy beliefs imply an internal
attribution, they are prospective, that is referring to future behaviours, and they are an operative construct which means that this cognition is quite proximal to critical behaviour and thus a good predictor of that actual behaviour.

Defined as “beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments” (Bandura, 1997, p. 3), self-efficacy beliefs represent an individual-in-context appraisal. This appraisal constitutes a comprehensive state-based judgment of individual and context-specific capabilities (Bandura, 1997; Cervone, Mor, Orom, Shadel, & Scott, 2004; Stajkovic, 2006). Bandura’s definition of self-efficacy includes "organize and execute courses of action," which represents the theory's more specific and situational view of perceived competence in terms of including the behavioural actions or cognitive skills that are necessary for competent performance (Bandura, 1997; Cervone, 2000, 2005; Moritz, Feltz, Fahrbach, & Mack, 2000; Shea & Howell; 2000; Stajkovic, 2006; Weigand & Stockham, 2000).

The underlying premise of self-efficacy beliefs is the self-regulation of behaviour through four efficacy-activated processes that include cognitive, affective, motivational and selective processes (Bandura, 1997). These beliefs influence how a challenge is cognitively evaluated and determine how much effort individuals will expend and how long they will persevere when confronting obstacles. In addition, self-efficacy beliefs influence individuals’ thought patterns and emotional reactions and determine how resilient they will be in the face of adverse situations. The illustration in Figure 2.2 outlines the multidimensionality and the mediating processes of self-efficacy beliefs.
Beliefs in efficacy affect individuals and their performance in two ways: one is through its influence on motivation (i.e., effort and goals); the other is through its influence on affect (Bandura, 1997). It was pointed out that goals are a theory of ability and are, consequently, deeply connected to the self (Carver & Scheier, 2005). Self-efficacy beliefs and personal goals enhance motivation that lead individuals to expend greater effort and to persist longer in the face of failure (e.g., Khan & Nauta, 2001; Nel, 2007) to attain their goals (Bandura & Locke, 2003). A perceived lack of ability therefore mitigates the effects of goals on individual performance (Latham & Brown, 2006; Locke & Latham, 2002). Beliefs in personal efficacy are thus important to the extent that they may lead to an “efficacy-difficulty effect” (Lucas et al., 2006, p. 62) and act as a threshold variable that determines whether an individual chooses to engage (i.e., deploy attentional resources) in a task (Kanfer & Ackerman, 2005). Consequently, self-beliefs in efficacy motivate individuals by influencing the challenges they choose to undertake (Bandura, 2004, 2006; Bandura & Locke, 2003; Brown, Jones, & Leigh, 2005; Cervone et al., 2004). Bandura (1997) notes in this regard that individuals tend to avoid tasks and situations they believe exceed their capabilities, but they take on tasks and activities that they believe they can handle (see, for example, Hu et al., 2007).

Goals affect motivation in part through self-evaluative feedback in order to assess personal competence (e.g., Bandura & Jourden, 1991; Bandura & Locke, 2003; Cervone, Jiwani, & Wood, 1991; Latham & Brown, 2006; Locke & Latham, 2002). Affect is thus a
function of one’s actions and the subsequent outcomes (Locke & Latham, 2002) and the goals individuals pursue create the framework within which they interpret and react to events. From this line of reasoning, individuals' implicit theories of ability influence the goals they pursue which, in turn, differentially influence the manner in which they interpret and respond to task difficulty and failure.

Self-efficacy beliefs also play a pivotal role in the self-regulation of affective states and are powerful determinants of the type and intensity of affect (Bandura, 1997). Beliefs in one’s competence can create attentional biases in how events are construed that can transform the environment in ways that alter its affective potential. A useful analogy is to view such beliefs in self-efficacy as affective currency. Just as affluent individuals are better able to process information about a very expensive product they desire, individuals with a resilient level of self-efficacy beliefs may feel less intimidated at the prospect of processing negative self-relevant information (Raghunathan & Trope, 2002).

Earlier in the chapter it was pointed out that affect reflects differences in managers’ active appraisals in MDM. In summary, managers with low self-efficacy beliefs tend to appraise MDM demands as more formidable than they really are, focus more on personal deficiencies and possible adverse decision outcomes and, consequently, suffer frequent and debilitating self-doubt about capabilities they possess. This perceived lack of control leads to affective arousal and intrusive thinking that diverts attentional resources away from how best to proceed, to concerns over personal deficiencies and possible adverse outcomes. Managers with a firm belief in their self-efficacy shift their attention to task-relevant problem-focused strategies (i.e., they figure out ways of exercising some measure of control in their environments), and through ingenuity and perseverance, such managers realize experiences of success which, in turn, provide behavioural validation of personal efficacy and environmental controllability (Bandura, 1991).

MDM makes heavy attentional demands that generate affective outcomes as by-products of the decisional process. The presence of such coexisting affect represents an additional element to consider that competes with attentional resource allocation. The next section of the chapter points out that the presence of decision-generated affect can undermine persistence to stay focused on the relevant information to facilitate MDM processes and outcomes.
Decision-Generated Affect

The unique demands of information overload, experienced time constraints and meeting the interests of divergent interest groups are the very conditions that make managers vulnerable to the volition-undermining potential of decision-generated affect precisely when they are feeling over-extended to deal with such demands (Ganster, 2005; Hambrick, 2007; Hambrick et al., 2005a, 2005b). Effective MDM involves more than applying a set of individual abilities to generate desired solutions and is not a dispassionate process. As agents of decisions managers face numerous obstacles, failures, and setbacks that often carry perturbing self-evaluative implications as well as social consequences that undermine their self-evaluations in ways that impair good use of their decision making skills (Bandura, 1997).

The existence and ubiquitous nature of decision-generated affect is of considerable interest in its own right for any comprehensive understanding of MDM (see Lord & Kanfer, 2002, for a review). The role of affect as a source of information has been largely ignored since economists as well as psychologists have mainly focused on cognitive constraints while neglecting to integrate the growing body of research on emotion which indicates that reason and emotion are interconnected (Hanoch, 2002). This subsection of the chapter outlines a general overview of decision-generated affect in MDM (as illustrated in Figure 2.1). Several authors use different definitions to refer to the constructs of emotions, feelings, mood and affect. These constructs are clarified for the purpose of this thesis. The informational value and functions of affect in MDM are subsequently presented and reference is also made to the attentional-resource-demanding aspects of affect.

Definition of Terms

“All manner of distinctions have been made in an attempt to bring order to the ‘conceptual and definitional chaos’ (Buck, 1990, p. 330) that characterizes affect research. Even then there is little general agreement about how to best define terms such as emotions, feelings, mood and affect (Baumeister, DeWall, & Zhang 2007; Beal et al., 2005; Forgas, 2003; Gasper & Isbell, 2007; Izard, 2009; Pfister & Böhm, 2008; Winkielman & Truijillo, 2007).

Discrete emotions and mood, as prototypical affective constructs, are experiential states or outcomes that vary meaningfully within individuals (Baumeister et al., 2007; Brief & Weiss,
Mayer, Roberts, and Barsade (2008) define emotions as an integrated affective state involving physiological changes, motor-preparedness, cognitions about action, and inner experiences that emerge as outcomes from an appraisal of the self or situation. Bandura (1997, p. 22) asserts that there are three forms of positive affect as outcomes: a physical form such as “pleasant sensory experiences and physical pleasures”, a social form such as “social recognition, monetary, and conferral of status and power”, and a self-evaluative form such as “self-satisfaction and a sense of pride and self-worth”. Clore and Huntsinger (2007) argue that affect reflects representations of personal value (i.e., the goodness or badness of things) and that such representations can be neurological, physiological, experiential, cognitive, expressive and behavioural, among others.

Decision-generated affect is defined by Luce (2005) as affect elicited by the perception that there is a meaningful decision to be made. For the purposes of this thesis, the term ‘decision-generated affect’ is adopted to refer to a broad construct that encompasses subjective emotions, moods, and evaluations when individuals are required to resolve multiple, viable, competing options that require them to prioritize some goal(s) over another (others). Earlier it was noted that individuals’ ongoing appraisal-generated cognitive representations give rise to positive or negative affect in situations that matter to them (Raghunathan & Pham, 1999). Simply put, decision-generated affect calculates the nature of decisional outcomes where positive affect represents positive outcomes and negative affect signifies negative outcomes (Baumeister et al., 2007).

The affective outcomes generated by decisions are proposed by several authors to be multidimensional in nature (Baumeister et al., 2007; Han et al., 2007; Loewenstein & Lerner, 2003; Pham, 2007). Affective arousal ranges from rapid, simple positive or negative evaluative reactions toward external situational demands (i.e., they operate in the foreground where they attract attention), to slow, transitory, mild, and diffuse positive or negative affective states that are not directed at a specific target. Whilst somewhat arbitrary, the former refers to emotions, that is, intense, short-lived and usually having a definite cause and clear cognitive content whilst the latter refers to moods, that is, low-intensity and relatively enduring affective states with no immediately salient antecedent cause with little cognitive content (Forgas, 1991, 2000a).
Decision-generated affect is conceptualized as both (1) an immediate, rapid and automatic (i.e., proximal) affective outcome experienced at the time of decision making, and (2) as an anticipated (i.e., distal) affect that consists of predictions or forecasts about the affective consequences of decision outcomes (see, for instance, Loewenstein & Lerner, 2003). Moreover, Loewenstein and Lerner construe affect temporally according to when it occurs in the decision process, beginning with the deliberation phase that leads to a decision, implementing the decision, and, eventually, experiencing the outcomes. Although interrelated and coordinated, immediate and anticipated affect operate in different ways because they serve different functions (see, for instance, Baumeister et al., 2007). The dual outcomes of affect are presented in Table 2.1 and are described in the subsections that follow.

Table 2.1 Dual Outcomes of Decision-Generated Affect

<table>
<thead>
<tr>
<th></th>
<th>Immediate affect</th>
<th>Anticipated affect</th>
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<tbody>
<tr>
<td>Definition</td>
<td>Affect experienced during decision making</td>
<td>Predictions about how one will feel if certain decision outcomes occur</td>
</tr>
<tr>
<td>Time when affect occurs</td>
<td>Present at time of decision</td>
<td>Future: when decision outcomes are experienced</td>
</tr>
<tr>
<td>Potential benefits associated with incorporating affect</td>
<td>Prioritizing information processing and introducing important, but intangible considerations</td>
<td>Determination of optimal course of action to maximize long-term well-being</td>
</tr>
<tr>
<td>Potential pitfalls associated with incorporating affect</td>
<td>Can propel behaviour in directions that are counter to self-interest</td>
<td>When expectations are biased (e.g., forecasting errors), decision making will be commensurately biased</td>
</tr>
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Immediate affect

Affect serves as embodied information about an individual’s immediate concerns and provides important inputs into decision making that are fast enough to guide behaviour immediately (Schwarz & Clore, 2003, 2006) in order to make choices to increase the likelihood of experiencing positive affect (Baumeister et al., 2007). Such immediate affect carries specific ‘action’ tendencies (i.e., affect-relieving actions) that shift individual priorities toward immediate improvement in positively valued affect and that save attentional resources (Luce, 1998, 2005, Luce et al., 2001).
There is no simple answer to the question of whether immediate negative or positive affect is helpful or harmful for decision making. Affective reactions are not all equal because individuals experiencing them will draw different inferences from their affective experiences (Bhattacharjee & Moreno, 2002; Raghunathan, Pham, & Corfman, 2006; Seo & Barrett, 2007). For example, negative affect may relate positively to effort, but if the negative affect persists, it may signal that things will not improve despite greater efforts and evoke intentions to disengage from actions (see, for example, Foo et al., 2009). How affect is construed may also cause decrements in decision making that force shifts in attentional resource allocations to an off-task focus and dilute the comprehensiveness of decision processes (Payne & Bettman, 2007) or function as an incentive to allocate attentional resources in order to pursue an accuracy goal rather than to minimize the effort (Arenas, Tabernero, & Briones, 2006; Maule, Hockey, & Bdzola, 2000).

For the purpose of this study, immediate affect is conceptualized as the immediate proximal affective arousal experienced at the time of decision making in response to making decisions. Immediate affect operates as an important source of information that disrupts on-task effort allocation and redirects attentional resources from the decision process to the affective experience. How these affective traces (inclusive of subjective experience and physiological arousal) are construed may lead managers to approach decision making with anxiety and the experience of such disruptive arousal lowers managers’ self-beliefs in their ability to perform skillfully (Bandura, 1997).

Anticipated affect

Anticipated affect reflects cognitive forecasts about anticipated affective consequences of decisions. Anticipated affect impacts on the content of thoughts that come to mind rather than the immediate experience of affect (Schwarz & Clore, 2006) and influences the assessment of decision alternatives (i.e., it serves a directional role) (Baumeister, Vohs, DeWall, & Zhang, 2007). Anticipated affect thus serves as a cue to weigh up the pros and cons of various decision alternatives and to form an affective ‘shortcut’ or ‘affect heuristic’, especially when the decision is ambiguous, complex or attentional resources are limited (Finucane, Peters, & Slovic, 2003). Moreover, Finucane, Alhakami, Slovic, and Johnson (2000)
point out that using an overall, readily available affective impression can be far easier and more efficient than comprehensive deliberation (i.e., an accuracy goal) under time pressure.

Actions are pre-shaped in thought and individuals anticipate either optimistic or pessimistic scenarios in line with their level of self-efficacy beliefs according to Ajzen (2002). It is thus partly on the basis of anticipated affect in succeeding (i.e., based on efficacy beliefs) that individuals choose which goal challenges to undertake, how much effort to invest and how long they persevere in the face of difficulties (Bandura, 1997). Anticipated affect, consequently, prepares individuals for the future (Mellers et al., 1999).

A major source of human motivation is cognitively generated and individuals anticipate likely outcomes of prospective actions in order to guide and motivate their efforts (Bandura, 2004). Frisch and Clemen (1994) argue that a component of a good decision is that one should try to accurately anticipate the different possible consequences of one's actions. To anticipate the consequences of one's actions accurately, one must predict both what consequences will (or might) occur and how one will experience the different possible consequences. This ability to bring anticipated outcomes to bear on current activities promotes purposeful and foresightful behaviour and, when projected over a long time on matters of value, a forethoughtful perspective provides direction, coherence, and meaning to one's life (Bandura, 2006).

Individuals, consequently, pursue courses of action that produce positive self-reactions and affect (Baumeister et al., 2007). For example, individuals tend to choose situations in which they anticipate high personal control but avoid situations in which they anticipate low control (Wood & Bandura, 1989b). In addition, when thinking about what actions to take, managers anticipate the results of their actions through predictive forethought and evaluate the adequacy of their actions by analyzing the effects of their actions (Wood et al., 1990). Self-beliefs in efficacy, goals, and expectations are consequently all reflections of individuals pursuing affect. The beneficial value of anticipated affect on goal pursuit motivates individuals to try harder to pursue such goals and these motivated efforts, in turn, facilitate reaching one’s goals. Janis and Mann (1977) propose that anticipated affect accounts for greater vigilance and information gathering (i.e., systematic-comprehensive decision processes) that lead to better choices.

Some factors, however, limit the efficacy of decision making based on expected affect. Individuals systematically mis-predict their own affective reactions to outcomes of their own
decisions (Carstensen & Hartel, 2007). Although individuals are generally accurate in making predictions about the valence of future affective experiences, they are not always accurate at predicting the intensity and duration of the actual affective experience. Individuals may consequently be systematically biased when it comes to predicting affective outcomes and they may overestimate the enduring effect that future events will have on their wellbeing. In regard to this, Loewenstein and Lerner (2003, p. 626) note:

Such mis-predictions may constitute a major source of sub-optimality in decision making ... Many, if not most, of the consequences of decisions occur in the future, when the emotions an individual experiences may be different from those that prevailed when the decision was made.

Consequently, the degree of latitude in how individuals interpret future outcomes makes anticipated affect a treacherous guide (S. L. Williams, 1995). Moreover, anticipated affect is especially noteworthy in the escalation of commitment to prior decisions. For example, managers are unwilling to incur loss (i.e., they avoid the feelings of failure), so much so that they often make irrational decisions based on a small probability that they could avoid such loss (Schmidt & Calantone, 2002; Wong, 2005; Wong et al., 2006).

A review by Anderson (2003) concludes that a great deal of inaction stems from anticipated or feared affective outcomes. Anticipated affect can motivate decision-avoidant behaviours such as refusing to make any decision (Anderson, 2003), status quo bias (Luce, 1998), or allowing others to make the decision (i.e., minimizing justification). Avoidance or deferral of decisions, consequently, serves as an attempt to circumvent the anticipated affective consequence of potential failure, as long as individuals believe that avoidance makes them feel better (see Baumeister et al., 2007; Schwarz & Clore, 2006).

Anticipated affect is especially relevant in social comparison. The negative consequences of managerial decisions are not easily avoidable in a competitively structured business world because of the prevalence of forced social comparisons (e.g., industry performance, board reviews). Organizations promote competition due to their focus on, and rewarding of, individual accomplishments that encourage social comparisons. Consequently, managers are continually confronted with comparative appraisals whether they seek them or not (Bandura & Jourden, 1991). How managers are perceived and evaluated by their superiors
and peers has considerable consequences in terms of their reputation (Tsui & Ashford, 1994) and the potential effects of a loss of peer acceptance or a reduction in self-esteem tend to invite strong self-evaluative reactions. As a result, managers may pursue choices that minimize the demoralizing effects of adverse social comparison (Bandura, 1997). Anticipated affect for the purpose of this study is regarded as attempts to regulate future affective outcomes rather than the immediate experience of affect itself. In this study, anticipated affect is represented by self-evaluative and social comparative concerns about personal competence, vulnerability and control over decision outcomes.

Earlier it was pointed out that the decision context forces managers to deal with two problems: the cognitive problem of making a good decision under pressure of time and ambiguity; and achieving this against a background of divergent political interests (i.e., to maximize the ease in obtaining information, resources and influencing others). Moreover, managers will devote more effort (i.e., allocate attentional resources) to exploring and deliberating during their decision processes when they believe it will help them attain their individual and organizational goals. These decision processes are however modified by affect minimization concerns that can disrupt attentional resource allocation in the prediction of the quality of MDM processes and outcomes.

In conclusion, considerations regarding decision-generated affect are critical in MDM by virtue of their informational and motivational value. Affect in fact serves as a ‘common currency’ in making decisions to allow individuals to compare the affective outcomes associated with different options (Peters, Västfjäll, Garling, & Slovic, 2006). Using disparate types of affective rewards in a kind of internal common affective scale enables individuals to utilize positive and negative affect rather than opting for less deliberation and effort in order to avoid decisions. Moreover, in many decisions affect may indeed be the most useful and only information individuals have (Raghunathan & Pham, 1999). Managers with a strong ability to regulate affective influence are able to modulate their affective response tendencies by effortful or controlled processes (via self-efficacy beliefs) and are thus able to balance affective information processing with deliberative analysis in MDM.

Any theory of MDM cannot be based on making decisions alone but also needs to take into account the decision not to act as well. The decision not to act has largely been ignored in MDM research, though aspects of not choosing constitute a useful contribution towards
understanding the decision making of managers. The next subsection deals with the volitional transformation of decision-generated affect into decision behaviours.

**Allocation of Attentional Resources**

Escapist thoughts, as a form of cognitive interference, redirect attentional resources (cognitive effort) from the decision process task to the affective experience and, consequently, keep individuals away from investing more effort and persistence which leads to premature disengagement from tasks (Carver & Scheier, 2005; Foo et al., 2009). Such thought and emotional interference disrupts on-task attentional effort allocations that compete with available and limited attentional resources (Beal et al., 2005; DeShon et al., 1996; Kanfer & Ackerman, 1996; Weiss et al., 2005).

Schwarzer (1996) sees self-doubts as unfavorable thought intrusions that refer to personal deficits that direct attention to negative outcomes that limit constructive attempts to find the best possible choice. Instead of seeking a choice an individual chooses not to choose because of the difficulty in committing to the choice (Anderson, 2003). Intrusive and interfering thoughts interfere with the allocation of sufficient attention to the task and a lack of effortful attention leads to volitional inaction and disengagement from intentions. Cognitive interference thus has a volitional effect that induces individuals to avoid the opportunity-affording features of a decision and makes individuals less likely to approach the decision, as well as more likely to favour the maximization of positive affect with avoidance of decisions (Baumeister et al., 2007).

**Decisional procrastination**

Several authors express the opinion that avoidant and decisional procrastination is a result of proximal motivational-affective self-regulation (see Ferrari & Pychyl, 2007; Renn, Allen, Fedor, & Davis, 2005; Steel, 2007; van Eerde, 2000). Volitional inaction is a type of psychological inertia that provides an affective incentive to circumvent the affective consequence of failure. Consequently, the allure of inaction attracts individuals away from the aversive nature of the consequences of decisions because the anticipated affective outcome holds promise of feeling better (Baumeister et al., 2007; Schwarz & Clore, 2003). It has been
pointed out that managers make strong external attributions to subjectively experienced decision difficulty and that hesitation to act on intentions about conflicting alternatives creates a situation in which they never have to put their abilities to the test. Individuals’ cognitive evaluations of themselves (i.e., implicit theory of ability) is an underlying disposition which influences their affective responses to situations. Such cognitive frameworks determine self-conceptions of ability (Dweck, 2006; Dweck & Molden, 2005; Elliot & Dweck, 2005). Individuals with a fixed ability and performance validation goal produce a bias in the evaluations of performance in order to demonstrate and validate this competence by proving performance (i.e., a preference to demonstrate and validate one's competence by seeking favourable judgments). Such a fixed self-conception of ability evokes a performance-avoidance goal-orientation (i.e., a preference to avoid negative judgments about one's ability from others). Performance-oriented individuals are more susceptible to the effects of negative affect, prefer normative standards to evaluate their level of task mastery and are consequently less efficacious in adapting to novel challenges (Bandura, 1997; Bandura & Jourden, 1991; Gerhardt & Brown, 2006). Such a perceived lack of ability therefore lessens the effects of goals on individual performance (Latham & Brown, 2006; Locke, & Latham, 2002) and as such individuals tend to avoid tasks and situations they believe exceed their capabilities and take on tasks and activities that they believe they can handle (Bandura, 1997; Hu et al., 2007).

Shifting responsibility, buck-passing and bolstering behaviours are of specific interest within MDM as examples of individuals’ avoidance and attempts to limit information gathering by getting others to make choices and take responsibility for decision consequences on their behalf (see, for example, Green et al., 2000; Lerner & Tetlock, 2003). For example, escape occurs when an individual leaves the decision context entirely. Luce (1998) noted that trade-off choices generated negative affect that caused individuals to try to escape from the dilemma, often by means of premature closure and ending the decision process before all the relevant information had been examined (Cheng 2003). Eisenhardt (1989) introduced the term quick closure as an impulsive, hasty or simplified choice that is based on a failure to differentiate between information that is relevant or irrelevant, reliable or unreliable, supportive or non-supportive to the interests of both individual and organizational goals. Janis and Mann (1977) illustrated that hypervigilance (quick closure) occurred as a result of individuals’ overreacting
to impending threat by taking impulsive, ill-considered action when in conditions characterized by informational overload and lack of time to search and deliberate.

Persistence is a feature of situational purposive behaviour (Meier & Albrecht, 2003) and is defined as the voluntary and enduring continuation of a goal-directed action in spite of obstacles, difficulties, or discouragement (Peterson & Seligman, 2004). To accomplish their goals individuals need continued engagement with goals (Carver & Scheier, 2005) and individuals who judge that they can solve problems persist because it is worth expending time and energy on solvable problems (Bandura, 1995, 1997; Bandura & Locke, 2003; Khan & Nauta, 2001; Lucas et al., 2006; Nel, 2007; O'Connor & Arnold, 2001). Persistence in the face of failure is relatively difficult and individuals are often inclined to give up and turn their attention elsewhere. Moreover, individuals who distrust their capabilities reduce their efforts (attentional resources) or abort their attempts prematurely irrespective of their actual ability (see, for example, Phillips & Gully, 1997) and give up quickly because there is no point in persisting on tasks that are judged to be beyond their capability (Cervone & Peake, 1986). Volitional persistence parallels effort (attentional resources allocation) as well as how long managers sustain this effort when confronted with ambiguity, opposition and obstacles in MDM in the service of their goals and interests of the organization.

Intentional inactivity, consequently, reflects a desire to distance oneself from challenging tasks and independence in decision making that serves as a protective response in order to prevent disclosure of perceived inabilities and incompetence (Cheng 2003; Mirels et al., 2002). Such avoidance of challenges (especially in the face of failure) and the tendency to seek tasks on which success is likely reflect emotion-focused coping in order to induce positive feelings (see, for example, Brown, Westbrook, & Challagalla, 2005; Carver, 2004) and regulate attentional resources (DeShon & Gillespie, 2005; Finkel, et al., 2006; Tice, Baumeister, Shmueli, & Muraven, 2007; Vohs & Baumeister, 2004; Vohs, et al., 2008).

In this regard, Luce (2005) argues that making decisions can be thought of as confronting conflict (i.e., seeking choices) or as avoiding conflict (i.e., choice averse) in decision making (see also Svenson, 2003). Making decisions, thus, can be conceptualized as cognitive and behavioural efforts to cope with specific external and/or internal demands that are appraised as taxing or exceeding the resources of individuals (see, for example, Hu et al., 2007). Effective coping enables individuals to resolve problems, relieve emotional distress, and
stay on track toward achieving their goals (i.e., achieving a satisfying state of affairs) (Brown et al., 2005). Thus, individuals may either choose to engage in adaptive behavioural patterns, such as selecting challenging tasks, setting difficult goals, and persisting when obstacles are encountered or, conversely, they might choose to avoid challenging tasks, set low goals, and choose to engage in self-handicapping behaviour when difficulties are encountered (DeShon & Gillespie, 2005). Individual attempts to cope with decision conflicts can thus either be adaptive or non-adaptive, as suggested by Janis and Mann’s (1977) conflict model of decision making. Consequently, coping responses can range from dealing with problems directly (task-orientation or problem-focused) to avoiding them altogether (i.e., emotion-focused) (Bettman, Luce, & Payne, 1998).

Emotion-focused coping to minimize affect (Luce, 1998) also serves as a protective strategy in order to avoid negative comparison from others. Consequently, individuals avoid task performance in order to preserve the status quo of social approval and to avoid being negatively judged by others (Skaalvik, 1997). Minimizing affect is especially relevant in the competitively structured business world because of the prevalence of accomplishments that encourage social comparisons. How managers are perceived and evaluated by their superiors and peers has considerable consequences in terms of their reputation (Tsui & Ashford, 1994) and the potential effect of a loss of peer acceptance or a reduction in self-esteem (Janis & Mann, 1977) tends to invite strong self-evaluative reactions. As a result, managers may pursue choices that minimize the demoralizing effects of adverse social comparison (Bandura, 1997).

Social comparison information operates as a primary factor in the self-appraisal of capabilities and does so in part for emotional reasons (Buunk & Gibbons, 2007; Larsen & Prizmic, 2004). Decisions in organizational life often depend on perceptions of ability that are experienced as social comparisons or as feelings of confidence. Thus good decision outcomes may elicit states such as feelings of security, pride and satisfaction, whereas poor performance may generate dissatisfaction (Bandura & Jourden, 1991; Cervone & Wood, 1995). The social construal of ability beliefs may be communicated to an individual either directly, through the comments of supervisors and colleagues, task instructions, and appraisals, or indirectly, through rewards and promotions (social incentives feedback and social incentives) (Tabernero & Wood, 1999). Consequently, managers may adopt decision strategies focused on avoiding
negative possibilities in competence to pursue a goal to avoid incompetence (Elliot & Dweck, 2005).

Overwhelming situational demands other than time limitations such as competitive activities (cognitive load conditions) and uncertain decision consequences may prompt managers to conserve their volitional attentional resources for action when an appropriate opportunity or need presents itself. Consequently, inaction may occur simply because a manager does not recognize that an opportunity has presented itself or that there is a need to make a decision. One may simply be maintaining energy for a later time rather than deliberately avoiding a decision. As pointed out earlier in the chapter, the individual capacity for volition is limited and managerial work requires initiative and decision making so frequently that it may deplete attentional resources in the individuals who hold these positions. A manager who has just made a great number of decisions is likely to be depleted and may begin to make poor decisions. Active choice-making depletes attentional resources (Schmeichel & Baumeister, 2004) and frequent decisions may exhaust attentional resources that, in turn, decrease subsequent attempts for the self-regulation of effort and affect. Consequently, managers may become progressively worse at making good decisions. This may not be due to declining motivation but can be accounted for by fatigue which disables individuals in accessing enough attentional resources necessary for effective subsequent decision making. This is discussed in the next subsection.

Decisional fatigue

Fatigue is inherently a subjective aversion to expending effort (Hockey, Maule, Clough, & Bdzola, 2000) and a shift towards a preference for activities that require less effort or limited use of high-level control actions (Hockey, 1997). As a symptom emanating from prolonged stress, fatigue reflects in the exhaustion component of occupational burnout (i.e., feelings of being overextended and depleted of one’s emotional and physical resources) (Baumeister, 2001; Maslach, Schaufeli, & Leiter, 2001). Consequently, attentional effort conservation is a strong feature of the fatigued state and rather than evoking a problem-focused choice in decision processing, decisional fatigue operates as a signal to reduce attentional resources in decision processing and choice. Thus, fatigue appears to operate more as a signal
for reducing engagement in active information-processing and it favours passive-evasion and avoidance options in decision making (Baumeister, Bratslavsky, Muraven, & Tice, 1998).

Decisional fatigue is more likely to signal a threat from a prolonged over-commitment of attentional resources that reduces effort expenditure, persistence, and task involvement (Hockey, 1997). Most managers are engaged in some aspect of decision making at any moment in any day (Brousseau et al., 2006) and they can tire of the endless demands of inter-temporal choice (i.e., decisions between consequences occurring at different points in time). Consequently, choice, to the extent that it requires greater decision making among options, can become burdensome and ultimately counterproductive (Vohs et al., 2008). There is thus a hidden cost in making frequent binary choices that may exhaust the attentional resources necessary for effective subsequent decision making (Fitzsimons & Bragh, 2004). Prolonged and frequent decision making depletes attentional resources for effective subsequent decision making (Twenge, Tice, & Baumeister, 2000; Vohs et al., 2005).

Decisional fatigue and exhaustion can alter the desirability of making choices and decrease the desirability of further increments of effort (Loewenstein, 1996). Fatigued individuals display a higher propensity to avoid risky decisions and fatigue increases in risk for more important decisions (Hockey et al., 2000). Under normal conditions, most managers display a natural bias for risk that may be overridden by an inhibitory self-regulation process after evaluation of options (i.e., attentional resources applied for a systematic-comprehensive decision process in order to achieve an accuracy goal).

Throughout this chapter it has been argued that managers devote attentional resources to a course of action in response to the subjective appraisals of the environment and to meet multiple and, at times, conflicting goals. Further, MDM is more than the mere expression of knowledge and skills in decision making. MDM is a motivated, cognitive and social process and the literature provides a strong argument for the inclusion of self-efficacy beliefs as an individual-in-context construct that reflect estimates about how attentional effort and ability will combine and the type of affect a manager will experience in response to decision demands. Moreover, MDM is inherently conditional on the independent and interactive influence of self-efficacy beliefs (via its regulation of motivation and affect) as a contributing factor in the application of individual capabilities, decision processes, concomitant decision-generated affect and fatigue as has been illustrated in Figure 2.1.
As agents for decisions in their organizations, managers’ appraisals of constraints and ambiguity can divert their goals away from effort and accuracy concerns to affective self-evaluative concerns. These affective concerns interfere with the allocation of attentional resources by diverting volition attentional resources away from exercising quality in MDM processes and outcomes. The next subsection presents MDM as a cognitive and substantive process and as the use of rational modes of social influence in order to secure resources, resolve divergent interests and counteract political pressures in order to make decisions that serve the interests of the organization.

**MDM Decision Behaviour**

The social-cognitive perspective adopted for the purposes of this study views MDM as an integrated and interactive process that is regulated extensively by the individual variable factors of the decision maker, organizational environment (i.e., task and context demands) as multiple and reciprocal determining factors (Bandura 1991). The properties of the organizational environment (i.e., accountability and social constraints, ease of access to organizational resources) and the level of challenge it prescribes represent the environmental determinants. The individual factors are indexed by distal individual ability and traits and the proximal influence of self-efficacy beliefs. The decision making processes that are selected constitute the behavioural determinant. This is illustrated in Figure 2.1. From this social-cognitive perspective, how managers appraise and interpret their environment impacts the application of effort and affect. Subsequently, how well they use the capabilities they possess is mediated by their self-efficacy beliefs. How these capabilities are used alters their environments which, in turn, informs the selection of the subsequent quality of MDM processes and outcomes. Consequently, in this conceptualization all these factors operate as interacting determinants that influence each other bidirectionally.

As agents of decisions for their organizations managers are required to deal with a dual process in their decision making as illustrated in Figure 2.1. The following subsections of the chapter discuss the temporal and evolving nature of decision making processes and outcomes as the behavioural determinant in MDM in terms of social-cognitive theory.
MDM Processes and Outcomes

Application of a systematic-comprehensive process

MDM can be conceptualized as an effortful systematic-comprehensive decision process that includes seeking and gathering information and processing the information acquired in a procedurally rational manner as well as an effortful rational mode of social influence (i.e., willingness and ease to counteract the political pressures of divergent self-interests that detract from procedurally rational decisions) in order to maximize the accuracy of decisions that serve the best interest of the organization. The following subsections provide an elaboration of this process.

Procedural Rationality

Simon (1945) states that one function that an organization performs is to place managers in a psychological environment to enable them to adapt their decisions to organizational objectives and provide them with the information needed to make these decisions correctly. Consequently, as an agent for decisions, managers need to make rational decisions that result from an appropriate process of deliberation, the duration and intensity of which are free to vary according to the perceived importance of the choice problem that presents itself.

A focal issue in MDM is thus to make a good decision that conforms to a normative process in order to yield decisions that are oriented toward organizational goals (i.e., accuracy goals). Fredrickson and Mitchell (1984) argue that a measure of rationality of the decision process is the attempt to be exhaustive or inclusive (comprehensiveness) in making decisions. Janis and Mann (1977) argue that such a comprehensive process leads individuals to process information more vigilantly. Bazerman (2006) describes, for example, a rational decision making process that includes steps such as defining the problem, identifying relevant criteria, weighting these criteria, generating alternatives, rating alternatives on each criterion, and computing the optimal decisions. Consequently, a vigilant decision-process is systematic and comprehensive (Wood et al., 2000) and based on the extensive and less selective use of information (Payne & Bettman, 2007). A systematic-comprehensive process is also referred to as motivated processing (see, for instance, Forgas et al., 2004) or System 2 (Evans, 2003, 2008;
Kahneman, 2003; Stanovich & West, 2000). Such a systematic-comprehensive decision process is a slow, effortful, logic-based process that results in decisions that are made sequentially rather than simultaneously. Moreover, the underlying assumption regarding the use of a systematic-comprehensive decision-process is that it requires a greater use of appropriate information and analysis (Kahneman, 2003) and that a greater use of such a process results in better solutions to more complex problems (Leaptrott & McDonald, 2008; Stanovich & West, 1998a, 1998b).

These conceptualizations suggest that a motivated, controlled decision process serves to decontextualize and depersonalize problems (i.e., deal with problems without social/affective content) that make the process more attuned to normative rationality. Attempts to gather information of criteria for a range of alternatives and to process the acquired information in a systematic manner is cognitively more effortful (Connolly & Ordonez, 2003) and to make good decisions one must do so accurately and thoroughly (Frisch & Clemen, 1994). Consequently, individuals make more correct, better decisions and inferences when they try extra hard (Baumeister, Heatherton, & Tice, 1994). For example, some managers can make very poor decisions, with devastating consequences for their organizations, while others in similar circumstances make better decisions (e.g., Lovallo & Kahneman, 2003; Malmendier & Tate, 2003). Such variation in decisions could not exist if constraints alone were accountable for the quality of decisions. Consequently, the way individuals make decisions may well be a function of the quality of the decision-process followed (see Shafir & LeBoeuf, 2002; Stanovich and West, 1998). The quality of the decision-process thus influences the accuracy of choices managers make and, consequently, the fortunes of their organizations (Audia et al., 2000; Goll & Rasheed, 1997; Tasa & Whyte, 2005; Wong et al., 2008).

Dean and Sharfman (1993) define procedural rationality as the extent to which the decision process involves the collection of information relevant to the decision and the reliance on analysis of this information in making decisions. The term ‘procedural’ is used to focus on the decision making process and to distinguish the construct from more global conceptions of rationality (Dean & Sharfman, 1996). For the purposes of this thesis, a systematic-comprehensive process is defined as an effortful decision process that includes seeking and gathering information of criteria for a range of alternatives and processing the information
acquired in a procedurally rational manner to maximize the accuracy of decisions that serve the best interest of the organization.

**Rational social influence**

Decision making in organizations also requires managers to exercise social persuasion (Bandura, 1997; Beach & Connolly, 2005). Managers face the political problem of resolving the divergent political and self-serving interests of individuals or groups in order to gain the compliance of others in a manner that promotes accuracy in decisions (see, for example, Ferris et al., 2007; Hochwarter et al., 2006). These covert attempts are products of compromises based on elaborate and complex social patterns of political influence and social encounters (i.e., negotiating and bargaining) in an attempt to advance interests to influence final decisions (Beach & Connolly, 2005). Consequently, a distinguishing characteristic of MDM is dealing with these dependencies and constraints. While it is theoretically possible that all of these individuals would automatically act in just the manner that a manager wants and needs, such is almost never the case in reality (Kotter, 1977; Mintzberg, 1973, 1983, 1999). Kotter (1999, p. 9) observes in this regard:

> All effective GMs (General Managers) seem to get things done with these methods, but the best performers tend to mobilize more people to get more things done, and do so using a wider range of tactics to influence people… they ask, encourage, cajole, praise, reward, demand, manipulate, and generally motivate others with great skill in face-to-face situations. They also rely more on indirect influence than do the ‘good’ managers, who tend to apply a narrower range of techniques with less finesse.

Engaging in effective social influence requires a blend of hard and soft tactics as well as the willingness and capability to demonstrate such knowledge (Hochwarter et al., 2007; Schwarzwald et al., 2004). Over two decades ago, Mintzberg (1983, p. 183) stated that managers need to possess “political will and political skill” to deal with the ambiguous and often turbulent environments of politicized organizations. Political skill is defined as the ability to effectively understand others at work and to use such knowledge to influence others to act in ways that enhance one’s personal and/or organizational objectives (Ferris et al., 2005).
Confidence to exercise social influence is manifested in socially relevant situations that reflect beliefs about social efficacy to control and exert influence in social interactions (see, for example, O'Connor & Arnold, 2001; Sullivan et al., Burris, 2005; Smith & Betz, 2000; Xie, 2007).

For the purposes of this thesis, rational social influence is perceived as a multidimensional construct that represents the willingness and ease to exercise rational and supportive modes of influence to assume independence in decisions (i.e., the readiness to make decisions) in order to advance compliance in the service of accuracy of decisions. Moreover a rational mode of social influence includes the effortful application of verbal resources to explore, gather and analyse relevant information for rational deliberation and persuasion in order to advance and influence final decisions.

To conclude, procedural rationality (i.e., the systematic-comprehensive process to make a good decision) and a rational mode of social influence (i.e., willingness and ease to counteract the political pressures of divergent self-interests that detract from procedurally rational decisions) are central to the MDM literature. These constructs are also empirically distinct as pointed out earlier in the chapter. Further, successful decision outcomes emanate from the quality of MDM processes, that is, they are positively related to a systematic-comprehensive process and negatively related to acquiescence in order to gain favours to meet the self-serving interests of dominant coalitions that are embedded in the political context. Consequently, both constructs explain how the quality of MDM processes influences managers’ contingent decision behaviour in order to accomplish their multiple goals. In addition, the quality of MDM processes affects decision accuracy through the mediating influences of attentional effort.

Throughout this chapter it has been demonstrated that MDM is a motivated, cognitive and social process that is more than the mere expression of knowledge and skills. The conceptual evidence and the links among the relevant constructs provide for a plausible explanation of how the simultaneous effects of context, managers’ cognitions, multiple goals, individual variable factors and decision-generated affect combine to impact on volitional allocation of attentional resources that in turn impact on the quality of MDM processes and outcomes (see Table 2.1). In the next subsection a conceptual model of relations is outlined as a plausible conceptualization of MDM.
An Integrative Model of MDM

Frisch and Clemen (1994) argue that discovering ways in which decisions go astray, one gains insight into psychological processes and also opportunities to improve decision making. The present researcher pointed out that psychological process models provide causal explanations for decision making regularities that emphasize the adaptive use of an abundance of decision processes. Decision process models include many variables, multiple constraints, intermediate and temporal states of the decision maker and the simultaneous, antecedent conditions that mediate decision behavior (Brousseau et al., 2006; Forgas et al., 2004; Hough & White, 2003; Lerner & Tetlock, 2003; Payne & Bettman, 2007). A conceptual model of relations is presented to reflect the constellations or potential associations of individual factors and their time-ordered influences on the allocation of attentional effort and the subsequent quality of decision processes and outcomes under highly contingent conditions.

To the researcher’s knowledge no such perspective (i.e., jointly incorporating individual ability and motivational variable factors) in the conceptual literature on MDM currently exists. Self-efficacy beliefs are afforded a prominent position in this thesis. The researcher advances the argument that self-efficacy beliefs are a proximal contributing factor in the application of distal individual variable factors (see Figure 2.1). Moreover, the influence of individual factors on the functional relationships in MDM varies depending on the level of self-efficacy beliefs. It is thus argued that MDM is inherently conditional on the proximal independent and interactive internal attributions of self-efficacy beliefs in combination with individual variable factors in the prediction of the quality of MDM processes and outcomes through temporal mediating processes (decision-generated affect and fatigue).

The conceptual model of relations in MDM is presented in Figure 2.3. This conceptual model represents a plausible explanation to reflect the constellations or potential associations of distal individual variables (cognitive ability and social-self-confidence) as time-ordered influences in the prediction of the quality of MDM processes and outcomes. The arrows in the conceptual model represent direct causal linear relationships between the distal variables (cognitive ability and social self-confidence) with decision-generated affect and the allocation of attentional resources. The curved arrows between cognitive ability and self-efficacy beliefs, social self-confidence and self-efficacy beliefs, indicate that these variables covary in their relations. Further, the direct arrow from decision-generated affect reflects a direct causal linear
relationship with allocation of attentional resources, which in turn is hypothesized to account for the quality of MDM processes and outcomes.
Appraisal of decision demands in terms of goals to pursue
Distal and proximal individual variables
Anticipated and immediate decision-generated affect
Allocation of attentional resources
MDM decision behaviour

Figure 2.3 Conceptual Model of Relations in MDM
The conceptual model of relations in Figure 2.3 illustrates the postulated ordering of causal paths from individual factors and their time-ordered influences on decision-generated affect and the subsequent engagement and allocation of attentional resources that give rise to the volitional selection of cognitively effortful information search, deliberation and rational social influence in MDM.

Summary

In this chapter it has been pointed out that individuals make decisions in order to achieve varied goals. Unlike individual decision making, MDM differs in that decisions are made as an agent for the organization. This makes MDM context-specific since managers as agents deal with decisions in contexts that are very different to those faced by individuals. Managers are required to make decisions in order to meet multiple and, at times, conflicting goals within a context of organizational constraints and great ambiguity. Their cognitive appraisals of these constraints and ambiguity alter the goals they have and, consequently, influence the quality of MDM processes and outcomes.

Moreover, as environmental time constraints and ambiguity increase, attentional resources can be diverted away from effort and accuracy concerns in decisions to affective self-evaluative concerns. Consequently, affect occupies a prominent position in this model because, not only does it interfere with the allocation of attentional resources, but it also impacts on decision processes and guides decisions in order to avoid affective concerns such as incompetence, failure, and adverse social comparisons.

In addition, MDM presents special demands that cannot be explained merely at the individual variable factor level but need to be approached with attention to the demands of the task and broader context and how these factors interact. Moreover, managers do not operate as autonomous agents nor is their decision behaviour wholly determined by contextual influences since the exercise of self-efficacy beliefs forms part of the co-determining conditions (Bandura, 2008).

Self-efficacy beliefs are a central integrating variable in MDM. These comprehensive state-based judgments of perceived individual and context-specific capabilities influence the interpretative biases of the conditions under which managers must decide and the goals they set.
for themselves. In addition, self-efficacy beliefs influence perseverant application of effort, as well as how well managers are able to balance their decision-generated affect and outcomes with deliberative analysis in MDM.

The next chapter reviews the extant research and confirmatory evidence of the importance of MDM as a multidimensional process. In addition, the review illustrates how attributions to subjectively experienced decision difficulty is influenced by individuals’ appraisals of decisional demands that influence their confidence in their abilities and the extent to which they believe they can control the decision context. Confirming evidence is presented to illustrate the contribution of distal individual variable factors in MDM, followed by a review of the evidence of the contribution of self-efficacy beliefs in the prediction of performance and of specific interest to MDM. The extant research of the antecedents and consequences of decision-generated affect on the application of attentional effort in the prediction of the quality of MDM processes and outcomes is also reviewed. Finally, there is a review of the few studies that have investigated the independent contributions of distal individual differences (cognitive ability and social self-confidence traits) in combination with proximal self-efficacy beliefs, and the concomitant mediated differences in affect on the allocation of attentional resources in the prediction of MDM processes and outcomes.
CHAPTER THREE
RESEARCH REVIEW

The previous chapter described the interactive association between contingent decision demands, goals, individual variable factors, decision-generated affect, fatigue and self-efficacy beliefs, all of which impact on the quality of MDM processes and outcomes. It was argued that managers respond affectively to the onerous aspects of consequential decisions and that decision-generated affect and fatigue redirect attentional resources from the decision process (i.e., on-task focus) to the affective experience (i.e., off-task focus). Further, it was argued that self-efficacy beliefs mediate between individual variable factors (i.e., cognitive ability and social self-confidence) by re-allocating attentional resources and affect to on-task, effortful MDM processes.

Conceptual research, however, has outpaced empirical research on MDM (Zaccaro, 2001). There are several reasons for this. First, managers as subjects are notoriously unwilling to submit themselves to research and many of the studies in the empirical review in this chapter involve predominantly North American students. Undergraduate and postgraduate business students, however, may not be ideal surrogates for managers and extant empirical research conducted using such students may thus not generalize to managers. For example, Remus (1996) compared the decision making of managers to that of graduate and undergraduate business students using a complex decision task. Although no significant differences between the managers and graduate business students were observed, undergraduate students made more costly decisions, used less effective decision strategies and were more erratic than the managers and graduate students.

Secondly, the nature of MDM does not lend itself readily to experimental analysis in actual organizational situations (Bandura, 1991, 1997; Bandura & Jourden, 1991; Critchfield & Kollins, 2001; Hodgkinson & Healey, 2008; Hough & White, 2003). Although experimental research is clearly important for the further refinement of decision-making process theories, the process of determining how consequential decisions are made in real life business contexts faces challenges not easily replicated in experimental research (Leaptrott & McDonald, 2008). There is no experimental parallel to real life business decision-making situations that permits a systematic manipulation
of interactive psychological mechanisms and patterns of influence in order to clarify and define the multiple relevant factors which combine in real life MDM (Bandura & Locke, 2003). Finally, social and ethical constraints limit the opportunities to apply experimentally designed influences in MDM in real organizations with real managers.

This research review is presented in several sections. In the first section confirmatory evidence of the importance of MDM is reviewed, as well as evidence to confirm that MDM is a multidimensional process. The review proceeds to show that individuals’ objective and subjective appraisals of decisional demands influence their confidence in their abilities and the extent to which they believe they can control the decision context. Self-efficacy beliefs are shown to mediate the interpretative biases of decisional complexity that impact on the application of attentional effort and affective outcomes. Research evidence is then presented to illustrate the contribution of distal individual variable factors in MDM, followed by a review of evidence of how individual variable factors, in combination with self-efficacy beliefs, impact on general work performance and decision making. Finally, empirical evidence is presented related to the antecedents and consequences of decision-generated affect and fatigue and how these factors impact on the allocation of attentional resources that account for the propensity to avoid decisions.

**Importance of MDM**

A number of international and national studies confirm that decision making is a central feature of managerial work. These studies include: surveys (Alimo-Metcalf & Alban-Metcalf, 2001; Lombardo, Ruderman, & McCauley, 1988); a meta-analysis of validation studies (Bartram, 2005); behaviour-centred observations in assessment centres (Craik et al., 2002; Geyling, Visser & Fourie, 2003); situational inventories (Chan & Schmitt, 2002; McDaniel, Morgeson, Finnegan, Campion, & Braverman, 2001; Weekley & Ployhart, 2005); qualitative studies (Kotter, 1982; Mintzberg, 1973, 1983); and longitudinal and correlation field studies (for example, Conway, 2000; Elbanna and Child, 2007; Dean and Sharafman, 1996; Goll and Rasheed, 1997; Maslyn, Farmer and Fedor, 1996; Wayne et al., 1997). In addition, in a recent empirical investigation of a USA representative sample of over 8,600 incumbents from 52 different managerial occupations, Dierdorff, Rubin, and Morgeson (2009) demonstrated that
behaviour-based managerial work role requirements were best represented by six factors one of which was managing decision making.

South African studies also confirm the importance of decision making in managerial success (Loubser & de Jager 1995; Mbokazi, Visser & Fourie, 2004). An additional South African study (Wheeler, 1993a) tested a two-facet model of MDM, namely, an intuition-process versus analysis, judgment and communication. Wheeler (1993b) also demonstrated that task dimensions and personality traits played a strong moderating role in participative decision making in South African managers.

The evidence to date illustrates that the value of managers resides in their decision making. For example, Howard and Choi (2000) demonstrated that decision making accounted for significant variances in salary levels and job performance ratings of business managers. Sound decisions result in valuable outcomes, while flawed decisions impact negatively and potentially quite widely. For example, the ill-fated launch of NASA’s Challenger flight and the escalation of the USA-Vietnam war (Staw, 1981) serve as vivid evidence of flawed decision making. Further, the significant impact on global economies that resulted in 50 million global job losses is also an example of the cumulative effects of poor decision making in the financial markets during 2009. Despite the significant impact of decision making on human affairs, the empirical evidence on MDM remains fragmented and scant.

A systematic and extensive content analysis and review of published research in industrial-organizational psychology in two leading journals (Journal of Applied Psychology and Personnel Psychology) from January 1963 to May 2007 revealed that research on decision making represented only 165 out of a total of 5780 (i.e., 2.9%) published articles over four and a half decades (Cascio & Aguinis, 2008). The present researcher has continued with a search from June 2007 to August 2009 and found no new published articles on decision making in both journals. This lack of prominence suggests a low priority in research on decision making and highlights the need for such research, as well as for the development of theory which can inform human resources practitioners, senior managers, or outside stakeholders and public policymakers on practices that may improve MDM.

Although evidence on the relationship between the quality of MDM processes and the accuracy of decisions is limited, most research supports a positive relationship. For instance, Janis and Mann (1977) were the first to demonstrate an explicit positive relationship between
the quality of MDM processes in reaching quality decisions. In addition, Fredrickson’s (1984) research with senior executives demonstrated a strong association between measures of a systematic-comprehensive decision process and organizational performance. More importantly, each aspect of a systematic-comprehensive decision process (i.e., seeking information, alternative generation, alternative evaluation and decision integration) exhibited a strong positive relationship with decisional performance. These studies suggest that decision makers who use more information, consider more alternatives, and seek a greater amount of advice (i.e., a systematic-comprehensive decision process) make more accurate and higher quality decisions.

In a similar vein, Goll and Rasheed (1997) confirmed a significant positive relationship between the quality of MD processes and the return on assets and sales in dynamic, volatile business environments. This contradicted earlier findings by Fredrickson (1984) and Fredrickson and Mitchell (1984) which demonstrated that comprehensiveness in decision making processes was positively related to performance in an industry with a stable environment but negatively related to performance in an industry with a dynamic environment. However, even when environmental uncertainty was included in a regression model, Dean and Sharfman (1996) demonstrated that managers who collected information and used a systematic-comprehensive process made decisions that were more effective than those who did not. Furthermore, whilst MDM is the product of a systematic-comprehensive process, the accuracy of decisions is also shaped by social, institutional and political influences. In their study, Dean and Sharfman (1993b) empirically demonstrated that a systematic-comprehensive process was in fact independent from a contextual, institutional political process in MDM. Successful decisions were positively related to a systematic-comprehensive process and negatively related to ‘political’ behaviour.

It was pointed out in Chapter Two that accountability to others activates distinct social and cognitive coping strategies in order to deal with decision ambiguity (Green et al., 2000; Janis & Mann, 1977; Lerner & Tetlock, 1994, 2003; Tetlock, Skita, & Boettger, 1989). A study by Smith, Peterson, and Schwartz (2002) illustrates how middle managers facing ambiguous situations frequently consult other individuals for guidance and Chen et al., (1996) demonstrated that ‘impression-motivated decision processing’ (i.e., a ‘go along to get along’ heuristic) biased decision processes in a direction consistent with others’ opinions in order to
satisfy valued social goals. Moreover, individuals high in political skill used appropriate influence tactics in order to neutralize the ambiguity of contextual and accountability demands (Hochwarter et al., 2007).

Further, three investigations by Ferris et al. (2005) reported significant correlations between ease of social influence (i.e., political skill) and upward influence and forming coalitions. Social astuteness displayed a strong correlation with political savvy. Moreover, politically skilled individuals were also shown to make better decisions (Kolodinsky et al., 2007). In addition, political skill was found to be a significant and positive predictor of rationality, suggesting that it is a potent upward influence tactic.

What follows is a review of the extant research that demonstrates MDM as a cognitive problem of attempting to find the best solution and making decisions against a background of divergent political interests. Table 3.1 provides a summary of these empirical findings in order to illustrate MDM as a dual, systematic-comprehensive and political/social process. The table lists authors, methodology employed and a synopsis of major findings.

The findings reported in Table 3.1 confirm that MDM is a product of a systematic-comprehensive decision process and also shaped by embedded institutional politics (see also, Elbanna, 2006; Elbanna & Child, 2007; Brousseau et al., 2006; Garvin & Roberto, 2001; Papadakis, 2006; Tsui & Ashford, 1994). The co-existing requirements of both a systematic-comprehensive decision process and social-political constraints, however, both favour quality decisions and outcomes. The reason for this is that skilled managers are rarely likely to coerce decisions that would be irrational and managers increase their likelihood of success by engaging in modes of influence that are generally justified and defended on rational grounds (Chen et al., 1996; Ferris et al., 2005; Hochwarter et al., 2007; Schwarzwald et al., 2004; Sullivan et al., 2003; Wayne et al., 1997).
Table 3.1 Empirical Research: MDM as a Dual, Systematic-Comprehensive and Political/Social Process

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample</th>
<th>Design</th>
<th>Analysis (level of analysis)</th>
<th>Major findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fredrickson and Mitchell (1984)</td>
<td>109 managers</td>
<td>Cross-sectional</td>
<td>Correlation (decision level)</td>
<td>Quality of MDM processes were positively related to performance</td>
</tr>
<tr>
<td>Bourgeois and Eisenhardt (1988)</td>
<td>4 computer firms</td>
<td>A multiple case study; longitudinal</td>
<td>Content analysis (organization-level)</td>
<td>The higher the quality MDM processes, the better the performance of the firm</td>
</tr>
<tr>
<td>Savard and Rogers (1992)</td>
<td>3 studies, 120 students</td>
<td>Role-play simulations Mixed experimental design</td>
<td>Repeated –measures MANOVA</td>
<td>Individuals chose to reason, made requests, and made the focal person feel good more frequently than assertive threats, bargaining</td>
</tr>
<tr>
<td>Dean and Sharfman (1993a)</td>
<td>57 strategic decisions in 24 firms</td>
<td>Multiple-informant, structured interviews</td>
<td>Multiple regression (decision level)</td>
<td>Environmental uncertainty impacted the quality of MDM processes. Competitive threat and uncertainty degraded the quality of MDM process</td>
</tr>
<tr>
<td>Dean and Sharfman (1993b)</td>
<td>61 strategic decisions in 24 companies</td>
<td>Multiple-informant, structured interview</td>
<td>Multiple regression (decision level)</td>
<td>The substantive task of rationality/ comprehensiveness and the institutional/social/political context were distinct dimensions of MDM processes</td>
</tr>
<tr>
<td>Dean and Sharfman (1996)</td>
<td>52 decisions</td>
<td>Field study; longitudinal</td>
<td>Multiple regression (decision-level)</td>
<td>Procedural rationality was positively related to decision effectiveness</td>
</tr>
<tr>
<td>Maslyn et al. (1996)</td>
<td>225 employees</td>
<td>Field study; cross-sectional; mail survey</td>
<td>SEM</td>
<td>Upward influence actions following a failed influence attempt were predicted with individual differences and the agent-target relationship</td>
</tr>
<tr>
<td>Goll and Rasheed (1997)</td>
<td>62 firms</td>
<td>Field study; cross-sectional; mail survey</td>
<td>Correlation; multiple regression</td>
<td>The quality of MDM processes were positively associated with performance</td>
</tr>
<tr>
<td>Wayne et al.(1997)</td>
<td>247 dyads subordinates and managers</td>
<td>Field study; cross-sectional; mail survey</td>
<td>SEM</td>
<td>Influence tactics were related to managers’ perceptions of subordinates' interpersonal skills, use of reasoning, assertiveness, and favours. Bargaining and self-promotion were negatively related to these perceptions</td>
</tr>
<tr>
<td>Papadakis (1998)</td>
<td>38 firms</td>
<td>Field study; cross-sectional</td>
<td>Zero-order correlation (decision-level)</td>
<td>A positive relationship between the quality of MDM and performance was reported</td>
</tr>
<tr>
<td>Papadakis, Lioukas, and Chambers (1998)</td>
<td>70 decisions</td>
<td>Multi-method, in-depth field research study</td>
<td>Multiple regression; factor analysis (decision-level)</td>
<td>Quality of MDM processes were affected by both decision-specific characteristics and internal context</td>
</tr>
<tr>
<td>Study</td>
<td>Sample</td>
<td>Methodology</td>
<td>Analysis (level of analysis)</td>
<td>Major findings</td>
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<tr>
<td>-----------------------------</td>
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<tr>
<td>O'Connor and Arnold (2001)</td>
<td>58 student dyads</td>
<td>Role-play simulation</td>
<td>ANOVA; regression</td>
<td>Negotiators who reached an impasse experienced negative affect, developed negative perceptions of their counterpart/process, were less willing to work together, shared less information of managing conflicts.</td>
</tr>
<tr>
<td>Hough and White (2003)</td>
<td>400 decisions examined from 54 executive teams</td>
<td>Simulation</td>
<td>ANOVA; correlation; Regression (decision level)</td>
<td>Positive relationship between the quality of MDM and performance (volatility moderated the relationship between rationality and decision quality).</td>
</tr>
<tr>
<td>Schwarzwald et al. (2004)</td>
<td>194 workers, 97 supervisors</td>
<td>Field study; cross-sectional; mail survey</td>
<td>SEM, ANOVA</td>
<td>Managers and subordinates reported similar perceptions about the use of influence tactics; soft tactics were found to be the most popular.</td>
</tr>
<tr>
<td>Ferris et al. (2005)</td>
<td>35 School administrators</td>
<td>Field study; cross-sectional; mail survey</td>
<td>Regression analysis</td>
<td>Political (social influence) skill significantly predicted job performance and effectiveness ratings in two samples made up of distinct occupational groups.</td>
</tr>
<tr>
<td>Tasa and Whyte, 2005</td>
<td>162 business undergraduates</td>
<td>Simulation experimental, between-subjects design</td>
<td>Regression analysis, ANOVA</td>
<td>The quality of MDM processes was positively related to decision outcomes.</td>
</tr>
<tr>
<td>De Dreua et al. (2006)</td>
<td>220 students in dyads</td>
<td>3 Experiments; factorial design</td>
<td>ANOVA, regression analysis</td>
<td>Cooperative dyads reached higher joint outcomes; engaged in more problem solving.</td>
</tr>
<tr>
<td>Elbanna and Child (2007)</td>
<td>169 managers</td>
<td>Multi-method field study, cross-sectional; mail survey</td>
<td>Regression analysis (decision-level)</td>
<td>The quality of MDM processes influenced decision effectiveness. Firm performance rather than environmental uncertainty appeared to be the most important moderator of the relationship between the quality of MDM and decision effectiveness. A positive relationship between a systematic-comprehensive process and organizational outcomes and a negative relationship between political behaviour and organizational outcomes were found.</td>
</tr>
<tr>
<td>Kolodinsky et al. (2007)</td>
<td>Dyads of 291 subordinates and their supervisors</td>
<td>Field study; cross-sectional; mail survey</td>
<td>Hierarchical multiple regression analysis</td>
<td>Political skill was found to relate directly to the use of rational influence and supervisor ratings of job performance.</td>
</tr>
</tbody>
</table>
Summary

In summary, making decisions is a central feature of managerial work yet empirical research on decision making is under-represented in published articles over four and a half decades. Notwithstanding this limitation, the following is evident:

- A positive and strong association between the use of a systematic-comprehensive decision process and organizational performance.
- This being said, MDM is not only a cognitive problem of attempting to find the best solution. MDM is also a political/social process shaped by embedded institutional politics which require the rational modes of social influence in order to secure resources, resolve divergent interests and counteract political pressures in order to make decisions that serve the interests of the organization.

Various authors (Elbanna & Child, 2007; Finucane & Lees, 2005; Halebian. et al., 2004; Hambrick et al., 2005b; Hiller & Hambrick, 2005; Papadakis, 2006; Papadakis & Barwise, 2002; Zaccaro, 2001) have argued that a greater understanding of why and how different decision processes are followed might be obtained by including individual differences and contextual variable interactions (as moderating variables), to provide insights into MDM processes and outcomes. This is the topic of the next subsection which reviews empirical evidence that differential appraisals arise from an individual’s ongoing interaction with the decision context. These differential appraisals moderate individuals’ subjective experiences of complexity, ambiguity and conflict in their attempts to make good decisions.

Appraisal of Organization Context

Appraisals about certainty and control equate to confidence in an individual’s competence to exercise control in MDM. Furthermore, appraisals of certainty and control exert an influence on risk assessments in decision making. For instance, Krueger and Dickson (1994) in an experimental study involving business graduates showed that individuals who were led to believe they were not very competent saw more threats and took fewer risks in decision making. Consistent with the previous study, Raghunathan and Pham (1999) confirmed that
students who were experimentally induced to feel anxious (see also Pham, 2004, in this regard), preferred uncertainty-reducing decisions. Evidence that anxiety evokes a preference for decisions that are safer or enhance one's sense of control is robust and generalizable across different types of decisions (Raghunathan et al., 2006).

Another important topic to consider in MDM is that of subjective appraisals and their influence on effortful performance. Two different cognitive tasks may take similar amounts of time, but one task might be seen as much more effortful than the other (Kahneman, 1973). In fact, Bettman, Johnson and Payne (1990) reported that the overall correlation index between time spent on a task and self-reported effort is 0.29. This indicates that the degree to which tasks are experienced as complex is related to the attentional effort expended. Various authors have advanced the notion that when a task is difficult individuals are prompted to increase their allocation of effort toward on-task activities (Foo et al., 2009; Kanfer & Ackerman, 1989; Kanfer et al., 1996). Moreover, theory and research also suggest that difficulty and effort are related to each other and when individuals are aware that they have exerted more effort they rate a task as more difficult (Fisher & Noble, 2004). In fact, attentional effort and task difficulty may represent similar constructs. In this regard, Yeo and Neal (2004) illustrated that attentional effort and perceived task difficulty were highly correlated in a multilevel analysis that investigated the relationships at within- and between-person levels of analysis, with multiple trials of practice on an air traffic control task. Perceived difficulty and subjective attentional effort are thus sensitive to task difficulty but may be mediated by individual differences in reactions to perceptions of task difficulty (Yeo & Neal, 2008).

Consequently, task difficulty can be both a subjective (requiring attentional effort) and an objective parameter of task difficulty. Hochwarter et al. (2007) demonstrated that individuals occupying comparable work environments with equivalent demands and expectations, reported levels of felt accountability that were inconsistent and even contradictory. Further, Fox, Dwyer, and Ganster (1993) reported that objective workload demands for institutional nurses explained less than 10% of their subjectively reported work demands. Similarly, findings by Alexander et al. (2006) and Hochwarter et al. (2007) demonstrated that operative constraints are largely mediated by individuals’ subjective interpretations of objective accountability conditions.
The next subsection presents empirical evidence to illustrate that managers’ confidence in their ability to exercise control over the context accounts for differences in decision making processes.

**Certainty and Confidence**

Confidence in its common meaning refers to a certainty about handling something and its antonym is uncertainty or doubt about handling something (Stajkovic, 2006). Empirical evidence across laboratory and field settings supports the argument that uncertainty is related to individuals’ confidence. For instance, a series of experiments demonstrated that individuals were willing to choose risky decisions even when offered an equally probable chance event as an alternative when they were confident in their competence (Heath & Tversky, 1991). Similarly, in other studies greater confidence accounted for decisions involving risk in difficult social encounters (i.e., negotiation) (Ferrari, 1994; Halebian et al., 2004; Stevens & Gist, 1997, 1998; Sullivan et al., 2003). Conversely, in studies by Effert and Ferrari (1989), Ferrari (1991b, 2000, 2001) and Ferrari and Dovidio (2001) low confidence was shown to be related to a delay in decision making. In fact, findings by Mirels, Greblo, and Dean (2002) illustrated that self-doubt was associated with a general tendency to avoid responsibilities, especially in situations involving decision making. Further robust evidence was provided in a study by Goodie and Young (2007), in a laboratory setting, that indicated a correlation of 0.86 between decision accuracy and confidence. Similarly, in a series of simulation studies, Bandura and Jourden (1991) and Wood et al. (1990) illustrated that self-doubt in decision making impaired the quality of decision making processes.

**Control**

Apart from confidence, beliefs about control also impact on decision making. In a study with entrepreneurs, managers, employees and students as respondents, Le Roux et al. (2006) demonstrated that control beliefs accounted for a significant positive relationship with the decision to start a business and a significant negative association with perception of risk. Experimental evidence by Goodie (2003) and Goodie and Young (2007) illustrated that individuals who believed they were in control showed increased persistence and initiative in risk taking, even when their competence was relatively low. Beliefs about control moderate the
decision to pursue a business venture or not. For example, in a random sample of 217 entrepreneurs, Markman, Baron and Balkin (2005) reported that perceived control over adversity and perceived responsibility regarding the outcomes of adversity differentiated entrepreneurs from non-entrepreneurs. Moreover, managers’ efforts toward organizational governance and compliance are influenced by their perceived ability to comply. This very specific appraisal of control of imposed compliance requirements was mediated by perceived controllability in a study by Jenkins (1994). Jenkins demonstrated that the importance of managerial cognitions in corporate compliance with the law accounted for a unique contribution of self-perceptions of capability over and above perceptions of actual control.

Managers who demonstrate beliefs in their ability to exercise control are able to achieve good organizational functioning and decision making even when they have low perceived support. In this regard, Hochwarter et al. (2006) illustrated that social skill was positively related to job performance among individuals who experienced constraints in terms of insufficiency of resources, information and cooperation. Similarly, in a series of studies, perception of more control was illustrated to neutralize the dysfunctional effects of ambiguity and role conflict via the exercise of political skill (Perrewé et al., 2004; Perrewé, Zellars, Rossi, Ferris, Liu, Zinko, & Hochwater, 2005).

In a field research programme by Bandura and Wood (1989), beliefs about the controllability of organizations were experimentally induced. Findings demonstrated that appraisals of the degree to which the environment can actually be controlled influenced decision making performance. In addition, managers who saw organizations as controllable maintained a strong sense of confidence in their abilities, set increasingly challenging goals, and applied effortful decision processes. Moreover, when individuals believed that their operative environment was controllable they increased their effort, which validated their confidence and enhanced their likelihood of success.

In addition, a number of studies have demonstrated that low perceived control contributed to stress, anxiety and burnout (see, for example, Jerusalem and Schwarzer, 1992; Jex, Bliese, Buzzell, & Primeau, 2001; Jex & Gudanowski, 1992; Maslach et al., 2001; Rothmann & Malan, 2003; Salanova, Peiro, & Schaufeli, 2002; Schwarzer, 1992; Schwarzer & Hallum, 2008; Xie, 2007). Thus, taken as a whole, the evidence suggests that individuals’ internal attributions of certainty and control affect how they interpret the conditions under
which they make decisions. Further, the context of MDM provides an opportunity for individual judgments to be exercised about one’s own capabilities and the extent to which one can exercise control over imposed and accountability demands.

Summary

Differential appraisals moderate individuals’ subjective experience of complexity that influence effortful performance. The following points are important in this regard:

- MDM provides an opportunity for individual judgments to be exercised about one’s own capabilities and the extent to which one can exercise control over imposed and accountability demands. The empirical evidence suggests that individuals' internal attributions (appraisals) about certainty and control affect how they interpret the conditions under which they make decisions.
- Individuals' objective and subjective appraisals of decisional demands influence their confidence in their abilities and the extent to which they believe they can control the decision context. Self-efficacy beliefs mediate these interpretative biases that impact on the application of attentional effort as a covariate of perceived certainty and control. These subjective appraisals influence the allocation of attentional resources which give rise to the volitional selection of cognitively effortful information search, deliberation and rational social influence in MDM.

The next subsection presents research that demonstrates that self-efficacy beliefs influence perceptions of confidence and control by regulating attention and reducing adverse affect.

Self-Efficacy Beliefs

Self-efficacy beliefs have been remarkably prominent in research over the past two decades. For example, by 2007 Judge, Jackson, Shaw, Scott, and Rich reported that 10,000 investigations and 800 articles had been published in organizational journals on self-efficacy
beliefs. A South African search for studies for the period 1979 to 2009 by the present researcher revealed 128 publications and articles. This interest in self-efficacy beliefs is evident in the growth in hits from 1,180,000 in May 2007 to 3,520,000 in August, 2009 on Google, conducted for the term "self-efficacy" by the researcher. In spite of this prominence, self-efficacy beliefs have received limited attention and have not been investigated sufficiently in decision related research even though it is seen to be an important determinant of MDM (Zacarro, 2001). In fact, Hiller and Hambrick (2005) state in their review that they are not aware of studies that have examined self-efficacy beliefs and decision making in executive samples. A review of the South African publications by the present researcher also revealed no published studies that have focused on self-efficacy beliefs and MDM. Given such a voluminous amount of research on self-efficacy beliefs in general and its widespread application, the following subsection examines existing empirical evidence of what contribution self-efficacy beliefs make to individual work performance and decision making processes.

**Self-efficacy Beliefs: Certainty and Control**

The subjectively experienced demands of MDM are not a fixed property of situational constraints but represent a relationship between perceived coping capabilities and potentially aversive aspects of the environment. Thus, how the demands of MDM are subjectively experienced is not dependent on situational constraints, but on the relationship between perceived coping abilities and situational constraints. Chapter Two provided an argument that an individual’s subjective perceptions and appraisals of decision difficulty depend in part on differences in self-efficacy beliefs. Mangos and Steele-Johnson (2001) illustrated that self-efficacy beliefs mediated the effects of subjectively experienced task demands on performance. In a similar vein, Maynard and Hakel (1997) have demonstrated that individual appraisals of task complexity partially mediate the effects of objective task complexity. In addition, both objective and subjective task complexity were significantly related to task performance.

Further validity to the general thesis that decision making difficulty is determined relationally rather than according to absolute properties was confirmed by Bandura and Jourden (1991). In an additional study, Hu et al. (2007) demonstrated that the closer the match between self-efficacy beliefs and perceived task complexity, the more extensively individuals searched
for information in order to make decisions. Brown et al. (2001) assessed the processes by which information seeking and self-efficacy contribute to effectiveness in industrial selling and demonstrated that individuals with high self-efficacy beliefs seek, integrate, and use information more effectively, whereas individuals with low self-efficacy beliefs appear less capable of integrating information obtained through different methods and using it effectively in order to increase their role clarity and performance. Similarly, Lucas et al. (2006) demonstrated that an individual’s subjective perceptions of problem difficulty depended, in part, on individual differences in self-efficacy beliefs. Consequently, self-efficacy beliefs via appraisal-generated cognitions help define decisions as difficult or not.

Self-efficacy beliefs and goals represent important proximal mediators to performance. In this regard, Locke and Latham (2002) reported that self-efficacy beliefs related to performance and to goal setting, with the latter also associated with performance. In fact, the relationship between self-efficacy beliefs and goals is strong (Judge et al., 2007). Moreover, Payne, Youngcourt, and Beaubien (2007) reported a strong negative relationship between self-efficacy beliefs and avoidance as a goal. Support for the notion that motivation (i.e., effort) stems from challenges created by goals and self-efficacy beliefs have been consistently reported (Cervone, Jiwani, & Wood, 1991; Chen et al., 2000; Martocchio & Judge, 1997; Phillips & Gully, 1997).

Studies by Latham and Seijts (1999) and Latham and Brown (2006) illustrated the negative effect of goals on performance according to the type of goal (i.e., proximal vs. distal) and demonstrated that individuals who pursued proximal outcome goals (i.e., present-directed intentions) realized higher performance than those who pursued ‘do your best’ as a vague distal goal. Similarly, Cervone and Wood (1995) demonstrated that across 10 weeks of a simulated business activity, where individuals (graduates) served as ‘managers’ of a business organization, goals, specific feedback and self-efficacy beliefs combined to predict nearly half of the variability in changes in performance.

The next subsection reviews the prominence, utility and empirical evidence of the role that self-efficacy beliefs play in the exercise of control.
Self-efficacy beliefs and the exercise of control

The exercise of control involves the level of confidence in one’s ability to effect changes in the environment through the productive use of one’s capabilities and enlistment of effort (Bandura, 1991, 1992, 1999). For instance, control beliefs accounted for 36% to 46% of the variance in self-efficacy beliefs in perceived behavioural control and intention in one study (see, for example, Armitage & Conner, 1999). Further, Ajzen (2002) illustrated that perceived control accounted for a significant portion of variance in behavioural intentions in a study with students. Similarly, a South African study by Pretorius and Rothmann (2001) demonstrated that self-efficacy beliefs showed a significant inverse relationship with external control.

This conceptualization of self-efficacy beliefs as "people's beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives" (Bandura, 1991, p. 257) is especially relevant to MDM. Perceived control over events accounts for considerable variance in intentions and actions (Ajzen, 1991, 2002). Ajzen’s Theory of Planned Behavior postulates that, by keeping intention constant, the effort expended to bring a course of action to a successful conclusion, is likely to increase with perceived behavioural control. Thus, behavioural intention is under volitional control, that is, an individual can decide at will to perform or not perform the behaviour. In these arguments, the concern is with control over behaviour itself, not with control over outcomes or events. Perceived behavioural control can, however, be used as a substitute for a measure of actual control.

Any work context contains potential opportunities to take initiative. Taking initiative represents the exercising of control over these challenges. In a longitudinal study with full time employees in East Germany (N = 543), Speier and Frese (1997) illustrated that half of the common variance of control and initiative was mediated by self-efficacy beliefs. Consequently, self-efficacy beliefs acted as an intervening variable between initiative and making autonomous decisions to exercise control. Managers need to continuously decipher and monitor their understanding of the organization's and significant others’ expectations in MDM. According to Weick (1995, p. 92), the absence of a clear and accurate understanding of role expectations “means that the assumptions necessary for rational decision making are absent”. Self-efficacy beliefs moderate the appraisal of uncertain/ambiguous environments and facilitate sensemaking by integration and effective use of complex information. For instance, Brown, Westbrook, and
Challagalla (2005), in a survey of 340 sales people, illustrated that self-efficacy beliefs moderated the inquiry and monitoring of information. Further, individuals with high self-efficacy beliefs responded more adaptively to their decision environment by using feedback and were able to translate their learning into improved performance (Cervone et al., 1991). Moreover, Seijts et al. (2004), in a study of MBA students in a complex business simulation, demonstrated that self-efficacy beliefs and information search accounted for learning and performance.

These results suggest that managers with high self-efficacy beliefs seek, integrate, and use information to improve their clarity concerning roles and expectations and thereby reduce ambiguity. In so doing they prevent misdirected or insufficient effort and inability to anticipate organizational expectations.

**Self-efficacy Beliefs and Work Performance**

Substantial research demonstrates a link between self-efficacy beliefs and work performance (Hysong & Quiñones, 1997; Judge & Bono, 2001; Locke & Latham, 2002; Stajkovic & Luthans, 1998a, 1998b). Bandura and Locke (2003) also presented converging evidence from nine meta-analyses that represented diverse methodological and analytic strategies that self-efficacy beliefs enhanced motivation and performance attainments. Similarly, a review and meta-analysis by Sadri and Robertson (1993) illustrated a positive relationship between self-efficacy beliefs and performance. This relationship in simulated situations showed a coefficient of 0.60 that was stronger than compared to performance in real situations.

Self-efficacy beliefs’ association with performance, however, varies in relation to several moderating variables. In a meta-analysis of the relevant literature Judge et al. (2007) illustrated that self-efficacy beliefs’ association with performance was moderated when: the job or task was low (vs. high) in complexity; there was a short or intermediate (vs. long) interval between the measure of self-efficacy beliefs and work-related performance; goals were assigned vs. no goals; individuals had prior (vs. no prior) exposure to the job or task; and when the participants were undergraduate versus postgraduate students.

There is some existing research on the effects of self-efficacy judgments on performance in a complex decision making task (Bandura & Jourden, 1991; Bandura & Wood,
1989; Cervone et al., 1991; Cervone & Wood, 1992; Wood & Bandura, 1989). However, this research has mostly studied the same task and setting, in which participants manage the employees of a simulated manufacturing business. A recent study by Arenas et al. (2006) illustrated that self-efficacy beliefs impacted decision making via positive affect in a study in a manufacturing setting.

*Self-efficacy Beliefs: Influence on Effort and Persistence*

Evidence from experimental settings and cross-sectional research has demonstrated that individuals with higher self-efficacy beliefs were more likely to engage and persist in cognitive tasks than those with lower self-efficacy beliefs (Bouffard-Bouchard, 1990; Cervone & Peake, 1986; Khan & Nauta, 2001; Multon, Brown, & Lent, 1991; Nel, 2007; Phillips & Gully, 1997). Individuals with stronger beliefs in self-efficacy, specifically in relation to goal attainment, display greater intensification of effort than those with weaker self-efficacy beliefs (Bandura & Cervone, 1983). In addition, individuals with high self-efficacy beliefs persisted longer in their influence attempts when compared to those low in self-efficacy beliefs (Savard & Rogers, 1992). High self-efficacy beliefs also reduced the effects of failed negotiations. In this regard, O'Connor and Arnold (2001) demonstrated that individuals with low self-efficacy beliefs who failed in negotiations were less willing to work together in the future, planned to withhold information, behaved less cooperatively, and lost faith in negotiation as an effective means of managing conflicts.

Strong self-efficacy beliefs have also been positively related to the intention to set up an independent business. In a cross-sectional study, Chen, Greene and Crick (1998) reported that self-efficacy beliefs differentiated entrepreneurship students from students in both management and organizational psychology. Further, self-efficacy beliefs of actual small business founders were higher when compared to non-founders and Markman et al. (2005) revealed that entrepreneurs displayed higher overall perseverance given their strength in self-efficacy beliefs. Contradictory to this, Le Roux et al. (2006) could not confirm that business risk perception was influenced by self-efficacy beliefs. These authors showed that the correlations between self-efficacy beliefs and the decision to start a business and business risk perception were all low and insignificant. Possible reasons that may have accounted for this included whether the instrument they used was a valid measure of self-efficacy beliefs. Partial support was found
however for the association of entrepreneurial cognition and entrepreneurial self-efficacy beliefs in another South African study. In a survey with individuals ($N = 161$) with varying demographics who met qualifying criteria from an unrestricted range of businesses and industries, Urban (2008) demonstrated a modest association between entrepreneurial cognitions (i.e., the mental maps about the contacts, relationships, resources and assets necessary to engage in entrepreneurial activity) and self-efficacy beliefs, based on the decision to start a new venture.

Although a large corpus of empirical evidence supports a symmetric relationship between self-efficacy beliefs and persistence, other studies reveal a non-monotonic relationship between self-efficacy beliefs, attentional effort and persistence. For example, Tasa and Whyte (2005), in a study with groups of business students who participated in a complex business strategy simulation, illustrated a significant curvilinear relationship between self-efficacy beliefs and vigilance (i.e., a systematic-comprehensive process) in decision making. As self-efficacy beliefs increased from low to moderate levels, the quality of the systematic-comprehensive MDM process increased. However, when the level of self-efficacy beliefs surpassed relatively moderate levels, the reliance on a vigilant systematic-comprehensive process declined. These findings supported studies by Bandura and Jourden (1991) and Stone (2002). Higher perceptions of ability relative to others predict greater degrees of overconfidence (Larrick et al., 2007) in individuals’ beliefs about the accuracy of their decisions, but without an increase in the application of an effortful decision process (see, for example, Malmendier & Tate, 2003). Such overconfidence and high beliefs in self-efficacy thus lead to the withdrawal of cognitive effort. For example, Stevens and Gist (1997), in a study with 60 MBA students, confirmed that individuals with high self-efficacy beliefs demonstrated greater cognitive withdrawal than those with low self-efficacy beliefs.

High self-efficacy beliefs also contribute to an irrational escalation of commitment to a losing course of action. Dysfunctional persistence was pronounced under conditions of high self-efficacy beliefs in a study with undergraduates (Whyte, Saks, & Hook, 1997). Similarly, a study of the airline and trucking industries over a ten-year period revealed that greater past successes on the part of managers led to more confidence in the correctness of past strategies, higher self-efficacy beliefs and, consequently, poorer quality MDM processes (Audia et al., 2000). Greater satisfaction with past performance has been related to dysfunctional persistence.
with the status quo and little need to adjust subsequent decisions (Geletkanycz & Black, 2001). Further, in contrast to the conventional wisdom that rational thinking increases decision quality, Wong, Kwong, and Ng (2008) illustrated that high scorers in rationality were more likely to have an escalation bias than those individuals with lower scores. Their results showed that high rational ability increases beliefs in prior decisions which in turn increases an escalation bias. Rational decision making, consequently, entrenches the belief in prior decisions and these beliefs were significantly related to an escalation tendency.

Taken as a whole, these findings indicate that high self-efficacy beliefs produce overconfidence in individuals’ beliefs about the accuracy of their decisions, but without increasing their application of an effortful decision process. Overconfidence creates ‘complacent self-assurance’ which may reflect a ‘deviation-amplifying loop’ (Lindsley, Brass, & Thomas, 1995) where higher performance and higher self-efficacy beliefs create an upward spiral. For instance, Shea and Howell (2000) examined the pattern of the relationships between self-efficacy beliefs and performance in a study involving 148 students working on a manufacturing task over four trials. The findings demonstrated that the pattern of changes in self-efficacy beliefs and performance contained self-corrections. Across successive trials, successful performance outcomes fostered faster, more superficial and routine information processing and individuals deferred to actual performance as the strongest predictor of confidence for future performance. In support of this notion, a longitudinal field experiment by McNatt and Judge (2004) illustrated that self-efficacy beliefs became less predictive of performance as the interval between self-efficacy beliefs and subsequent performance increased. Furthermore, Richard, Diefendorff and Martin (2006), Vancouver et al. (2002), and Vancouver, Thompson, and Williams (2001) have all demonstrated that the positive relationship between self-efficacy beliefs and performance might be due, in greater part, to the influence of performance on self-efficacy beliefs than the influence of self-efficacy beliefs on performance.

These findings suggest that perseverance and effort, along with strong self-efficacy beliefs, may lead to dysfunctional confidence that affects the allocation of effort and attentional resources, thereby affecting the quality of decision making processes. Consequently, self-efficacy beliefs become more of an effect and less of a direct cause of performance as individuals experience greater mastery (Ewart, 1995).
In conclusion, the relationship between self-efficacy beliefs and the quality of MDM processes appears to be curvilinear, at least in the context of ambiguous decision demands. Consequently, complacency with the validity of current decision processes, associated with stronger beliefs and higher goals (that accompany past success), might induce a decrease in attentional effort in the application of systematic-comprehensive decision processes.

*Self-Efficacy Beliefs, Arousal and Affective Outcomes*

The previous subsection illustrated that differential appraisals provide an affective summary of specific threats or benefits that arise from an individual’s ongoing interaction with the decision context and demands. Self-evaluative reactions and affect reflect the match between self-efficacy beliefs and the subjective appraisal of the situational constraints that can redirect attentional resources from the decision process task to the affective experience. Bandura (1986) argued that self-efficacy beliefs shape affective experiences and thus mediate the information conveyed by a particular affective outcome. Although most authors generally accept the theoretical assumption that self-efficacy beliefs mediate affect, the empirical evidence suggests that the relationships between self-efficacy beliefs and affective outcomes are reciprocal. On the one hand, self-efficacy beliefs have a mediating effect on anxiety, arousal and vulnerability to stress whereas, on the other hand, affective states serve as information that can impact on self-efficacy beliefs. Consequently, in some instances self-efficacy beliefs influence affect while, in other instances, affect influences appraisals of self-efficacy beliefs (Ewart, 1995).

Less than adequate self-efficacy beliefs tap resources that inherently decrease the attentional focus that can be dedicated to complex tasks like decision making (Beal et al., 2005; Brief & Weiss, 2002; Weiss et al., 2005). In this regard, Sarason et al. (1996) provided considerable evidence that anxiety presents a significant problem of intrusive, interfering thoughts which diminish attentional resources that can be devoted to the efficient execution of tasks. Moreover, Schwarzer (1996) reported a correlation of 0.67 between time spent on worrying (i.e., cognitive interference) and anxiety. Cognitive interference is thus closely linked to anxiety (see, for example, Baumeister et al., 1994; and Yee & Vaughan (1996) for a review) and a number of studies have provided evidence to show that intrusive thoughts undermine the effective use of capabilities (see, for example, Bhattacharjee and Moreno, 2002; Kanfer &
Further confirmatory support in the form of a study by Ackerman, Kanfer, and Goff (1995) attests to the fact that intrusive thoughts accounted for a significant and substantial amount of variance in performance, which is consistent with the role that deficits in affect regulation have on task performance (Kanfer & Ackerman, 1996). Bandura, Caprara, Barbaranelli, Gerbino, and Pastorelli (2003) also provide robust findings of a structural pattern of influences that verify that self-efficacy beliefs regulate affect that impacted on socio-emotional adaptation. Moreover, their findings suggested that beliefs in self-efficacy mediated affect regulation.

In addition, self-efficacy beliefs have been demonstrated to lessen the effect on negative affect resulting in impasses in a negotiation study by O'Connor and Arnold (2001). Similarly, Bandura and Jourden (1991), in a path analysis study, provided corroborating evidence to illustrate that self-efficacy beliefs impacted the quality of decision processes and that affective reactions operated as significant determinants of decisional performance attainments. Arenas et al. (2006) also reported that individuals with higher self-efficacy beliefs displayed more positive affect in a management task that involved decision making under conditions of uncertainty.

Frequently recurring affect may stabilize and become affective traits or motivational components of temperament/personality traits. In a meta-analysis, Judge and Illies (2002) provided confirmatory evidence that leaders with lower emotional stability tend to have lower self-efficacy beliefs in accomplishing their leadership functions. Lower emotional stability was related to self-efficacy beliefs because of a general tendency to be anxious and less confident of oneself. In a study of 230 employees (with approximately one third as supervisors) from three large oil companies in Brazil over a fifteen-month period, Perrewé et al. (2004) demonstrated that political skills exhibited a significant negative correlation with anxiety and also displayed a positive relationship with self-efficacy beliefs. Consequently, the relationships between self-efficacy beliefs and negative affect (i.e., anxiety) are moderated by the use of political skills.

Individuals with strong self-efficacy beliefs are therefore more likely to be comfortable in ‘high demand’ jobs where they can exercise personal judgment. For example, Jex and Bliese (1999), in a large sample of military personnel \( N = 2273 \), found that self-efficacy beliefs...
moderated several stressor-strain relationships. Respondents with strong self-efficacy beliefs reacted less negatively, in terms of psychological and physical strain, to long work hours and work overload than those reporting low levels of efficacy beliefs. In addition, individuals with high self-efficacy beliefs displayed little negative affect in response to stressful experimental manipulations in a study by Jerusalem and Schwarzer (1992). Jex et al. (2001), in a survey of 1500 US military staff, demonstrated that coping with stressors was strongest among those participants who displayed high self-efficacy beliefs. Their results suggest that high levels of self-efficacy may indeed help individuals cope more effectively with stressors and that these individuals might not react as negatively to work overload as those with low self-efficacy. This is likely to occur because individuals with high levels of self-efficacy are also likely to have developed more effective ways of coping with stressors than those with low levels of self-efficacy.

Strong self-efficacy beliefs therefore enhance resilience by reducing the attentional resources required by a situation (through personal control over aversive affect) and also by moderating the perceptions of organizational stressors as well as the impact that organizational stressors have on the emotional and physical health (and burnout) of individuals (e.g., Rothmann & Malan, 2003; Schwarzer, 1992). For instance, in a study of 140 workers that used new technologies in their jobs, Grau et al. (2001) illustrated that individuals with low levels of self-efficacy beliefs displayed more emotional exhaustion in increased-stress situations, whereas an increase in stressors was not associated with strain for those with high levels of self-efficacy beliefs. In a similar vein, Salanova et al. (2002) demonstrated that computer-specific self-efficacy beliefs moderated the relationship between job demands and control, as well as the levels of burnout. Conversely, having high job control exacerbated the association between job demands and poor health among ineffectivcal individuals (Schaubroeck, Jones, & Xie, 2001). Consistent with these findings, in a longitudinal study of teachers (N = 1203) in Syria and Germany conducted over a period of one year, Schwarzer and Hallum (2008) demonstrated that self-efficacy beliefs protected participants from the experience of job strain and the escalation of burnout. A cross-lagged panel analysis also confirmed the direction of effects hypothesis to show that earlier low self-efficacy beliefs accounted for later burnout. This confirmed other cross-cultural research that these authors have conducted with teachers.
These studies illustrated that perceptions of high job control lessened the linkage between job demands and poor health among individuals with high self-efficacy beliefs.

Schaubroeck and Merritt (1997), in a study with health professionals, identified self-efficacy beliefs as a moderating variable that determined whether job control contributes positively or negatively to coping with work stressors. Similarly, Brown et al. (2005) reported a pattern of moderated mediation in which high sales self-efficacy beliefs were related to performance when role overload was low but not when role overload was high. Thus, an environmental constraint (i.e., lack of autonomy or job control) seems stressful particularly for individuals with high levels of self-efficacy beliefs. These findings suggest that there are boundaries regarding the effects of self-efficacy beliefs on goal setting and performance. However, feeling incompetent and not having control over the task still remains the most exhausting combination of factors because individuals with low self-efficacy beliefs may not believe that they will be able to carry out their job responsibilities, display more negative affect and view stressors as threatening.

Affect also provides implicit information about one’s self-efficacy beliefs (see an elaboration of affect as information in a later subsection of this research review). In this regard, Bandura (1991) explained that affect is repeatedly recruited in the service of behaviour that reflects on personal competence. Affect, once elicited, has a dynamic influence on how information is selected, interpreted, processed and remembered (e.g., Forgas et al., 2004). For instance, positive affective cues are experienced as self-efficacy (Isen, 2001; Schwarz & Clore, 2003) and negative arousal might be thought to confer negative information about oneself and one's abilities (Gasper & Isbell, 2007). Physiological arousal as one prominent constituent source of self-efficacy beliefs was reported in a study of 1,030 employees in three different organizations (van Vianen, 1999). Similarly, Gerhardt and Brown (2006) illustrated that individuals who experienced high negative arousal interpreted difficulties or challenges they encountered during training as signs that they were incapable of successfully mastering training.

In conclusion, affect acts as one source of information (amongst others) that individuals use to assess personal competence. Forgas (2003, p. 602) concludes in his authoritative chapter in The Handbook of Affective Sciences that “most of the research suggests a fundamental
affect-congruent pattern: positive affect improves, and negative affect impairs, the value of self-conceptions”.

It was pointed out in the previous chapter that individual factors represent distal, domain-independent individual capabilities and are indirect in their relationship to decision making. The next subsection reviews the individual variables of cognitive ability and social self-confidence that reflect a rough estimate of the upper limit of individual attentional resources that can be devoted to MDM. Further, MDM was conceptualized as a dual process that represents a task (i.e., substantive) cognitive process and a contextual social process. Consequently, it can be argued that the strongest effects of cognitive ability are on the application of a systematic-comprehensive process and that social self-confidence impacts on exercising control over the social-political context. The next subsection reviews the empirical evidence of the independent functional relations of cognitive ability and social self-confidence in the prediction of the quality of MDM processes (as illustrated in Table 2.1). Additionally, existing research on the joint contributions of distal individual variable factors (i.e., cognitive ability and social self-confidence traits) and self-efficacy beliefs to the prediction of general work performance and decision making is reviewed.

**Distal Individual Variable Factors**

It was pointed out in Chapter Two that the dynamic nature of decision making can be observed in the time-ordered effects and multiplicity of constituent variables that impact MDM. Individual variable differences represent more distal influences in the prediction of the quality of MDM processes. The term distal implies that these factors are general and domain-independent individual variables that typically represent ability and trait constructs (Austin & Klein, 1996; Kanfer & Ackerman, 1989, 1996; Kanfer, 1990; Kanfer & Heggestad, 1997). In the following subsections the empirical evidence regarding the independent contributions that cognitive ability and social self-confidence traits make to the prediction of MDM is reviewed.

*Cognitive Ability*

The association between cognitive ability and performance is among the most well-established predictions in the existing literature (Chen et al., 2000; Schmidt & Hunter, 1998,
A number of meta-analytic studies have reported that cognitive ability significantly predicts performance (Bertua et al., 2005; Judge et al., 2007; Schmidt et al., 2008). Schmidt and Hunter (2004), in a review of the research evidence illustrate that cognitive ability predicts both occupational level attained and performance within one’s chosen occupation and does so better than any other ability, trait, or disposition as well as better than job experience. The magnitude of the relationship between cognitive ability and performance is however moderated by occupational group. These occupational groups include professional, scientific, and upper management jobs, complex technical jobs such as computer-systems trouble shooting or complex manufacturing jobs, skilled workers, technicians, mid-level administrators, paraprofessionals, and semi-skilled work. Occupational groups that entail greater information-processing demands (complexity) showed stronger or more direct relations (Gottfredson, 2002; Hunter & Hunter, 1984; Schmidt & Hunter, 1998). These effect sizes for high complexity jobs (professional, scientific, and upper management jobs) are in the order of 0.58 which is rare in psychology and large for the social sciences.

Individuals with low cognitive ability were shown to react more strongly to perceptions of task difficulty because they had fewer attentional resources (Yeo & Neal, 2008). Conversely, when they appraise a task as difficult, high cognitive ability individuals with a higher source of attentional resources deploy smaller amounts when compared to their counterparts. Schmidt and Hunter (1998) note that it is possible that individuals with low cognitive ability would perceive tasks as being more difficult whereas those with high cognitive ability would judge the same tasks as less difficult. This relationship between perceived difficulty and the subjective experience of attentional effort was confirmed in a study of air traffic controllers by Yeo and Neal (2008). Consequently, a stronger positive relationship between cognitive ability would exist at higher levels of task complexity and the relations of cognitive ability with performance become stronger or more direct or both as task complexity increases (Chen et al., 2001; Kanfer & Ackerman, 1989).

Complex decision making tasks demand a higher level of general cognitive ability (Hollenbeck, LePine, & Ilgen, 1996) and various studies have demonstrated that cognitive ability is important for decision making (e.g., Bartram, 2005; Conway, 2000; McDaniel et al., 2001; Parker & Fischhoff, 2005; Schmidt et al., 2008; Stanovich & West, 2000; Weekley &
Ployhart, 2005). In fact, the lack of cognitive ability impairs making high quality decisions in ambiguous circumstances and contributes to managerial failure (see, for example, Lombardo et al., 1988). More specifically, verbal and numerical abilities reveal a strong relationship with analyzing/interpreting competencies (i.e., analytical and inferential competence) (Bartram, 2005). Peters et al. (2006) have provided evidence that greater numerical and quantitative reasoning is associated with more accuracy in making decisions.

In contrast to these findings, Chan and Schmitt (2002) and Howard and Choi (2000) reported a small degree of common variance between cognitive abilities and MDM. The effects of cognitive ability on job performance are largely indirect through its effect on job knowledge. Schmidt, Hunter and Outerbridge (1986), in a study of 1474 path analyses, demonstrated that job experience led to the acquisition of skills, techniques and methods that directly produced improvements in performance. Further, cognitive ability led to an increased acquisition of job knowledge, and this effect was stronger than the direct impact of ability on work sample performance. Quiñones, Ford and Teachout (1995), in a meta-analysis of work experience as a moderator \((N = 25911; K = 44)\), revealed an estimated population correlation of 0.27 between experience and performance after correcting for sampling error and criterion unreliability. In addition, work experience had the highest correlation with hard (e.g. work samples) as opposed to soft (e.g., ratings) measures of job performance. Consistent with the above, a simulation study with 200 undergraduate students by Palumbo, Miller, Shalin and Steele-Johnson (2005) demonstrated that job knowledge is the mechanism through which cognitive ability influences performance.

**Cognitive ability and self-efficacy beliefs**

Bandura (1997, 1999) argues that self-efficacy beliefs mediate the influence of distal variables in predicting performance since self-efficacy beliefs represent the mechanism through which such generalized tendencies manifest themselves. Bandura (1997, p. 2) stated in this regard that "people's level of motivation, affective states, and actions are based more on what they believe than on what is objectively true. Consequently, individuals are typically guided by their beliefs when they engage in work since their perceptions help determine what they do with the knowledge and skills they have. It is however less clear whether ability has a direct
influence, an indirect influence through its effects on self-efficacy, or if both direct and indirect effects exist.

It has been proposed that distal individual differences (e.g., cognitive ability and personality traits) influence the formation of self-efficacy beliefs (e.g., Gist & Mitchell, 1992). At a simple level, Kanfer and Ackerman (2005) stated that self-efficacy beliefs may be a threshold variable that determines whether the individual chooses to engage (i.e., deploy attentional resources) in a task. In this regard, Mitchell and Daniels (2003, p. 227) state that “actual ability can influence your behavior, and knowledge of your ability can influence your motivation, which can influence your behavior”. Moreover, because self-efficacy beliefs are construed as a more proximal (i.e., task- and situation-specific) construct, it has been proposed that self-efficacy beliefs act as a key mediator of the cognitive ability–performance relationship (Austin & Klein, 1996; Kanfer, 1990; Martocchio & Judge, 1997; Phillips & Gully, 1997). Despite these theoretical arguments, only limited empirical research has directly tested whether self-efficacy beliefs mediate the cognitive ability–performance relationships.

Eyring, Johnson and Francis (1993) demonstrated that cognitive ability correlated significantly with self-efficacy beliefs (in cross-level units-of-analysis) in the skill acquisition of individuals working in a laboratory air traffic control simulation. In support of this notion, learning has also been related to the self-efficacy beliefs of high cognitive ability individuals but unrelated to the self-efficacy beliefs of low cognitive ability individuals (Bell & Kozlowski, 2002). Also, consistent with previous research (e.g., Bandura, 1986, 1997), Mangos and Steele-Johnson (2001) demonstrated a positive correlation between cognitive ability and self-efficacy beliefs. Chen et al. (2000) illustrated that self-efficacy beliefs fully mediated the cognitive ability–performance relationship; however Martocchio and Judge (1997) demonstrated that self-efficacy beliefs failed to mediate this relationship. Also, whereas Phillips and Gully (1997) reported a positive correlation between cognitive ability and self-efficacy, a study by Ford, Quiñones, Sego, and Sorra (1992) found a negative correlation between these variables.

These contradictory findings suggest the possibility of a critical pathway of how cognitive ability influences self-appraisals of ability. In fact some evidence suggests that an interaction effect between cognitive ability and self-efficacy beliefs is possible (Judge et al., 2007). Stajkovic and Luthans (1998b) also argue that individuals may be less likely to accurately assess their self-efficacy beliefs for complex tasks, which results in an inaccurate
allocation of resources when performing such tasks (see, for example, Cervone & Peake, 1986). Second, because complex tasks involve more distal outcomes than simple tasks, self-efficacy beliefs have a more indirect influence on complex tasks (e.g., through task-knowledge acquisition processes; Bandura, 1997; Cervone et al., 1991). Thus, despite the presumption in the literature that self-efficacy beliefs represent the mechanism through which cognitive ability manifests itself (i.e., mediating effect), self-efficacy beliefs may be more a moderator of the effects of cognitive ability. Thus, self-efficacy beliefs may interact with cognitive ability in the prediction of decision making in managers such that high self-efficacy beliefs are more beneficial for managers with high cognitive ability.

It was pointed out earlier that decisions in organizations are products of compromises based on elaborate social encounters (i.e., negotiating and bargaining) in an attempt to advance interests and thereby influence final decisions. Further, social self-confidence traits are likely to contribute to the quality of MDM processes above and beyond that accounted for by cognitive ability alone. Moreover, although cognitive ability and social self-confidence traits are empirically and conceptually distinct, they are related in a temporal order in MDM. In fact, Russell (2001) demonstrated that cognitive abilities helped short-term business execution and that social influence predicted subsequent longer-term performance trends amongst executives. The next subsection reviews the empirical evidence of the relationship between personality traits and social skills and their contribution to MDM.

Personality Traits and Social Abilities

Extant research demonstrates that extraversion is consistently linked to greater sensitivity to positive or rewarding stimuli. Larsen and Ketelaar (1991) provided experimental support for Costa and McCrae’s (1980) argument that extroverted traits contribute to positive affect although they do not generally appear to reduce the unpleasantness of adverse circumstances. Extravert traits however also demonstrate an inverse correlation with affect. For instance, a negative–extraversion link may exist in situations in which the affective or social aspects of a situation are made more attentionally salient to suggest that affiliative bonds (or lack thereof) between people are sufficient to induce greater negative affect in extraverts (Hutcherson, Goldin, Ramel, McRae, & Gross, 2008).
Barrick and Mount (1991), in a meta-analytic study of 162 samples from 117 studies, demonstrated that extraversion was a valid predictor (across the criterion types) of managerial performance. One of the findings of a meta-analytic analysis of 29 validity studies (N= 4861) from the UK, European countries, Turkey, Middle East, South Africa, the Far East and the USA, across different industries, also confirmed that leading and deciding (i.e., taking control, initiating action, giving direction, and taking responsibility.) correlated with extraversion (Bartram, 2005). Optimistic, outgoing, and talkative individuals (i.e., those who display extraverted and socially confident traits) accounted for higher performance in settings that required interaction with others (Barrick & Mount, 2005; Barrick, Mount, & Judge, 2001; Barrick, Stewart, Neubert, & Mount, 1998; Craik et al., 2002; Mount, Barrick, & Stewart, 1998). Judge and Illies (2002), in a quantitative review that included 150 correlations from 65 studies, illustrated that extraversion was also a moderately strong correlate of self-efficacy beliefs. This was particularly noteworthy given that positive affect is characteristically a hallmark of extraverts, who also display confidence in their social abilities. Additional evidence from Judge, Bono, Illies and Gerhardt (2002) showed that extraversion was the most consistent correlate of leadership across study settings, where leadership was defined as whether (or to what degree) an individual is viewed as a leader by others and regarded as being able to influence their subordinates.

Ones, Dilchert, Viswesvaran and Judge (2007), in a comprehensive summary of published meta-analyses on the Big Five personality traits, reported that personality variables measured at the Big Five level are predictive of interpersonal behaviours and teamwork. Specifically, a study by Ones, Hough, and Viswesvaran (1998) (N = 11009) illustrated that extraverted traits are important for managerial work. Thoms, Moore and Scott (1996) in their study of the Big Five also demonstrated that individuals who are assertive, sociable, and energetic and who are dependable, responsible and achievement-oriented believe that they can perform the tasks necessary to operate successfully in self-managed work groups. These traits significantly accounted for the variance in self-efficacy beliefs for participating in self-managed work groups.

Political skill, which reflects a composite of sociability, dominance, ambition, positive emotionality and excitement-seeking, was shown to have a significant positive correlation with extraversion (Liu et al., 2007). Individuals high in political skill, however, used appropriate
influence tactics in order to neutralize the ambiguity of contextual and accountability demands (Hochwarter et al., 2007). Further, three investigations by Ferris et al. (2005) reported significant correlations between ease of social influence (political skill) and upward appeal and forming coalitions. Also, social influence (operationalized as political skill) and self-efficacy beliefs show a positive linear relation (Ferris et al., 1999; Perrewé et al., 2004). Further, social astuteness as a dimension of political skill, also displayed a strong correlation with political savvy, which has been demonstrated to be a significant and positive predictor of rationality (Kolodinsky et al., 2007). Other than a potent influence tactic, politically skilled individuals thus also make better decisions.

From the conceptual and empirical research it has been pointed out that accurate decisions are positively related to a systematic-comprehensive process (i.e., task performance) and negatively related to acquiescence in order to gain favours to meet the self-serving interests of dominant coalitions that are embedded in the political context (i.e., contextual performance; Motowidlo et al., 1997). Cognitive ability contributes to contextual performance through its effects on personality traits as individual characteristic adaptations. Ferris et al. (2005) and Ferris et al. (2001) empirically demonstrated that social influence and cognitive ability display a non-significant correlation. Social self-confidence is however not subsumed by cognitive ability in performance and the latter authors suggest that each is related to a different type of flexibility. Cognitive ability may be associated with cognitive flexibility, whereas social influence may be most closely associated with interpersonal effectiveness.

As shown earlier, the subjective appraisal of context moderates the behavioural expression of a trait. For example, in a study of adult workers, Hochwarter et al. (2006) revealed that low organizational support as a contextual cue activated the expression of social traits to enlist cooperation and acquire the resources needed to meet performance expectations. Further robust findings of trait activation are reported in a large-scale investigation of the convergent and discriminant validity findings obtained in assessment centers (Lievens et al., 2006). Findings from this latter study confirmed that ratings in assessment centre simulations converged to relevant and specific personality traits. Unfavourable appraisals of the context may, however, inhibit trait expression (e.g., cognitive withdrawal and unwillingness to deploy attentional resources). For example, in a study with 80 adults, Hill (1989) demonstrated that ambiguity within a social situation together with low self-efficacy beliefs affected individuals’
willingness to expend effort (i.e., deploy attentional resources) to enact social behaviours (see also Stevens & Gist, 1997; Treadway et al., 2005).

Confidence

Confidence is a relatively stable individual disposition to meet challenging task demands in a wide variety of situations (Bandura, 1997). Wolfe and Grosch (1990) reported that the accuracy of individuals’ decisions showed little stability across tasks whereas their confidence in these decisions showed a fair amount of consistency. This pattern of coefficients suggests that individuals exhibit consistent patterns of individual self-enhancing illusions, such as unrealistic optimism. Taylor and Brown (1988) hypothesized that unrealistic optimism is predictably associated with positive affect, social skills, and intellectual functioning. To test this hypothesis, Wolfe and Grosch (1990) obtained data from 162 undergraduate students and demonstrated support for Taylor and Brown's hypothesis. As reported earlier, Larrick et al., (2007) illustrated that higher perceptions of ability predicted greater degrees of overconfidence, and this relationship held across individuals and across ability domains. Levels of confidence that lead individuals to infer that they have more talent than others thus mediate choices and judgments.

Empirical and anecdotal evidence attests to the contribution that confidence makes to decision making in management. A confident disposition impacts on managers’ competence in interaction (Bartram, 2005). This is confirmed in a study based on a sample of 1464 male and female top, senior, and middle-level managers and professionals working in organizations in two large UK public sectors (Alimo-Metcalfe & Alban-Metcalfe, 2001). Similarly, confidence accounts for making risky decisions in competitive decision contexts (Haleblian et al., 2004). Moreover, confident negotiators are shown to achieve better outcomes (Stevens & Gist, 1997; Sullivan et al., 2003), whereas individuals who display self-doubt delay decisions (Ferrari & Dovidio, 2001; Frost & Shows, 1993). Indecisiveness is associated with a higher threshold for certainty before making a decision (Frost & Shows, 1993). Consequently, the extent of one’s confidence is critical to effective decision making and individuals with greater confidence display lower self-doubt, whereas those who doubt their decisions are linked to apprehensiveness about the fallibility of their judgment and about the possibility of being wrong (Mirels et al., 2002). They thus needlessly hesitate, defer to others, or otherwise prevent
others from discovering their inability to identify sound courses of action (Parker & Fischhoff, 2005).

Affective reactions are potent indicators for the activation of social self-confidence as demonstrated by dominance, sociability, and energy level (i.e., available attentional resources). Social self-confidence is thus inversely related to the availability of attentional resources. Interpersonal influence and social coordination require effortful energy (see, for example, Finkel et al., 2006) and individuals who are self-confident select effortful rational modes of social influence (e.g., Sullivan et al., 2003; Wayne et al., 1997), whereas individuals with less self-confidence view interpersonal requests and negotiation as potential threats to be avoided (e.g., Forgas & Laham, 2005; Mirels et al., 2002). Unfavourable appraisals of the context may, however, inhibit social self-confidence trait expression (e.g., Hochwarter et al., 2006; Lievens et al., 2006; Tett & Burnett, 2003; Tett & Guterman, 2000) and contribute to: avoidance (e.g., Anderson, 2003, 2007); decisional procrastination (e.g., Ferrari, 2001; Ferrari & Dovidio, 2000; Ferrari & Pychyl, 2007; Van Eerde, 2000); biased decision processes in a direction consistent with others’ opinions to satisfy valued social goals (e.g., Chen et al., 1996; Lerner & Tetlock, 2003); and evasion, escape or adopting the status quo option (e.g., Luce, 1998).

In Chapter Two it was pointed out that distal individual differences make time-ordered and different contributions in their functional relations to MDM. The application of a rational, systematic-comprehensive decision-making process requires the application of cognitive abilities, whereas the ease and willingness to initiate and participate in social influence relies on social personality traits. Cognitive ability and social personality traits therefore represent the two broad ‘generalizable predictors’ that reflect the ‘can do’ distal individual differences for the quality of MDM processes. Self-efficacy beliefs, in contrast, represent a proximal (i.e., task- and situation- specific) motivational construct through which effortful control of attention and affect regulation is manifested. Consequently, self-efficacy beliefs reflect a measure of the ‘will do’ processes that mediate between distal individual differences in the prediction of the quality of MDM processes.

**Individual Variables and Self-Efficacy Beliefs**

Earlier it was pointed out that cognitive ability significantly predicts performance through a number of factors that moderate the relationship between cognitive ability and
performance. Cognitive ability has been shown to be important for the decision making of managers. In addition, personality and social traits were shown to contribute incremental validity in the prediction of performance above and beyond that accounted for by cognitive ability. Although there is evidence that individual variables and self-efficacy may each offer significant predictive value in relation to complex performance, they have by and large been examined in isolation from each other. To date few studies have estimated the independent contributions of distal individual differences (cognitive ability and social self-confidence traits) in combination with proximal self-efficacy beliefs, as well as the concomitant mediated differences in affect in order to predict performance or examine the communalities among these constructs. In one study by Phillips and Gully (1997) there was strong support for a model linking individual personality traits, ability, self-efficacy, and goal processes into a common framework that explained and predicted individual academic performance. Ackerman et al. (1995) also demonstrated that distal cognitive abilities accounted for the major share of predicted individual differences in air traffic control performance. They demonstrated that self-efficacy beliefs provided no significant contribution to performance that was not accounted for by task-related affect. The magnitude of the relationship between cognitive ability and self-efficacy beliefs was demonstrated to vary with task complexity (see, Chen et al., 2001; Judge et al., 2007). Consequently, the contribution of self-efficacy beliefs to the prediction of performance might be smaller for high cognitive ability individuals but larger for low cognitive ability individuals.

There are even fewer studies that have investigated the independent and combined contributions of individual variables and self-efficacy beliefs to predict the quality of MDM processes. In fact, Hiller and Hambrick (2005) have commented that, although a substantial amount of research on managers has been conducted over the last 20 years, scholars still only possess a fragmented understanding of the antecedents and implications of managerial behaviours such as resourcefulness, decisiveness, dominance, independence, and social presence. The lack of information on how self-efficacy beliefs mediate the relationships of particular distal individual variable factors in scientific models has, consequently, contributed to a lack of progress in theory building.

Notwithstanding this limitation, a few studies warrant attention in the light of the purpose of this thesis. Motivation is central in the definition of conscientiousness as a construct
and self-efficacy beliefs represent the mechanism through which the generalized tendencies of conscientiousness manifest themselves (Martocchio & Judge, 1997). Conscientiousness includes taking initiative, persistence in applying extra effort and dependability in completing tasks. It has been demonstrated to be one of the most generalizable predictors of individual differences in performance (Mount & Barrick, 1995). This was consistent with earlier findings by Barrick and Mount (1991). On the basis of data from 146 managers, Barrick and Mount found that conscientiousness was a valid predictor of various job-related criterion types (job proficiency, training proficiency, and personnel data) across five occupational groups (professionals, police, managers, sales, and skilled/semi-skilled). Further, these authors reported significant relationships between conscientiousness and supervisor-rated job performance. Their results indicated that two variables of individual difference, that is conscientiousness and extraversion, were significantly related to job performance. Moreover, the relation between conscientiousness and extraversion was greater for managers with higher autonomy compared to managers with lower autonomy within their jobs.

Consequently, managers who apply effort and are persevering (i.e., conscientious) and those who are sociable, outgoing, and assertive (i.e., extraverted) are likely to perform better when awarded autonomy and discretion in selecting the appropriate work behaviours to be performed. Consistent findings by Judge and Ilies (2002) confirm that conscientiousness is a strong correlate of leadership. Self-efficacy beliefs, in turn, significantly influence conscientiousness as shown in a number of studies (Chen, Gully, & Eden, 2001; Judge & Ilies, 2002; Judge et al., 2007; Thoms, Moore, & Scott, 1996). Individuals with high self-efficacy beliefs are more conscientious and are more likely to set goals and to display higher expectations that their efforts will result in favourable consequences.

McHenry, Hough, Toquam, Hanson and Ashworth (1990) investigated the joint relationships between various cognitive and personality trait composite scores and five components of performance, using enlisted soldiers in nine US Army occupations. Their findings revealed that the best prediction was obtained when both cognitive ability and personality traits were combined to predict effort and leadership performance. Personality trait composites were also the best predictors of individuals putting in extra effort, supporting peers, and exhibiting personal discipline. In another study of ninety-three trainees across two weeks of skill acquisition practice on a complex, air traffic controller simulation task, Ackerman et al.
(1995) demonstrated that distal cognitive abilities accounted for the major share of predicted individual differences in performance (approximately 30% to 45% of the variance in performance). Proximal self-report measures (i.e., personality and conative traits, vocational interests and self-estimates) and affect accounted for a small and insignificant amount of variance in performance. Moreover, self-efficacy beliefs, as assessed prior to task engagement, provided no significant contribution to the prediction of individual differences in performance that was not accounted for by the frequency of affect. The proximal measures of negative and positive affect and self-efficacy were, however, related to task performance.

In a similar vein, Judge et al. (2007) investigated the joint influence of self-efficacy beliefs and distal individual factors on general work performance. The regression and path analyses revealed that, when self-efficacy beliefs were entered into the equation with the distal variables (i.e., cognitive ability, Big Five traits and experience), the coefficient was non-significant, whereas cognitive ability, conscientiousness and experience predicted performance. When all these variables are controlled self-efficacy beliefs accounted for no improvement in the prediction of performance. In addition, cognitive ability significantly influenced self-efficacy beliefs, conscientiousness, extraversion, emotional stability and experience. Thus, cognitive ability, conscientiousness and experience influenced work-related performance but self-efficacy beliefs did not significantly influence performance.

These findings suggest that the incremental validity of self-efficacy beliefs on task and especially job performance was substantially attenuated by the inclusion of distal individual differences. The incremental validity of self-efficacy beliefs may thus overstate its true unique effect on performance. The incremental contribution of self-efficacy beliefs is thus insignificant when distal individual differences are taken into account in the prediction of job performance. In fact, the incremental validity of non-cognitive abilities in the presence of cognitive ability may be far less than previously thought. For instance, Schmidt et al. (2008), in a meta-analysis of 2057 studies demonstrated that the incremental validity of personality traits is smaller (less important) relative to cognitive ability than previously believed.

A plausible argument is that the incremental validity of cognitive ability is stronger when compared to distal personality traits and the proximal influence of self-efficacy beliefs when individuals are faced with broader and complex tasks. It is noteworthy that a large and consistent distinction among occupations is the complexity of their information processing
demands. Task complexity correlates with processing skills, such as compiling and combining information, reasoning and analyzing, decision making, negotiating and persuading (Gottfredson, 2002). Consequently, the relationship between cognitive ability and performance become stronger or more direct or both as complex information processing in tasks increases. Task complexity is thus an important moderator of the joint relationship between cognitive ability, personality traits and self-efficacy beliefs in the prediction of performance and also, by implication, MDM.

However, individuals’ perceptions of their abilities as they relate to diverse domains of performance may mediate ability-performance relations in complex ways. This is particularly the case when successful performance involves the regulation of effortful attention (i.e., conscientiousness and persistence) and affect. Self-efficacy beliefs are dynamic dispositions and differ from static global traits in that they reflect the likelihood of successful performance in a specific task, measured immediately before any effort is expended on the task (Bandura, 1997). In this regard, in a review of self-efficacy beliefs and their relationship with sport performance, Moritz et al. (2002) illustrated that the most important moderator was that of concordance, that is the match between measures of self-efficacy beliefs and performance (see also, Gist, Stevens, & Bavetta, 1991; Lucas et al., 2006; O'Connor & Arnold, 2001; O'Connor et al., 2005; Oeij, 2006; Smith & Betz, 2000; Weigand & Stockham, 2000; Xie, 2007).

Further, Bandura (1997) stated that the structure of the relationship between self-efficacy beliefs and action requires that both tap similar capabilities. By implication, self-efficacy beliefs thus reflect individuals’ momentary belief in their capability to perform a specific task at a specific level of performance. Measures of self-efficacy belief thus serve as another potential moderator in the prediction of specific performance (Bandura, 1997; Gist & Mitchell, 1992). This notion fits with the bandwidth–fidelity debate that suggests that the use of broad decontextualized individual and self-efficacy belief measures focus more on the characteristic responses that individuals make to broad environmental demands than on context- and task-specific performance. Although broad measures (i.e., composite measures) offer greater bandwidth and higher cross-situational replication to the prediction of broad performance criteria, they are less likely to predict specific performance criteria.

To enhance prediction Hogan and Holland (2003), Hogan and Roberts (1996) and Ones and Viswesvaran (1996) proposed that validity is enhanced when the bandwidth of predictors
and criteria are matched. In fact, broadband predictors assess global criteria better than specific criteria and vice versa (see, for example, Erez & Judge, 2001). In this regard, self-efficacy beliefs, given their relatively domain-specific nature, are patterned differently across individuals and spheres of activity and are likely to be a stronger predictor of narrow performance measures (Bandura, 1999) and thus decisional performance.

Summary

The preceding review can be summarized as:

- Cognitive ability and social self-confidence personality traits are empirically and conceptually distinct individual differences.
- Cognitive ability exerts its strongest effects on the application of a systematic-comprehensive process and social self-confidence impacts on exercising control over the social-political context.
- Individuals with a high cognitive ability possess a higher source of attentional resources to deploy.
- Cognitive ability displays a stronger direct positive relationship with decision complexity.
- Personality and social traits contribute incremental validity in the prediction of performance above and beyond that accounted for by cognitive ability. Also, social self-confidence traits and self-efficacy beliefs show a positive linear relation.
- Social self-confidence as demonstrated by dominance, sociability, and energy level (i.e., available attentional resources) are related to the availability of attentional resources and individuals who are self-confident select effortful rational modes of social influence.
- Notwithstanding the conclusion from studies, the effects of self-efficacy beliefs and personality traits are constrained by the inclusion of cognitive ability as an individual difference factor.
- Self-efficacy beliefs and appraisals shape influence the type and intensity of affect as well as the cognitions that determine affective responses.
Although non-cognitive measures are shown to provide little incremental validity in accounting for variance in individual performance, incidents of proximal negative and positive affect consistently add significant incremental prediction of differences in individual performance. One question posed by the present research was thus to determine whether cognitive ability, self-efficacy beliefs and social self-confidence independently account for the prediction of decision-generated affect in MDM. The next subsection reviews research on how affect shapes the quality of decision processing and acts as a motivator in decision behaviour.

**Decision-Generated Affect**

Pham (2007) observed that the empirical literature on affect and rationality is fragmented and seemingly inconsistent. Attempts to incorporate the wide empirical base regarding affect in decision making into a single, parsimonious framework may thus be overly ambitious (see, for instance, Raghunathan & Pham, 1999), indeed a challenge the present researcher faced. The study of the relationship between affect and decision making is multifaceted (Baumeister et al., 2007; Baumeister et al., 2007; Han et al., 2007; Pham, 2007; Pfister & Böhm, 2008; Schwarz & Clore, 2003, 2007) as illustrated in Table 2.1 in Chapter Two. The empirical generalizations presented in the next subsection review affect as information that impacts on the comprehensiveness of deliberation and act as a motivator of information processing and behaviour in decision making.

**Affect as Information**

Decision making is neither a dispassionate process nor one driven solely by the desire to maximize self-interest (Bandura, 1997; Shafir & LeBoeuf, 2002; Simon, 1998). Decision making requires information for evaluation and deliberation about alternatives, and individuals use their perceived affect as relevant information in their judgments. In many decisions affect may be the most useful information an individual has (Raghunathan & Pham, 1999). The impact of affect on decision making is, however, a function of its perceived informational value. Rather than affect itself, the information conveyed by affect is crucial. Affective cues influence judgments directly by serving as experiential and bodily information regarding how one feels and such experiential information can be faster and more compelling than thoughts
(Clore & Huntsinger, 2007). This has been acknowledged by many researchers, albeit with varying emphasis (Baumeister et al., 2007; Gasper & Isbell, 2007; Han et al., 2007; Isen & Labroo, 2003; Lerner & Tiedens, 2006; Loewenstein & Lerner, 2003; Loewenstein & O’Donoghue, 2007; Loewenstein et al., 2001; Pfister & Böhm, 2008; Schwarz & Clore, 2003; 2007).

Individuals reach good-bad assessments in a rapid, automatic, and relatively effortless manner. In a series of seminal papers with titles such as "Feeling and Thinking: Preferences Need No Inferences" (1980) and "On the Primacy of Affect" (1984), Zajonc presented the results of studies which demonstrated that individuals can often identify their affective reaction to something more rapidly than they can even say what it is. Affective signals, originating in bodily states and acquired by learning from previous experiences, act as markers about the valence (positive or negative) of immediate experiences and operate automatically, influencing decisions even before a deliberate intention is generated (Damasio, 1994). Damasio documented the negative consequences of being unable to use affective feelings as information for making everyday judgments and decisions. Further, Damasio and colleagues (Bechara, Damasio, Tranel, & Damasio, 1997; Shiv, Loewenstein, Bechara, Damasio, & Damasio, 2005), in an influential series of studies, illustrated that individuals with affective deficits related to damages in the ventromedial prefrontal cortex area displayed impaired decision making, not just in laboratory tasks, but also in decision making in general. Consequently, Damasio (1994) reasons that a reduction in emotion may constitute an important source of irrational behaviour.

The informational influence of affect also impacts on social judgments, as evidenced in numerous studies (Forgas & George, 2001; Forgas & Laham, 2005; Forgas, Kipling, & Laham, 2004; Schwartz & Clore, 2003, 2007). For instance, Forgas (1998, 2002) illustrated that affective information impacted on deliberations prior to complex, unpredictable social encounters (such as the formulation of and responses to requests), as well as on the use of persuasive arguments in negotiation and bargaining encounters. In a review of studies by Finucane et al. (2003), there was evidence to demonstrate that individuals rely in part on their affect to recognize the best option in decision situations. For example, Slovic, Finucane, Peters and MacGregor (2002) investigated the inverse relationship between risk and benefit judgments under conditions designed to limit the use of analytic thought and enhance the use of affect as information (‘the affect heuristic’). As expected, individuals relied on an affect heuristic when
the opportunity for analytical deliberation was reduced and an efficient mode of judgment was needed. Similarly, Finucane et al. (2000) conducted experiments designed to manipulate affect by increasing or decreasing both perceived risk and perceived benefit. In each experiment there was no apparent logical relationship between the information provided (e.g., information about risks) and the non-manipulated variable (e.g., benefits). Their data demonstrated that risk and benefit judgments were constructed, at least in part, by reference to some overall affective evaluation.

The extent or type of affect (e.g., weak versus strong affect) focuses the decision maker on new information. Kisfalvi and Pitcher (2003) empirically demonstrated that MDM carries an essential affective component. Their research design was a single-case, longitudinal field study that focused on the top manager, the management team, and team dynamics. Data collection included interviews, direct observations, documents and archival materials, as well as participants’ descriptions over a nine month period. Their findings illustrated that, in making decisions, individuals tended to do what feels right (‘an emotional heuristic’). Affective information aided in the selection of a ‘rational’ solution and played an important part in MDM by acting as a decision heuristic.

The effects of affect on managerial perceptions were measured among 149 managers from a variety of industries and companies. It was found current managerial mood state influenced the way managers perceived the amount of information they gathered when making business decisions relative to colleague managers, the amount of time they spent gathering information relative to comparable managers, and their own willingness to undertake risky business propositions relative to similar managers (Williams, 2004).

The importance of affect as information was also highlighted for risk perceptions and risk-related decisions. In a stock investment simulation, stock investors rated their feelings on an internet website, while making investment decisions each day for 20 consecutive business days (Seo & Barrett, 2007). Contrary to the popular belief that affect influences the quality of decision making, the authors reported that individuals who were less influenced by their immediate affect in determining the level of risk in their daily stock portfolios, achieved higher daily investment returns on average throughout the simulation. Individuals anticipate how they will feel about the outcomes of decisions and use their predictions to guide their choices. Mellers, Schwartz, and Ritov (1999) provided evidence that choices between risky options may
depend on maximising the anticipated affective experience, rather than on only maximising the expected utility of the chosen outcome. Similarly, Lerner and Keltner (2000), Raghunathan and Pham (1999) and Raghunathan Pham and Corfman (2006) also illustrated that anxious decision makers preferred uncertainty-reducing decisions.

Individuals also tend to rely on affect as information even when the actual source of the affect is totally unrelated to the object of attention. In a classic study, Schwarz and Clore (1983) found that individuals mistakenly inferred that their weather-induced moods reflected how they felt about their personal lives. Similar irrational misattributions have been found in numerous studies. The puzzling effects of the weather on inducing affect as information may explain the widespread misattribution of affect within decision making. In a challenge to the hypothesis that financial and share markets are citadels of rationality, a number of studies have recorded above-average stock market performance on sunny days and below-average performance on rainy and winter days (e.g., Hirshleifer & Shumway, 2003). A plausible explanation is that sunny weather puts investors in a good mood, which they misinterpret as optimism (anticipated affect) about the share market, therefore taking more risks; rainy or winter weather puts investors in a depressed mood that they misinterpret as pessimism about the share market, therefore taking fewer risks. In addition, Simonsohn (2006) studied 682 actual university admission decisions and, as predicted, found that applicants’ academic attributes were weighted more heavily on cloudier days, and non-academic attributes more heavily on sunnier days.

S. L. Williams (1995) illustrated that much latitude exists in how individuals interpret the meaning of their affect and that individuals are notoriously poor at estimating their automatic arousal. Even if they could accurately perceive their viscera, they could be misled because of the empirically poor relationship between physiological arousal and coping capabilities (see also Feltz, 1982). The impact of decision makers’ affect on decision making can be eliminated, however, when individuals attribute affect to an irrelevant source. For example, Bhattacharjee and Moreno (2002) confirmed that the presence of available but less relevant affective information had a differential impact on decisions amongst confident auditors whereas those who doubted their ability made lower risk decisions.

Positive and negative affect also function as heuristic cues to signal whether enough effort has been exerted to perform a task (Fisher & Noble, 2000). Earlier it was pointed out that physiological and affective arousal is an important source of information that determines self-
efficacy beliefs (Bandura, 1986, van Vianen, 1999; Xie, 2007). Positive affect may thus be used to infer self-efficacy. Evidence by Maddux and Meier (1995) confirms a self-efficacy beliefs/affect covariation and other studies have shown that the more intense induced affect, the greater is its impact on self-efficacy beliefs (Forgas, Bower, & Moylan, 1990; Salovey & Birnbaum, 1989). For instance, Kavanagh and Bower (1985) demonstrated that experimentally induced negative affect diminished self-efficacy beliefs across different spheres of functioning, whereas positive affect enhanced perceived self-efficacy beliefs in performance. In a study of 62 undergraduates, Cervone and Peake (1986) illustrated that the same affective heuristic process that influences judgments of factual and social information might be integral to forming judgments about self-efficacy beliefs. In their study, randomly assigned competence biases created highly significant differences between the low- and high-affect heuristic conditions that impacted on measures of self-efficacy beliefs and persistence.

It was pointed out earlier that the relationship between affect and self-efficacy beliefs is reciprocal, with self-efficacy beliefs exercising a greater influence on affect than that exercised by affect on self-efficacy beliefs (i.e., asymmetrical). In fact, in a study by Cervone, Kopp, Schaumann, and Scott (1994) affect was shown to have no influence on self-efficacy beliefs. In their series of experimental studies with undergraduates, induced affect of a negative nature evoked higher personal standards for performance, and participants’ confidence in their capabilities remained unaffected by the mood inductions. The authors concluded that meeting or not meeting minimal performance standards naturally evoked assessments of affective reactions of satisfaction or dissatisfaction with prospective performances.

In conclusion, affect provides speed in its ability to facilitate reasoning, but it is also limited by its dependency on context and experience, thus allowing individuals to be led astray or manipulated, inadvertently or intentionally, into making poor choices (Slovic et al., 2002). Although affect has a direct effect on decision processing, its effect is mediated by individual differences in the level of self-efficacy beliefs. The next subsection reviews the empirical evidence of the impact of affect in decision processing.

Affect and Decision Processing

Affect can take precedence over cognitive scrutiny and rationality in decision making (Baumeister et al., 2007; Pham, 2007), causing individual goals to shift from that of effort and
accuracy towards that of minimizing negative affect (i.e., to feel better) (Luce et al., 1997). Numerous studies confirm a relationship between positive and negative affect and decision making, and they illustrate that positive affect promotes beneficial decision processes and negative affect contributes to dysfunctional decision processes. The impact of affect on decision processing is however curvilinear. For example, high affective arousal restricts the breadth, search and ability to judge the usefulness of information (Bettman, Johnson, Luce, & Payne, 1993; Janis & Mann, 1977; Rothstein, 1986). Consequently, individuals who experience negative affect make faster and less discriminate use of information (Luce et al., 1997) and adopt simplifying (heuristic) decision processes (e.g., Payne, Bettman, Coupey, & Johnson, 1992; Payne et al., 1993). Similarly, Maule et al. (2000) illustrated that time-pressured participants increased the proportion of overall decision time they devoted to processing general information in order to develop a broad understanding of the decision problem rather than making a detailed evaluation of particular alternatives and their outcomes. This is consistent with Payne et al. ’s (1993) findings which indicated that individuals prefer to have a relatively small amount of information about all alternatives rather than detailed information about a few of them when subjected to negative affect. On the whole, these findings suggest that decision makers adjust their decision processes to ‘easier’ strategies by altering their processing to reduce experienced negative affect.

On the other hand, negative affect also promotes greater attention to detail and promotes detail-oriented processing (for a review see, Payne et al., 1993, and Schwarz and Clore, 2003, 2006). Consistent with the finding that negative affect fosters a more detail-oriented processing style, Luce et al. (1997) observed that decision processes under increasing negative affect become more extensive. Schwarz (1990) argued that negative affect signals that one's current situation is problematic, thus evoking an effortful, analytical decision-process strategy. Negative affect may thus relate positively to effort on tasks that are immediately required and may therefore operate as an incentive to make an accurate decision (Foo et al., 2009). Further support from Luce, Bettman and Payne (1997) illustrated that negative affect simultaneously signaled decision importance and encouraged the kind of decision processing associated with maximizing accuracy (i.e., a systematic-comprehensive process).

Recent studies have also revealed more nuanced effects that specific negative affect has on decision processes. For example, fearful individuals make relatively pessimistic and risk-
aversive choices, whereas sadness results in high-risk, high-reward choices (Raghunathan & Pham, 1999; Raghunathan et al., 2006). Studies by Lerner and Keltner (2000) demonstrated that fear and anger influenced decision risks in opposite ways: fearful individuals made pessimistic judgments about future events, whereas angry individuals made optimistic judgments. Lerner and Tiedens (2006) also confirmed that anger has a similar impact on decision making, leading to increased risk taking and optimism. Consequently, while the event causing anger may be negative, the effects on subsequent experience (a sense of ability to control the situation through increased energy) suggest that anger may in fact be a positive affect, especially in the sense of motivating future actions.

Anxiety, as a response to threats, with its more narrow attention focus and bias toward threatening information, prompts a goal of uncertainty reduction in risky decisions (e.g., Halebian et al., 2004; Maner et al., 2007; Raghunathan & Pham, 1999). Further, sadness, a common response to the loss or absence of a reward, prompts a preference for options that provide greater reward or comfort. Whereas fearful individuals make relatively pessimistic and risk-averse choices, sadness results in high-risk, high-reward choices (Raghunathan & Pham, 1999; Raghunathan et al., 2006). Tice, Bratslavsky and Baumeister (2001) also demonstrated that the decision processes used by sad individuals was due to participants placing a higher priority on immediately improving their affect rather than taking full advantage of the long-term gains that could be obtained by careful, rational decision making. Similarly, Lerner and colleagues (2004) demonstrated that induced sadness affected economic decisions, that is, prompted by a desire to change their sad circumstances subjects offered more money to acquire items.

Empirical evidence attests to the notion that sadness elicits self-focused attention (see, for instance, Green & Sedikides, 1999, Sedikides, 1994, and Sedikides & Green, 2000). This has an adaptive function in that sadness increases the degree to which individuals seek out detailed and diagnostic information, which fosters systematic, detail-oriented decision processes. For instance, planning and executing interpersonal behaviours typically involves a degree of elaborate information processing, and Forgas (2002) illustrated that individuals in sad moods paid more attention to the quality of arguments and used more persuasive arguments when compared to individuals with positive affect.
Conversely, positive affect indicates that the current environment is free from risk and/or presents the potential to obtain reward and that promotes cognitive flexibility, innovation, problem solving and creativity in many different contexts (see, for example, Isen & Labroo, 2003). Positive affect produces more confident, assertive, optimistic, and cooperative behaviours (see, for example, Forgas & George, 2001, and Forgas & Laham, 2005). During negotiations, positive affect promotes creative thinking which, in turn, makes negotiators more likely to engage in innovative problem solving, thereby resulting in favourable negotiated outcomes. For instance, Kopelman, Rosette, and Thompson (2006) illustrated that negotiators who displayed positive affect were more likely to persuade their opponents to accept their offers and were more likely to extract concessions from the opposing party. Further, managers’ affect influenced the way they perceived the amount of time they spent gathering information and the amount of information gathered in the process of making business decisions (S. L. Williams, 2004). Staw and Barsade (1993) illustrated that positive affect influenced the amount of information requested and found the use of quantitative information to be significantly different between MBA students with high and low affect. Similarly, Estrada, Isen and Young (1997) demonstrated that positive affect impacted on clinical decision making among practicing physicians. Positive affect also predicted superior decision making and performance in a study by Cervone and Wood (1995).

Individuals in a positive mood have been found to be more likely to voluntarily expose themselves to threatening but diagnostic information. Studies by Trope, Ferguson and Ragunanthan (2001) also illustrated that positive affect influenced the relative weight that individuals assigned to the emotional costs versus the informational benefits of receiving negative feedback. It seems that positive affect functioned as a buffer, enabling individuals to deal better with the emotional costs of negative self-related information.

Positive affect however produces a more superficial (i.e., a heuristic) decision process in that it promotes a general, schematic way of thinking that relies more on the deductive use of existing knowledge than on the inductive use of external, piecemeal information (Bless, 2000). Heuristic decision processing is, by nature, aimed at achieving anticipated valued social goals (i.e., to have a pleasant interaction). Chen et al. (1996) illustrated that impression-motivated decision processing reflected a ‘go along to get along’ heuristic that biased decision processes in a direction of complying with others’ opinions. Accountability predicaments, in particular,
evoke low-effort decision processing as mediated by anxiety. Studies have demonstrated that making a decision in the face of disagreement and then being forced to justify that decision activated different decision processes. One coping pattern is an ‘acceptability heuristic’ in which individuals acted in a manner they believed would be most likely to be acceptable to the relevant audience (Green et al., 2000; Lerner & Tetlock 1994, 2003; Tetlock et al., 1989). Individuals under such conditions avoided the ‘unnecessary’ cognitive work (i.e., search, use and deliberation about alternative courses of action) in their decision processes. How affect is appraised may cause decrements in decision making that force shifts in attentional resource allocations to an off-task, affective focus and thus dilute the comprehensiveness of decision processes (Bettman & Payne, 1997).

Empirical evidence also illustrates that a strong motivation to do well overrides the effect of negative affect on the quality of decision processes. Once a threshold level of negative affect is reached, individuals adapt their decision processes to limit the impact of affect towards a motivated systematic-comprehensive decision process (Arenas et al., 2006; Luce et al., 1999; Maule et al., 2000). In fact, Foo et al. (2009) found support for a curvilinear relationship between negative affect and effort (i.e., allocation of attentional resources) in a study of 56 entrepreneurs from 22 start-up ventures. In this study, initial negative decision-affect related positively to effort. However in terms of affect-as-information, persistent negative affect that signalled a less opportunity-affording opportunity led entrepreneurs to disengage from their ventures. Whether the experience of affect is positive or negative, therefore, depends entirely on an appraisal of the situation in which it is experienced.

**Affect and Information Processing and Decision Behaviour**

Individuals select decision strategies and choose low effort, ‘easy’ options in order to conserve finite attentional resources. In Chapter Two it was stated that it is not the sheer volume or pace of information but the ambiguity of information that matters most in MDM (Beach & Mitchell, 1978; Hambrick et al., 2005a, 2005b; Mintzberg, 1973). This subjective experience contributes greatly to complexity (e.g., Gottfredson, 2002). The process of dealing with such ambiguous or indeterminate information in decision making represents the very conditions that allow for affect infusion (Forgas, 1995), whereby affectively loaded information becomes incorporated in decisional processes and eventually biases the decisional outcomes.
A number of studies have shown that the affective results of the appraisal of certainty and control play a mediating role in determining whether individuals engage in a low effort, quick and more superficial heuristic decision process (i.e., substantive processing or System 1) or a motivated systematic, effortful, comprehensive, logic-based decision process (i.e., motivated processing or System 2) (Forgas, 1995, 2000b; Forgas & George, 2001; Kahneman, 2003; Payne & Bettman, 2007; Stanovich & West, 2000). These two modalities operate in a temporal sequence (Forgas, 1995; Forgas & George, 2001; Forgas et al., 2004) where individuals minimize effort by shifting their decision processes between open, substantive processing (processing of both affective and non-affective information) and a motivated processing (a more controlled, selective processing strategy that reduces the chances of relying on affective information) in order to limit affect infusion and subsequent biases during decision making (Forgas, 1995, 2000b, 2002, Forgas & George, 2001).

For example, Peters et al. (2006), in a series of four studies, explored how the ability to understand and transform probability numbers related to performance on judgment and decision tasks. The alternative hypothesis, that numeracy’s effect on decisions was due to cognitive ability, was not supported by these studies. Their findings illustrated that affect partially mediated the influence of numeracy in decision processing, and that performance was influenced more strongly by irrelevant affective sources. Affect thus, once elicited, can have a dynamic influence on how social information is selected, interpreted, processed, and remembered (Forgas, 1998, 2001, 2003). Jones and George (1998) also presented experimental findings concerning the role of affect in managerial information processing and decision making in order to illustrate that managers differed in the extent to which they are aware of these affective infusion effects.

A number of studies have provided substantial evidence for the mediating impact of ‘defensive’ decision processes in order to reduce the influence of affect infusion in decision processes (Forgas, 2000a, 2000b, 2003; Forgas & Ciarrochi, 2002; Forgas & George, 2001; Forgas & Laham, 2005; Sedikides, 1994). For instance, in a study with share investors on the internet, who rated their feelings while making investment decisions each day for 20 consecutive business days, Seo and Barrett (2007) demonstrated that those who were more ignorant about their affective states, and thus less able to identify them at the moment of decision making, performed more poorly due to affective infusion which they ignored.
Conversely, those individuals who experienced more intense affect achieved higher decision-making outcomes because they were better able to identify affect and distinguish between different forms of affect. As a result, they achieved better performance via their enhanced ability to control the possible biases induced by their affect.

In recognition of this, Finucane and Lees (2005, p. 2) refer to “affective fluency” as an important ability in decision making. Affective fluency is defined as the extent to which individuals appropriately balance affective information processing with deliberative analysis in decision making. Forgas and Laham (2005), in a review of the empirical evidence, including several studies from their own research, demonstrated that fleeting, superficial mood states have highly predictable and significant motivational influences on how individuals make decisions. They conclude that individual difference variables such as self-esteem (i.e., a global affective trait that reflects an individual's characteristic affective evaluation of the self) moderated the effects of affect on social judgments and behaviours. Individuals with low self-esteem displayed less certain and stable self-conceptions and were thus likely to be more influenced by situational/contextual variables. Similarly, Sedikides (1995) experimentally demonstrated no affect infusion effects for highly consolidated, central self-conceptions. Lower self-conceptions were influenced by affect because they were less elaborated and consolidated, and because they were held with lower certainty this increased the likelihood of the occurrence of affect-infusing heuristic decision processes (see also, in this regard, Sedikides & Green, 2000). The absence of a strong motivational influence (high affective self-regulation via self-efficacy beliefs) thus offers less scope to identify and distinguish among the bias-induced effects of affect in individual decision processes.

Bandura (1997) stated that self-efficacy beliefs play a pivotal role in the self-regulation of affective states. Self-efficacy beliefs enable the regulation of affective outcomes by: (1) creating attentional biases in how events are construed and cognitively represented; (2) via perceived cognitive abilities to control intrusive thoughts; and (3) by supporting effective courses of action in order to transform the environment in ways that alter its emotive potential (Bandura, 1997). Moreover, positive affect mediated by self-efficacy beliefs serves as a personal resource that enables individuals to make transitions from heuristic processing to a motivated, controlled decision process in order to deal with the emotional costs of negative self-related information.
Motivated decision processing, and its concomitant positive congruent effect, ‘protect’ managers from the possible biases induced by their affect by causing them to deliberately revisit important information in their decisions. It was pointed out earlier that affect influenced the relative weight that individuals assigned to the emotional costs versus the informational benefits of receiving negative feedback (Trope et al., 2001). Managers who have a low ability to regulate the influence of affect (e.g., who have low self-efficacy beliefs) find decision challenges threatening because their affect constantly interferes in the quality of their decision processes. The very concept of ‘emotional intelligence’, defined by Mayer et al. (2008, p. 511) as “…the ability to carry out accurate reasoning about emotions and the ability to use emotions and emotional knowledge to enhance thought”, refers to the individual’s ability to promote or inhibit affect infusion.

These findings demonstrate that information loaded with affect does not only exert a direct influence on the quality of decision processes. It also functions as directional input to motivated actions, via effortful attentional allocation, and it directs actions. Accordingly, decision-generated affect is counterproductive when individuals misallocate limited, conscious, attentional resources to decisional processes that reduce their negative affect. A social-cognitive interpretation of these findings suggests that individuals have a repertoire of decision-process strategies from which to choose and that they decide how to decide by considering a number of goals in response to decision demands.

Whether affect actually hinders or assists decision making is thus largely determined by how individuals experience and regulate their affect. Self-efficacy beliefs account for the adoption of a motivated, controlled decision process as mediated by the degree to which affect is regulated. Coping with negative affect is one salient goal in decision making (Luce, 2005) and decision makers adapt to negative affect by adopting easier-to-implement decisions or avoiding decisions.

**Summary**

The empirical findings reviewed point to the following:

- Individual’s subjective perceptions and appraisals of MDM demands depend in part on differences in self-efficacy beliefs.
• These differential appraisals provide an affective summary that reflect the match between self-efficacy beliefs and the subjective appraisal of the situational constraints.

• Decision-generated affect exerts a direct influence on the quality of decision processes since it functions as directional input to motivated actions by redirecting attentional resources from the decision processes to the affective experience.

• Self-efficacy beliefs account for the adoption of a motivated, controlled decision process as mediated by the degree to which decision makers adapt to negative affect by adopting easier-to-implement decisions or avoiding decisions.

• Self-efficacy beliefs mediate between experienced decision-generated affect by reallocating attentional resources and affect to on-task, effortful MDM processes.

The next subsection reviews empirical evidence which demonstrates that decisional avoidance responses are moderated by contextual factors and that they serve the purpose of avoiding or minimizing decision-generated affect.

**Allocation of Attentional Resources**

There are multiple reasons people may seek to avoid choice, not the least of which is a reluctance to be held responsible for negative outcomes stemming from one’s decision. Another reason, however, may be that the decision process itself is costly, insofar as it consumes valuable resources. These two decisional response patterns are described in the next subsections.

**Decisional Procrastination**

Experimental studies with undergraduate students have demonstrated that indecisive individuals take longer in decision making tasks (Ferrari & Dovidio, 1997, 2000; Ferrari & Pychyl, 2007; Frost & Shows, 1993). Individuals delay their decisions when they feel that they do not have enough information to make a decision, as demonstrated in studies of nurse managers by Jatulis and Newman (1991) and in a study of undergraduates by Rassin, Muris,
Franken, Smit and Wong (2007). Moreover, indecisive undergraduate individuals were shown to search for and focus more on information within the same choice alternatives. This impacted on decision making time for the choice they ultimately made (Ferrari & Dovidio, 2000), particularly when they had to choose between more alternatives. Ferrari and Dovidio also demonstrated that for indecisive individuals, the number of alternatives moderated decisional avoidance. In fact, the propensity to avoid choice tended to be stronger when there were five alternatives compared to two. The full regression equation accounted for 36% of the variance in decision times. This was consistent with findings by Tversky and Shafir (1992) that the difficulty of choosing among options created conflict that increased the tendency to defer the choice. In fact, indecisive individuals were shown to avoid the necessary information needed to make an accurate, fully informed choice when equally attractive alternatives were presented, because making a decision required more attentional effort (Ferrari & Pychyl, 2007). These findings are consistent with other evidence indicating that difficult trade-off decisions required an increase in the attentional effort required to select choices and therefore increased the propensity to avoid decisions (Luce, 1998).

Moreover, individuals high and low in decisional avoidance differed fundamentally in the types of decision strategies they used. Indecisive individuals were shown to use narrower and rigid strategies (Ferrari & Dovidio, 1997, 2000). In another study of college students, Ferrari and Dovidio (2001) report a significant propensity to avoid decisions under high attentional load and individuals with lower self-confidence and greater anxiety delayed decision making as an avoidance strategy. The tendency to avoid decisions however, was not related to a lack of cognitive ability. General cognitive ability (e.g., abstract thinking and verbal reasoning) and the propensity to avoid decisions were shown to be uncorrelated (Ferrari & Dovidio, 1997). In a meta-analytic review, Steele (2007) also reported the relationship between indecision and intelligence at an insignificant level, which supports the aforementioned findings.

Based on the findings above it is evident that the failure to regulate attentional resources (due to affective concerns) induces the propensity to avoid decisions. Previously it was shown that the existence of distractions (i.e., affective concerns) reduces accessibility to attentional resources (Sarason et al., 1996) and that subjectively experienced complexity is inherently effortful (Lucas et al., 2006; Mangos & Steele-Johnson, 2001; Maynard & Hakel, 1997).
Moreover, when individuals are aware that they have exerted increased effort they rate a task as more difficult than those tasks involving less effort (Fisher & Noble, 2004; Yeo & Neal, 2004, 2008). In support of this, the correlation between perceived task difficulty and effort intensity has been found to be significant (Smillie et al., 2006). Frost and Shows (1993), in an experimental decision-making task, also demonstrated that perceived unpleasant decisions motivated delays in decision making. This relationship between aversion to tasks and delaying tasks was confirmed as consistent and strong in Steel’s (2007) meta-analytic review on procrastination. Therefore, the more individuals dislike a task, the more they consider it effortful or anxiety provoking, and the more they procrastinate.

Luce et al. (2001) documented evidence that decision makers are concerned about minimizing negative affect in order to save attentional resources. In three experiments that involved different manipulations of task-related negative affect and decision processing, Luce et al.’s (1997) study of undergraduates showed that individuals experienced more negative affect when they faced conflicting choices and high trade-off difficulty. Furthermore, the interaction between conflict and trade-off difficulty was significant with increased affect also associated with higher threat. Personal volition affects the willingness or effort expended to enact appropriate decision making. Patalano and Wengrovitz (2007), in a study with undergraduate students, demonstrated that decisive individuals modulated their deliberation in response to the presence versus absence of risk, whereas indecisive individuals did not. Their results however illustrate that indecisive individuals do not uniformly increase delays in their decisions but that their delay behaviour may be more striking in its unresponsiveness to risk.

Threat avoidance is thus a core component of risk-avoidant decision-making as demonstrated in various studies (Finucane et al., 2000; Finucane et al., 2003; Haleblian et al., 2004; Simon et al., 1999; Slovic et al., 2002). Across these studies, negative affect (i.e., anxiety) had a pronounced impact on the tendency to engage in risk-avoidant decision making. For instance, anxiety, worry, and social anxiety were each associated with risk-avoidance in a risk-taking task in three studies involving undergraduate students by Maner et al. (2007).

Baumeister et al. (2007) argued that minimizing affect is a prime motivator in most behavioural choices and a great deal of inaction stems from minimizing aversive affect (see also Anderson, 2003, for a review). Individuals who doubt their ability to make good decisions use affect-focused coping to alter the affect they experience either by avoidance (Anderson,
2003, 2007), decisional procrastination (Ferrari, 2001; Ferrari & Dovidio, 1997, 2000, 2001; Ferrari & Pychyl, 2007; Orellana-Damacela, Tindale, & Suarez-Balcazar, 2000; Renn et al., 2005; van Eerde, 2000), by changing the meaning of the situation (e.g., evasion or escape) thereby letting others make the choice (e.g., developing spurious arguments that favour the least objections) (Lerner & Tetlock, 2003; Lucas et al., 2006; Mirels et al., 2002), or by showing an increased preference for the status quo option or any other option that is easier to justify to oneself or others (Geletkanycz & Black, 2001; Luce, 1998).

Earlier it was shown that individuals make strong external attributions to subjectively experienced task difficulty. Consequently, attentional effort may display a negative association with performance because high effort is taken as indicative of low ability (see also Bandura, 1991; Jourden, Bandura, & Banfield, 1991; Wood & Bandura, 1989b). Effert and Ferrari (1989) illustrated that indecisive individuals reported less confidence and avoided decisions in order to prevent disclosure of perceived inabilities and incompetence. Furthermore, Ferrari (1991d) demonstrated that indecisive individuals avoided self-relevant information in order to complete easy, less effortful tasks. Other consistent evidence suggests that a delay in making decisions is related to low self-esteem, to low self-confidence, as well as to concerns about anxiety and social comparisons of performance (Ferrari, 1991b, 1991c).

Janis and Mann (1977) demonstrated that hypervigilance (quick closure) refers to the desire for certainty and intolerance for ambiguity through the inclination to ‘seize’ and then ‘freeze’ on early judgment cues. Cheng (2003), in a study with first year students, illustrated that ambiguity and uncertainty induced individuals to act toward their own goals (e.g., to minimize affect to solve the problem) and motivated them to bring information processing to a close by leaping to a conclusion. This, subsequently, biased their choices toward closure-bound pursuits and induced positive affect when the goal was attained or not attained.

Given the hypothesis that self-efficacy beliefs play a role in motivating and initiating behaviour, Haycock, McCarthy, and Skay (1998) noted that it is surprising that few published studies have attempted to examine the association between self-efficacy beliefs and the propensity to avoid decisions. In one study by Jatulis and Newman (1991) it was demonstrated that self-efficacy beliefs accounted for a main effect on the readiness to make a decision. Managers’ level of self-efficacy beliefs thus mediated their need for additional information to evaluate decisions and for time to decide. The propensity to avoid decisions was also related to
self-efficacy beliefs and anxiety in a study by Haycock et al. (1998). Moreover, procrastination was inversely and significantly related to efficacy level, cumulative efficacy strength and average efficacy strength (Steel, 2007). Steel reported a negative relationship between self-efficacy beliefs and procrastination with conscientiousness (effort and persistence) inversely related to avoidance.

Payne et al. (2007) presented an empirical review of the presumed effects of antecedents, proximal and distal consequences of learning, prove performance, and avoidance, as goals in academic, task and job performance. Distal consequences in this study included learning, task and job performance and academic performance. Antecedent variables included cognitive ability, an implicit theory of intelligence, the need for achievement, self-esteem, general self-efficacy beliefs (domain-independent confidence), and the Big Five personality traits. Proximal consequences included task-specific self-efficacy beliefs, self-set goal level, learning strategies, feedback seeking, and state anxiety. General self-efficacy beliefs (confidence) acted as an antecedent to an avoidance goal orientation, and task-specific efficacy beliefs correlated negatively with avoidance. Avoidance, as a goal, also correlated negatively with feedback seeking, and individuals with strong avoidance tendencies tended to set low goals for themselves.

Taken as a whole, these findings suggest that affect has a motivational and volitional effect by interrupting or changing goal setting, planning, and action initiation. Consequently, individuals who are plagued by self-doubts (accompanied by lack of self-confidence, anxiety over skills, and insecurities about task abilities) fail to develop challenging intentions, and become stuck in fruitless contemplation processes that reflect a failure in the self-regulation of attentional effort and affect. The following subsection reviews empirical evidence demonstrating that acts of choice and self-control cause attentional resource allocation that leads to subsequent decrements in the quality of decision processes due to the mediating effects of decisional fatigue (see Table 2.1 in this regard).

Decisional Fatigue

Fatigue is different from typical negative affect. Fatigue is more likely than negative affect to operate as a signal to reduce engagement in active information processing as it reflects an over-commitment of attentional resources to decision making processes and favours passive-
evasion and avoidance options in decision making (Baumeister et al., 1998). Relatively few studies exist concerning the direct effects of fatigue on decision making. This discussion proceeds to outline empirical findings of the effects of fatigue on decision making, followed by the effects that exercising choice has on the depletion of attentional resources, thereby contributing to decisional fatigue. Fatigue is an inherently subjective aversion to expend effort (Hockey et al., 2000) and represents an end-state of extended self-regulation in which there is a shift towards a preference for activities that require less effort or limited use of high-level control actions (Hockey, 1997).

The effects of extended self-regulation lead to attentional resource depletion and increased subsequent passivity (Baumeister, 2001; Schmeichel & Baumeister, 2004). Consequently, decisional fatigue and exhaustion can alter the desirability of making decisions and decrease the desirability of further increments of effort. Vohs et al. (2008) undertook four laboratory studies with undergraduates in which one group of individuals had to make decisions whereas other groups only had to contemplate the same options without making decisions. Findings demonstrated that making decisions led to reduced self-control as indexed by less physical stamina, reduced persistence, higher propensity to avoid further decisions and poorer numerical processing. Furthermore, it was shown that making a decision depleted attentional resources more so than merely deliberating and forming preferences about options. Deliberating without choosing also depleted attentional resources but not as much as deliberating and deciding. Anticipated positive affect also reduced attentional resource depletion when making a single decision but this was not the case when making many decisions (see also Vohs et al., 2005).

Self-regulatory exertion was also shown to lead to decrements in a study with undergraduates by Muraven et al. (1998). In a series of experiments it was shown that individuals who tried to regulate affect (either by amplifying or suppressing it) performed worse on a subsequent task. Individuals who suppressed thoughts about an arbitrary stimulus were also more likely to give up quickly on a subsequent, frustrating task, compared to individuals in a control condition. Furthermore, Baumeister et al. (1998) demonstrated that individuals in a suppress-affect condition reported that they found regulating their affect more effortful when compared to a no-regulation condition.
There is also empirical support that such depletion leads to poorer cognitive performance on complex tasks (Schmeichel et al., 2003). Undergraduates were used in this latter study and were required to regulate their attention and affect whilst their performance on simple to complex cognitive tasks was measured. The results indicated that higher order cognitive processing was affected but that simple information processing was unaffected by the same manipulations in the studies.

Also interpersonal influence, although sometimes efficient and effortless, is at times effortful. Limited attentional resources are easily consumed in dyadic settings that can make individuals particularly susceptible to others’ influence attempts. This notion was examined by Janssen et al. (2008) in a series of field experiments in which adults were requested to participate in a short study. These authors demonstrated that the depletion of attentional resources explained social influence techniques aimed at inducing consumer compliance. Their results support the prediction that conservation of attentional resource fosters the use of heuristics and concomitant compliance with requests. Across five studies with undergraduates, Finkel et al. (2006) subjected individuals to either a high- or a low-maintenance interaction before engaging in an individual-level task requiring self-regulation (i.e., a challenging task with high reward potential involving an anagram performance, exam performance, physical stamina and fine motor control). The findings uniformly supported the hypothesis that experiencing high-maintenance interaction impaired self-regulatory success on subsequent, unrelated tasks. Accommodating choices made by others is also effortful and consumes attentional resources. In five studies with undergraduates who made a series of choices regarding consumer products, Vohs et al. (2008) demonstrated that making choices showed poorer task persistence and performance, as compared to individuals who viewed or rated similar options without making choices. Moreover, the latter findings point out that a lack of choice or accommodating choices made by others, consume attentional resources that contribute to fatigue. Consequently, contemplation of alternatives and selection among them is as effortful as a psychological act as accommodating oneself to external dictates.

Hockey et al. (2000) demonstrated a correlation between fatigue and making risky choices in a study with undergraduate students. Fatigue enhanced the adoption of low effort decision processing (i.e., heuristic decision processing) because self-regulation may be less effective with the onset of fatigue (Hockey, 1997; Muraven, Tice, & Baumeister, 1998). These
results confirmed the relatively strong effect of fatigue on making risky decisions. At low or moderate levels of fatigue, anxious individuals showed a preference for safe options, consistent with the view that anxiety enhances risk avoidance (Haleblian et al., 2004; Maner et al., 2007; Raghunathan & Pham, 1999; Raghunathan et al., 2006). Conversely, a high level of anxiety facilitates increased risk taking under conditions of fatigue.

Positive affect, however, buffers and counteracts the effects of attentional resource depletion. Tice et al. (2007,) in a study of undergraduate students, demonstrated that inducing positive affect counteracted the effects of attentional resource depletion across four studies that involved tasks requiring high levels of self-regulation of effort, persistence and affect. The finding that positive affect did not only counteract the depletion of resources of previous effort exertions but also enhanced the self-control on subsequent self-control tasks was noteworthy. This improvement was shown to be specific to positive affect and not a product of arousal, distraction, or other variables. In addition, positive affect resulted in significantly higher persistence.

Summary

The following can be concluded from the review of findings:

- Decision-generated affect exerts a direct influence on the quality of decision processes since it functions as directional input to motivated actions that induce a motivational and volitional propensity to avoid decisions.
- The failure to regulate attentional resources (due to affective concerns) induces the propensity to avoid decisions. Consequently, individuals who are plagued by self-doubts fail to develop challenging intentions that favour decision evasion and avoidance.
- The tendency to avoid decisions however, is not related to a lack of cognitive ability or social self-confidence.
- Individuals with resilient self-efficacy beliefs are however better at conserving effort (i.e., attentional resources), a strong feature of the subjective aversion to expend effort in fatigue.
• Fatigue operates as a signal to reduce engagement in active information processing as it reflects an over-commitment of attentional resources to decision making processes that alter the desirability of making decisions and decrease the desirability of further increments of effort.

• Self-efficacy beliefs are, however, not a direct mediator of decisional fatigue. Bandura (2004) asserted that individuals read and interpret their fatigue in order to judge their capabilities.

• Individuals with resilient self-efficacy beliefs are however better at conserving effort (i.e., attentional resources), a strong feature of the subjective aversion to expend effort in fatigue (Hockey, 1997; Hockey et al., 2000).

• Decisional fatigue is a more distal consequence of attentional resources allocation.

One question posed by the present reszesrch is whether decision-generated affect and the allocation of attentional resources as temporal processes, mediate the quality of MDM processes and outcomes?

**Integrative Summary**

The central thesis in this study argues that managers apply decision making processes to make choices in the service of both individual and organizational goals. Existing research confirms that decision making is a critical aspect of managers’ work and that the quality of their decision making impacts significantly on their organization’s performance. Furthermore, extant research confirms that high quality decision processes lead to more desirable outcomes than do poor quality decision processes. In spite of its significance, research on MDM remains limited and the present empirical knowledge on managers as decision makers is relatively scarce. A review of published research in leading international journals revealed limited research published on decision making over four and a half decades and the researcher found only a few articles related to South Africa.

Empirical findings are largely based on non-managerial samples in laboratory settings. Research conducted using students is questionable since findings may not generalize to managers in real life decision making. By its very context-specific nature, how decisions are actually made and how better decisions could be made in organizational settings does not lend
itself to simple analysis. It presents challenges that are not faced by experimental research. In
addition, absent from most studies in decision making is the failure to elucidate what
constellation of individual attributes are jointly necessary to influence decision making.
Moreover, relatively little is known about the motivational and volitional processes that
account for individual differences in managerial decision making. In spite of the popularity of
the motivational and volitional effect of self-beliefs in efficacy there has been surprisingly few
efforts to determine the unique or incremental validity of self-beliefs in efficacy in order to
justify its incremental contribution in MDM. As was evident in the empirical review, few
studies have examined the independent and joint individual-variable ability-factors (objective
cognitive ability), non-ability factors (self-report, personality and affect), and conative factors
(self-regulatory and motivational) in order to estimate their contributions to the prediction of
individual differences in the quality of MDM processes. This has contributed to slow progress
in the development of a useful, integrative understanding of MDM.

In the absence of a coherent and adequate theoretical framework, the researcher adopted
social-cognitive theory as a plausible framework towards understanding both MDM processes
and affect as a function of the individual variables of the manager as the decision maker, as
well as the behavioural expressions of choice, given an imposed operative environment in
organizations. After reviewing the large corpus of empirical findings from research concerning
performance and decision making, in diverse settings, with various measures, scattered across
laboratory and field settings, and using students, employees and managers, the researcher was
able to extract confirmatory empirical research relevant to the present study. These empirical
generalizations afforded the researcher an opportunity to select and extract empirical links in
order to support the plausible constellations or potential associations of individual variable
factors, together with their time-ordered influences, and the cumulative effects they bring to
bear on the prediction of decision-generated affect, volitional allocation of attentional resources
and subsequent quality of decision processes and outcomes (as illustrated in Figure 2.3 on page
66).

Chapter Four outlines the broad problem statement, which provides a point of departure
for the present investigation. On the basis of the problem statement, research questions for the
present study are also presente
CHAPTER FOUR

PROBLEM STATEMENT AND RESEARCH QUESTIONS

The primary motives for research in the behavioural sciences are to develop scientific theories and to solve problems that occur in everyday life. Accordingly, a major goal for any research is the development of theory, or explanations, for the phenomena studied. Theories, in turn, are of necessity built on a foundation of facts that consist of relationships that need to be established and which the proposed theory must incorporate and explain (Schmidt et al., 2008). In Chapter Two it was noted that conceptual research has outpaced confirmatory empirical research in MDM and, despite a strong conceptual foundation, there is insufficient empirical evidence to confirm how managers make decisions in organizations. In fact, various authors have called for more research on the degree to which individual variables and proximal self-regulatory skills in concert apply to decision making processes that result in decisions in the service of both individual and organizational goals.

By framing the research at the individual level decision making is conceptualized as the intentional and explicit commitment to devote attentional resources to a course of action in order to satisfy multiple goals in response to the subjective appraisals of the environment. Despite its theoretical and practical importance, the absence of a coherent and adequate theoretical framework to organize, simplify and explain how managers make decisions as agents for organizations has limited progress and an understanding of MDM. It was argued that MDM is an integrated and interactive psychological process that is regulated extensively by the organizational environment (i.e., task and context demands) and individual variable factors as multiple and reciprocal determining factors of the intentions and direction of managerial decision behaviour. Chapter Two provided a conceptual framework of the theoretically relevant constructs and conceptual relations in MDM based on social cognitive theory. Social cognitive theory (with self-efficacy beliefs as a central integrating variable) was argued to be descriptively adequate in order to organise and simplify the theoretically relevant managerial decision making constructs in a coherent and parsimonious manner. Further, a social cognitive approach regards MDM as conditional on the independent and interactive influence of self-efficacy beliefs in the application of individual capabilities in order to reflect how effort and
ability will combine and the type of affect a manager will experience in response to decision demands.

The empirical review and generalizations in Chapter Three provided for a reasoned assertion that suggests the constellations or potential associations of variables (i.e., jointly incorporating individual ability and temporal motivational process variables) in a causal time-ordered structure that account for individual differences in the quality of MDM processes and outcomes. These conceptual and empirical underpinnings culminated in a conceptual model of relations represented by the series of specific causal paths linking individual variable factors (distal influences) and self-efficacy beliefs (proximal influences) that bear on the construct of MDM.

MDM is embedded, however, in a rich nomological network that contains numerous antecedent and/or consequential variables that are likely to be transmitted through additional links in a causal chain. Further, Bandura (2008) argues that such multiple influences do not imply symmetry in strength nor are these influences fixed. There is thus no question that decision making is complex and not easy to translate into mathematical or otherwise simplified models (Weber & Johnson, 2009).

In addition, MDM does not lend itself to simple linear, antecedent-consequence analysis in actual organisational situations (Bandura, 1997; Critchfield & Kollins, 2001; Fischhoff, 2008; Hodgkinson & Healey, 2008; Hough & White, 2003). Therefore, any understanding of how managers actually make real decisions in business contexts faces challenges not faced by experimental research (see, in this regard, Leaptrott & McDonald, 2008). Critchfield and Kollins (2001, p. 101) elaborate on this point:

behaviors of interest may not lend themselves readily to direct observation or experimental manipulation, and that these behaviors, as well as the environmental events that affect them, occur over such extended time frames that discrete relations between responses and consequences become difficult to discern.

Further, Bandura and Locke (2003) state that there is no experimental analogue nor a single investigatory approach to investigating the multiplicity and time-ordered effects of antecedents and consequences in complex behaviour. In order to overcome the multiplicity of
potential influences in a naturalistic setting, the present research makes use of a simulated decision environment to examine and observe the temporal dynamics in MDM so as to elucidate the relations under investigation. It is argued that such a setting provides for a degree of controlled enquiry in order to make it possible to reproduce the behaviours of the real world of MDM by controlling many potentially confounding variables while maintaining business decision making relevance.

A testable assumption underlying the present study is that decisions are related to the quality of decision processes in MDM. By framing the study at the individual decision process level, the present researcher focuses on the independent and combined contributions of individual variable factors and self-efficacy beliefs in the prediction of decision-generated affect. Moreover, the volitional-undermining effect of decision-generated affect acts as a mediating influence on the quality of MDM processes and outcomes. This ordering of the variables is chosen *a priori* and presented as a causal chain of influences in order to underscore the dynamic nature of MDM (as was illustrated in Figure 2.3).

**Primary Aim**

The researcher proposes a structural model of relations (as illustrated in Figure 2.3) in which distal individual variable factors and self-efficacy beliefs combine to mediate the availability of attentional resources (as indexed by decision-generated affect and avoidance) that predict the quality of MDM processes and outcomes. The single and primary aim of the study is to establish the postulated ordering of a causal path linking individual variable factors (distal influences), self-efficacy beliefs (as proximal influences) and temporal processes as a whole, as a plausible model to account for individual differences in the quality of MDM processes and outcomes. The demonstration of causality in the present research does not lie in the analytical methods chosen but refers to the theoretical justification provided to support the analyses (Tabachnick & Fidell, 2001; Ullman, 1998).

**Research Question**

The theoretical argument proposed depicts distal individual factors (cognitive ability and social self-confidence) and the proximal influence of self-regulation of effort and affect
(via self-efficacy beliefs) as causal sources of influence in the prediction of the quality of MDM processes and outcomes. In accordance with the proposed model of relations in MDM, the research problem is subsequently posed as “What are the direct and indirect (mediated) effects of the independent and combined contributions of individual variable factors and self-efficacy beliefs as predictors of the quality of MDM processes and outcomes?”

Specific Aims

On the basis of the problem statement, it is possible to develop specific aims to guide the study. These specific aims are presented below:

- The first aim is to evaluate to what extent the proposed model offers an empirical fit that specifies how individual variable factors in conjunction with self-efficacy beliefs govern decision-generated affect and the propensity to avoid decisions in the prediction of the quality of MDM processes and outcomes.
- The second aim is to determine whether cognitive ability, self-efficacy beliefs and social self-confidence independently account for the prediction of decision-generated affect in MDM.
- The third aim is to determine whether decision-generated affect influences the allocation of attentional resources in MDM.
- The fourth aim is to determine whether the allocation of attentional resources accounts for the prediction of the quality of MDM processes and outcomes.

The research hypotheses and statistical hypotheses are presented in Chapter Six when the statistical analysis methods employed are outlined. Considerations for inclusion of variables in a multivariate analysis include availability, reliability and theoretical relationships among variables. The depicted constructs in Figure 2.3 on page 66 were deliberately created to represent a collection of concrete forms of behaviour which qualify as indicators of unobserved variables (i.e., the underlying construct). Any assessment of the substantive relations of interest (i.e., the associations among the variables themselves) requires an investigation of the psychometric integrity of the measures that are used to operationalise the variables comprising the proposed model. In keeping with the literature and empirical research, Chapter Five is dedicated to the operationalization and
psychometric evaluation of measures pertaining to the study. The conceptualization and operationalization of each of the variables as illustrated in Figure 2.3 are presented. As part of the study it was necessary to construct and validate custom indicator measures in an independent pilot study from the same population. The evolving nature of sample data collection provided an opportunity for non-probability, purposive sampling. The pilot study determined the factor structures of the dimensionality and internal consistency of the measures in order to aid in the development and validation of the custom-designed measures. The external construct validity by way of both convergent, as well as, discriminative validity of the custom-designed scales are also presented. Finally, univariate normality of the measures are outlined and presented.
CHAPTER FIVE
OPERATIONALIZATION OF CONSTRUCTS

The conceptual and empirical evidence of earlier chapters afforded the researcher an opportunity to formulate plausible specific paths linking individual variable factors (distal influences), self-efficacy beliefs (proximal influences) and temporal processes that have a bearing on the construct of MDM. All the variables in the path diagram (as illustrated in Figure 2.3) can be placed into one of two classes, that is exogenous and endogenous variables. Exogenous variables, sometimes referred to as source variables or independent variables, are those that are the starting point for the proposed model because they are assumed not to be the effects of other variables in the model except for (potentially) other exogenous variables. Byrne (2001) describes exogenous variables as being synonymous with independent variables, that is they ‘cause’ fluctuations in the values of other variables in the model. In contrast, endogenous variables are synonymous with dependent variables and, as such, are influenced by the exogenous variables in the model, either directly or indirectly.

The exogenous and endogenous variables that are relevant to the present study are specified in Table 5.1.

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<thead>
<tr>
<th>Exogenous variables</th>
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<td>Cognitive ability</td>
<td>Self-efficacy beliefs</td>
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<td>Social self-confidence</td>
<td>Decision-generated affect</td>
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<td>Allocation of attentional resources</td>
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<td>MDM processes and outcomes</td>
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</tbody>
</table>

The researcher operationally defined the exogenous and endogenous variables in terms of theoretically measured behaviour in order to serve as operational indicators that represent an empirical grasp of the variables. The depicted constructs are deliberately created to represent a collection of concrete forms of behaviour which qualify as indicators of the construct. This assessment of the behaviour constitutes the direct measurement of the relevant variable, albeit the indirect measurement of an unobserved variable in question (i.e., the underlying construct). Since the use of any measuring instrument implies a degree of trust in its psychometric properties it is important to evaluate the extent to which these measured indicators succeed in
providing a comprehensive empirical understanding of the constructs under consideration. Clearly, unless the quality of the measures can be trusted, any assessment of the substantive relations of interest (i.e., the associations among the variables themselves) will be problematic. Table 5.2 lists the variables and their respective measured indicators and measurement scales.

Table 5.2 Variables, Indicators and Measures

<table>
<thead>
<tr>
<th>Exogenous variables</th>
<th>Indicators</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive ability</td>
<td>Verbal ability</td>
<td>Critical Verbal and Numerical Reasoning Test (CRTB2)</td>
</tr>
<tr>
<td></td>
<td>Numerical ability</td>
<td></td>
</tr>
<tr>
<td>Social self-confidence</td>
<td>Assertion</td>
<td>15 Personality Factor E (15FQ+)</td>
</tr>
<tr>
<td></td>
<td>Social boldness</td>
<td>15 Personality Factor H (15FQ+)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Endogenous variables</th>
<th>Indicators</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-beliefs in efficacy</td>
<td>Social influence efficacy *</td>
<td>Decision Making Self-Efficacy Questionnaire (DMSEQ)</td>
</tr>
<tr>
<td></td>
<td>Exploratory search and processing efficacy *</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thought and affect control efficacy *</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Risk tolerance efficacy *</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Analytical and inferential efficacy *</td>
<td></td>
</tr>
<tr>
<td>Decision-generated affect</td>
<td>Immediate affect *</td>
<td>Custom-designed self-descriptive scale</td>
</tr>
<tr>
<td></td>
<td>Anticipated affect *</td>
<td></td>
</tr>
<tr>
<td>Allocation of attentional resources</td>
<td>Fatigue</td>
<td>Profile of Mood States (Fatigue subscale)</td>
</tr>
<tr>
<td></td>
<td>Decisional procrastination</td>
<td>The Decisional Procrastination (DP) Scale</td>
</tr>
<tr>
<td>Quality of MDM processes (and outcomes)</td>
<td>Procedural rationality</td>
<td>Critical Business Planning (CBP)</td>
</tr>
<tr>
<td></td>
<td>Decision quality *</td>
<td>Role play simulation observation scale</td>
</tr>
<tr>
<td></td>
<td>Rational social influence *</td>
<td>Role play simulation observation scale</td>
</tr>
<tr>
<td></td>
<td>Bargaining *</td>
<td>Role play simulation observation scale</td>
</tr>
<tr>
<td></td>
<td>Independence *</td>
<td>Role play simulation observation scale</td>
</tr>
</tbody>
</table>

*Custom designed

The following subsections describe the conceptualization, operationalization and psychometric evaluation of each of the measures as listed in Table 5.2. Some of the measures of the endogenous variables were custom designed and this has been indicated in the Table by an asterisk. Preliminary studies were conducted in order to evaluate the psychometric properties of the indicators used as measures. The exploratory factor (EFA) and internal reliability (Cronbach α) analyses computed for custom-designed measures however ran a risk
in that the solutions might be optimal for the specific samples on which they were obtained but not for the sample used in the study and they might not be generalizable for the population. The sample used to gather psychometric information on the measures is also limited to experienced managers in South Africa in industry-specific companies in the Western Cape. As such, findings may not necessarily be generalizable to other geographical areas, economic sectors or cultural groupings.

In the case of the available standardized measures (i.e., verbal and numerical ability, assertion, social boldness and procedural rationality), the researcher reports on both their psychometric properties as well as statistically significant differences between ethnic groups. The discussion that follows describes each of the variables and the evaluation of their indicators. The operationalization of the exogenous variables and their indicators are discussed first, followed by a description of the operationalization of the endogenous variables.

Exogenous Variables

Cognitive Ability

Cognitive ability is a significant determinant of individual differences in performing tasks that involve the active manipulation of information. Both verbal and numerical ability are required for decision tasks such as analyzing/interpreting and understanding relevant information, creating/conceptualizing and integrating information, and reasoning about the information (Parker & Fischhoff, 2005; Peters & Levin, 2008; Peters et al., 2006; Schmidt & Hunter, 2004; Schmidt et al., 2008; Stanovich & West, 1998a, 1998b; Yeo & Neal, 2008).

Operationalization

The measurement of individual managers’ ability to think in a rational, critical way and to make logical inferences is measured with a standardized psychometric measure, the Critical Verbal and Numerical Reasoning Test Battery (CRTB2; Psychometrics Limited, 2002a). The verbal reasoning measure assesses the ability to understand semi-technical reports requiring quick, accurate and reliable interpretation of written reports, and to draw logical conclusions and inferences from such written information. The numerical reasoning measure assesses the
ability to understand and critically evaluate a wide range of numerical information presented in tabular form, and to use this information accurately and in a logical way.

The publisher compared the CRTB2 measure to The Watson-Glaser Critical Thinking Appraisal (W-GCTA) and reported a convergent validity of \( r = .57 \) in their manual (CRTB2; Psychometrics Limited, 2002a). The W-GCTA (Watson & Glaser, 1980) has set the standard in the assessment of abilities that are relevant in MDM and the use of the CRTB2 can be regarded as an acceptable alternative. The test publisher also reports that the CRTB2 verbal and numerical reasoning has a predictive validity of .47 and .43 respectively with business decision-making in MBA graduate performance. Both measures, critical verbal and critical numerical reasoning, have been standardized for South African conditions and display respectable K-R 21 reliabilities of .84 and .80 respectively. The test publisher also reports a Cronbach \( \alpha \) of .88 for critical verbal and .84 for critical numerical reasoning in a multi-cultural sample with a minimum grade 12 level education. The mean \( \alpha \) was .86. In addition, the publisher reports a relationship between the two measures (\( r = .52, p = .01 \)). The researcher could confirm this relationship (\( N = 264, r = .59, p = .001 \)) in the present study suggesting that, while the two constructs are related, they share only 35% of common variance.

The researcher has investigated the results of the CRTB on a separate sample of 154, of which 39% were black managers. The mean verbal score for black managers was 19.37 (\( SD = 7.2 \)); the mean score for the remaining sample was 20.7 (\( SD = 7.3 \)). A one-way ANOVA revealed no significant difference between black and other managers [\( F(1,152) = 1.229, p < .269 \)]. The mean numerical score for black managers was 12.0 (\( SD = 4.8 \)), the mean score for the remaining managers was 12.6 (\( SD = 4.4 \)). A one-way ANOVA revealed no significant difference between black and other managers [\( F(1,153) = .516, p < .474 \)] in this sample. The actual difference in mean scores between managerial groups was small. The effect size, calculated using eta squared, was .008 and .003 for verbal and numerical abilities, respectively. An eta square value of .02 is considered a small effect size (Cohen, 1988). This was encouraging given previous research that shows that cognitive ability measures are not always equivalent across diverse language groups and there are indications that some bias may exist for English second language test-takers, especially if they are black (e.g., Foxcroft & Aston, 2006).
These psychometric properties were encouraging given the fact that cognitive ability tests have been shown to result in the largest demonstrated mean differences between African-Americans and whites. A difference between means of 1 standard deviation has been reported in a number of studies where white individuals have been shown to score significantly higher mean cognitive ability test scores than black individuals (e.g., Gottfredson, 2002; Hunter & Hunter, 1984; Roth, BeVier, Bobko, Switzer, & Tyler, 2001).

Social Self-Confidence

It was pointed out earlier that social self-confidence is a broad construct that includes the basic capacity to interact socially at work. The present researcher used social self-confidence as a socio-political expression of personality in a socially adaptive fashion (Mayer, 2005) in order to reflect the level of surgency (the degree of impact and forcefulness) and the availability of attentional resources (energy) that is manifested in resourcefulness, decisiveness, dominance, independence, social presence and energy to act decisively and influence others. Further, social self-confidence reflects a domain-independent and stable individual disposition to meet challenging task demands and thus reflects generalized self-efficacy beliefs.

Operationalization

Ferris et al. (2002) have observed that a critical direction for future research is to investigate and establish the construct validity and precise delineation of the construct domain space of social effectiveness as a construct. Schneider, Kanfer, and Ackerman (1996) developed a measure that included seven factors (i.e., Extraversion, Warmth, Social Influence, Social Insight, Social Openness, Social Appropriateness, and Social Maladjustment). Schneider, Roberts, and Heggestad (2002) explored the structure of social competence, using the above self-report social competence inventory and confirmed five factors (i.e., social mastery, social maturity, social responsiveness, social control and social intelligence). Hogan and Hogan (2002) suggested that individuals who are socially astute, insightful, inspire trust and liking from others are sociopolitically intelligent which they argued was the foundation of social skill.
Given the absence of an existing social self-confidence measure the present researcher used Hogan and Shelton’s (1998) conceptualization of sociability/affiliation (i.e., high scorers are gregarious, outgoing, approachable, participative, talkative, and ambitious/potency (i.e., energetic, forceful, and competitive) as central traits of social self-confidence. To operationalize social self-confidence the researcher chose the 15FQ+ (Psychometrics Limited, 2002b), a self-report personality inventory that provides for a comprehensive assessment of personality traits and which has been standardized for South African conditions. The measure displays respectable psychometric properties with a mean Cronbach α of .75. The following factors were used in the present research:

Factor E+: Assertion. A low score taps the trait of accommodating, submissive, deferential (i.e., polite), and avoiding confrontation. A high score (dominant) is associated with an independent-minded, direct and determined interpersonal style. Factor E is also associated with a lack of social confidence. The Cronbach α is .75 (n = 226) for South African managers.

Factor H+: Social Boldness. This taps the traits of social boldness, venturesome, talkative, and socially confident. A high score is associated with a tendency to participate in social and group activities in a lively, enthusiastic manner. High scorers also feel self-assured and confident in social settings and actively seek out roles that place them ‘in the limelight’. The Cronbach α is .82 (n = 226 for South African managers).

The 15FQ+ has been used on a variety of samples (Tyler 2003) and demonstrates construct equivalence across all language groups in South Africa (Meiring, Van de Vijver, Rothmann & Barrick, 2005). Moreover, studies show reasonable to strong reliability coefficient values of 0.60 to 0.85 for the 15FQ+ scales (Tredoux, 2004; Tyler, 2003). Meiring, Van de Vijver and Rothmann (2006) report reliability findings for the 15FQ+ with a mean of 0.75 for South African professional and management development candidates. Moyo (2009) used a sample of 241 black managers assessed between 2002 and 2006 in order to study the item- and dimensionality analyses of the 15FQ+ subscales to determine whether these subscales represent the underlying personality constructs. The outcome of both the item and dimensionality analyses demonstrated that, although the items in each of the subscales seemed
to be representing the underlying personality construct, they were not without problems. Factor E and H showed little support for the assumption that all items comprising the constructs reflect one indivisible underlying construct. Moyo’s study illustrated that Factor H meets the benchmark reliability standard of .76, whereas the reliability coefficient for Factor E was .60. The cutoff value of .70 for evaluating the internal reliability of measures used in an applied setting should be kept in mind (Nunnally, 1978), especially as the reliability of personality measures are generally lower than those typically found in cognitive ability measures (Smit, 1996).

The present researcher investigated a separate sample of 607 managers of which 198 (33%) were black managers. The assertion factor (Factor E) for black managers revealed a mean of 17.1 and a standard deviation of 4.5 and the remaining managers displayed a mean of 16.8, with a standard deviation of 4.2. A one-way ANOVA revealed no significant difference between black and other managers \(F(1,605) = .444, \ p < .505\]. The social boldness factor (Factor H) revealed a mean of 15.8 for black managers and a standard deviation of 6.0 and for other managers a mean of 13.6, with a standard deviation of 6.2. A one-way ANOVA revealed a significant difference between black and other managers \(F(1,605) = 17.761, \ p < .000\]. The actual difference in mean scores between the groups was, however, quite small. The effect size, calculated using eta squared, was .007 and .03 for Factor E: assertion and Factor H: social boldness, respectively, both of which can be considered as small effect sizes (Cohen, 1988).

The next subsection presents the design, development and operationalization of the endogenous variables and their indicators.

**Endogenous Variables**

The design, construction and evaluation of indicator measures for self-efficacy beliefs, decision-generated affect, the allocation of attentional resources and the quality of MDM processes and outcomes are discussed below.

*Self-Efficacy Beliefs*

It was important to differentiate between problem solving and decision making for the purposes of this research. The former involves an overall estimate of one’s ability to assess a
present and desired state of affairs and of finding ways to move from the former to the latter state (Heppner & Lee, 2002; Heppner, Pretorius, Wei, Lee, & Wang, 2002; Heppner & Wang, 2003; Maydeu-Olivares & D’Zurilla, 1997). These beliefs are not tied to specific situations or behaviour but generalize to a variety of situations (Heppner, Witty, & Dixon, 2004). Decision making, conversely, is a sequence of interrelated decision processes in the service of choices of action to meet multiple goals. One distinction between decision making (i.e., making choices) and problem solving is that problems of choice are generally ill-defined (Hambrick et al., 2005b), are affected by a host of contextual factors (Beach & Connolly, 2005; Elbanna, 2006; Hough & White, 2003; Krantz & Kunreuther, 2007; Lerner & Tetlock, 2003; Padadakis, 2006; Sutcliffe & McNamara, 2001). They also give rise to affective self-reactions in relation to conflict between highly valued goals that consume finite attentional resources (Beal et al., 2005; Luce, 2005; Luce et al., 2001; Payne & Bettman, 2007). Self-efficacy beliefs in decision making, accordingly, refer to domain-specific beliefs of an individual’s appraisal of capability to use decision processes in order to make decisions so as to accomplish multiple goals.

From this line of reasoning decisional self-efficacy beliefs are conceptualized as a specific and situational view of perceived decision making competence at specific levels of performance in order to: mobilize motivation (effort and perseverance), exert rational and attentional resources (analytic and problem solving skills), exercise independence in social influence (to gain compliance, enlist cooperation and acquire resources), control disruptive and aversive cognitions, and implement courses of action in order to make accurate decisions. No such measure currently exists in the literature. The present researcher considered related measures of self-efficacy beliefs in decision making. The Career Decision-Making Self-Efficacy Scale (Taylor & Betz, 1983) was considered but in spite of the respectable internal reliability the measure is more appropriate as a measure of career decision-making self-efficacy beliefs. In addition, Watson, Brand, Stead and Ellis (2001) demonstrated that the subscales are questionable for the South African context. The South African Entrepreneurial Self-Efficacy Scale developed by Urban (2006) was also reviewed as a possible measure but it contained subscales that are not totally relevant to MDM. Although these measures reflect a reasonable commonality with decision making they aim to measure different kinds of decisions in contexts that are very different to those faced by managers as agents of decision making in
organizations. Consequently, decisional self-efficacy beliefs was operationalized in a questionnaire, the Decision Making Self-Efficacy Questionnaire (DMSEQ).

**Operationalization**

The validity of a test is closely linked to the validity of the theory (Foxcroft, 2004). The construction of the items for decisional self-efficacy beliefs relied on an informative conceptual analysis of the factors governing MDM. The present researcher avoided broad decontextualized self-efficacy belief items that focus on responses that individuals make to broad environmental demands since the interest of the present study was focused on managers’ context- and decision-specific performance.

MDM was conceptualized as: (1) an initiating activity (appraising the challenge, framing or structuring the problem, selecting situations requiring decisions); (2) a design phase (searching for potential solutions, surveying alternatives, seeking and weighing alternatives); and (3) making a choice (deliberating about and accepting one alternative from the available alternatives, influencing others, adhering to the decision despite negative feedback and opposition). Relying on this informative conceptual analysis of the aspects governing MDM, enabled the present researcher to define decision making self-efficacy beliefs as specific competence beliefs in which cognitive, social, emotional and behavioural sub-skills have to be organised effectively into proficient decision making actions. As such, these self-efficacy beliefs act as an active contributor to the allocation of effort to the identification and use of information, social persuasion and readiness to make decisions.

The DMSEQ was designed using the suggested guidelines for response format and construction of self-efficacy beliefs scales (Bandura, 1997, 2005; Moritz et al., 2000; Pajares, 2002). The standard methodology for measuring self-efficacy beliefs was employed where individuals were presented with items that portrayed different levels of decisional task demands and they were required to rate the strength of their belief in their ability to execute the requisite decision making activities regularly. Individuals recorded the strength of their self-efficacy beliefs on a 100-point scale, ranging in 10-unit intervals from 0 (‘cannot do’) through intermediate degrees of assurance, 50 (‘moderately certain can do’), to complete assurance, 100 (‘certain can do’). Sufficient graduations of difficulty were built into the self-efficacy belief items to avoid ceiling effects. The non-reactivity of self-efficacy belief assessments is not a
great concern and this is corroborated by Bandura (1997). Findings have demonstrated that individuals’ levels of motivation, affective reactions, and performance attainments are the same regardless of whether they do or do not make prior efficacy judgments. Nor are efficacy judgments influenced by a responding bias to appear socially desirable, regardless of the domain of activity.

With regards to administration, the standard procedure for measuring self-efficacy beliefs was employed. The administration used a number of safeguards to minimize any potential motivational effects of the self-assessment. These safeguards were built into the instructions and the mode of administration. A nondescriptive title ‘Business Problem Solving and Decision Making Appraisal’ rather than ‘Self-efficacy beliefs’ was used. To encourage frank answers, the importance of participants’ contribution to the research was explained clearly.

**Sample**

The questionnaire was administered to 146 managers as part of an extensive assessment process. Participants had at least five years experience in management and were employed in middle to senior management positions across a number of organizations in the private sector. The mean age was 38.5 years ($SD = 7.8$), of the sample 79% had a graduate or postgraduate qualification. Both genders were represented (males accounted for 67% of the sample) and the majority of the sample were white.

**Item Reduction**

Exploratory factor analysis (EFA) was used to verify the homogeneity of the original 30-item scale. The EFA was performed using the principal axis method and oblique, direct oblimin factor rotation to determine the factor structures of the dimensionality of the custom designed indicator measures (using SPSS for Windows Version 17.0). Oblique factor rotation is generally more desirable than orthogonal rotation at an early stage of scale development because of the fewer constraints it imposes (see, for instance, Hair, Anderson, Tatham, & Black, 1998) and is thus most appropriate when the *a priori* theory indicates that the obtained factors or dimensions are likely to be correlated. The items with the highest loadings on each measure were selected as construct indicators in order to assist in identifying understandable and interpretable factor structures associated with each of the endogenous variables under
Kaiser’s criterion of eigen-values over one and an item-factor structure coefficient of .60 or above were used as the ‘cutoff points’ for extracting and identifying factors. A Cronbach alpha of .70 was used as the generally agreed lower limit in order to evaluate the internal consistency of scales (Hair, Anderson, Tatham, & Black, 1998; Tredoux & Durrheim, 2002; Pallant, 2001).

The items tapping the same domain of self-efficacy beliefs grouped into five factors that suggested the multi-dimensionality of the DMSEQ. The items, together with their loadings on their primary factors, are reported in Table 5.3.
Table 5. 3 DMSEQ: Standard regression coefficients obtained via EFA (Oblimin Rotation with Kaiser Normalization)

<table>
<thead>
<tr>
<th>DMSEQ Items</th>
<th>Factor1</th>
<th>Factor2</th>
<th>Factor3</th>
<th>Factor4</th>
<th>Factor5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feel that I am making the right decisions</td>
<td>.820</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influence decisions with certainty that they will work</td>
<td>.793</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remain confident to make sound judgments and the right choices</td>
<td>.769</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Convince others of my decision choice even when opposition mounts</td>
<td>.741</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust my own judgment and express my opinions firmly</td>
<td>.740</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Persevere in my persuasive attempts to convince others of my decision choice</td>
<td>.719</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Know what to do next in decision making</td>
<td>.712</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Make difficult decisions under time pressure</td>
<td>.681</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Make decisions and persevere with actions to make them pay off</td>
<td>.652</td>
<td>.645</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influence decisions regardless of the amount of control I have over organizational constraints</td>
<td>.647</td>
<td>.605</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Search for new information and alternatives</td>
<td>.669</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Narrow down a list of alternatives that appear as effective options</td>
<td>.792</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discover a range of alternative/several solutions</td>
<td>.777</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obtain information by seeing what needs to be known</td>
<td>.762</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weigh negative and positive consequences of each alternative option</td>
<td>.754</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secure resources to implement my decisions</td>
<td>.650</td>
<td>.746</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appraise a business decision problem situation quickly</td>
<td>.734</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Choose the best alternative given the situation</td>
<td>.663</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limit negative thoughts entering my mind</td>
<td>.801</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contain my self-doubts about my ability to deal with adverse consequences</td>
<td>.766</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrain from worry about my decision choices and consequences</td>
<td>.727</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Readily commit to my decisions</td>
<td>.602</td>
<td>.644</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Think clearly and keep all the relevant factors in mind</td>
<td>.643</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrain from putting off difficult decisions</td>
<td>.853</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Make decisions that contain risks and potentially unfavourable consequences</td>
<td>.802</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analyze and interpret numerical/quantitative data accurately</td>
<td>.905</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manipulate quantitative data to identify trends, problems and their causes</td>
<td>.756</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use a methodical thinking process in my decisions</td>
<td>.702</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrain from changing my mind to the least objectionable alternative*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Percentage of variance</strong></td>
<td>46.4</td>
<td>6.5</td>
<td>5.0</td>
<td>3.5</td>
<td>3.5</td>
</tr>
</tbody>
</table>
Inspection of the correlation matrix revealed many coefficients above .3. The Kaiser-Meyer-Olkin value was .93, which exceeds the recommended value of .60 (Hair, Black, Babin, Anderson, & Tatham, 2006; Tabachnick & Fidell, 2001) and the Barlett’s Test of Sphericity reached statistical significance, supporting the factorability of the correlation matrix. EFA analyses of the DMSEQ scale yielded five factors with eigen values greater than 1. Four items loaded on more than one factor and it was decided to retain these items under the factor with the larger loading. Two items (marked by an *) were rejected and 28 of the original 30 items were retained. Following this, the first factor accounted for 47.1% (46.4% in the original scale) of the variance and was labeled Social Influence Efficacy in decision making. This factor confirmed Bandura’s (1997, 1999, 2008) argument that effective decision making in organizations requires high levels of managerial efficacy in social persuasion. This factor included 9 items.

The second factor accounted for 6.9% of variance (6.5% in the original scale). It was labeled Exploratory Search and Processing Efficacy (see, for example, Wood, Atkins, & Tabernero, 2000) and contained 8 items. Factor 3 included 5 items and was labeled Thought and Affect Control Efficacy (Bandura, 1997, 1999; 2004). It accounted for 5.1% of the variance (5% in the original scale).

Factor 4 (Risk Tolerance Efficacy) contained 2 items and accounted for 3.8% (3.5% in the original scale) of the variance. Various authors have confirmed that perceived decisional efficacy affects risk taking through its impact on perceptions of opportunities and threats (see, for example, Bandura, 1997; Barbosa, Gerhardt, & Kickul, 2007; Goodie & Young, 2007; Le Roux et al., 2006; Simon et al., 1999; Vecchio, 2002). Factor 5 was labelled as Analytical and Inferential Efficacy (4 items) and it accounted for 3.7% of the variance (3.5% in the original scale). This supported the argument that MDM requires a strong sense of efficacy in effortful analytical thinking (Bandura & Jourden, 1991; Bandura & Wood, 1989; Cervone & Wood, 1995; Wood et al., 2000; Wood et al., 1990).

Internal Reliability

The alpha coefficients for each subscale were computed as illustrated in Table 5.4.
Table 5.4 DMSEQ: Internal Consistency Coefficients: Full-Scale and Sub-Scales

<table>
<thead>
<tr>
<th>Factors: Subscale</th>
<th>Items</th>
<th>Cronbach α</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Social influence efficacy</td>
<td>10</td>
<td>.92</td>
</tr>
<tr>
<td>2. Exploratory search and processing efficacy</td>
<td>8</td>
<td>.91</td>
</tr>
<tr>
<td>3. Thought and affect control efficacy</td>
<td>5</td>
<td>.82</td>
</tr>
<tr>
<td>4. Risk tolerance efficacy</td>
<td>2</td>
<td>.60</td>
</tr>
<tr>
<td>5. Analytical and inferential efficacy</td>
<td>3</td>
<td>.80</td>
</tr>
<tr>
<td>6. Full Scale</td>
<td>28</td>
<td>.95</td>
</tr>
</tbody>
</table>

Nunnally (1978, p. 246), however, cautions against the use of Cronbach alpha in scales across different domains:

the result would be quite erroneous unless the x variables were all measures of the same trait, e.g., alternative forms of a test of spelling ability. The reliability of samples of items from the same (author’s emphasis) domain depends entirely on the average correlation among the samples, but this does not hold for samples of items from different (author’s emphasis) domains.

Using Nunnally’s suggestion, the reliability of the linear combination of the subscales was subsequently calculated as:

\[ r_{\text{total}} = \left[1 - \frac{\sum S^2_i - \sum \rho_{ij} S^2_j}{S^2_t}\right] \]

where; \( X_{\text{total}} = X_{\text{sub1}} + X_{\text{sub2}} + \ldots + X_{\text{subn}} \) and \( r_{\text{tt}} = \alpha \) of each subscale

\( S^2_i \) = variance of each subscale and \( S^2_t \) = variance of combination of subscales

Based on this analysis the 28 item full scale DMSEQ’s internal reliability was \((\alpha[rtt]) = .92\). The internal reliability of the full scale was encouraging and comparable to another South African domain-specific self-efficacy beliefs scale (the Entrepreneurial Self-Efficacy Scale Urban, 2006) whose Cronbach \( \alpha \) of .89.

Urban (2006) also demonstrated that the South African designed Entrepreneurial Self-Efficacy Scale (ESE) showed comparatively little difference in scores between Indian, Black and Caucasian groups. In one subscale, ESE innovation (i.e., engage in new ventures, new ideas, new markets/products/technologies), Indian South Africans differed significantly from Black South Africans. The DMSEQ full and subscale differences between black and other managers based on a pilot sample of 146 of which 26 (21%) were black managers was also investigated. A one-way ANOVA revealed no significant difference between black and other
managers on all subscales as illustrated in Table 5.5. In addition, the effect size, calculated using eta squared, ranged from .002 to .01.

Table 5.5 ANOVA. DMSEQ: Anova: Full- and Subscales

<table>
<thead>
<tr>
<th>Factors: Subscale</th>
<th>ANOVA Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Social influence efficacy</td>
<td>[F(1,144) = .001, p &lt; .969]</td>
</tr>
<tr>
<td>2. Exploratory search and processing efficacy</td>
<td>[F(1,144) = .367, p &lt; .546]</td>
</tr>
<tr>
<td>3. Thought and affect control efficacy</td>
<td>[F(1,144) = .411, p &lt; .522]</td>
</tr>
<tr>
<td>4. Risk tolerance efficacy</td>
<td>[F(1,144) = 2.397, p &lt; .124]</td>
</tr>
<tr>
<td>5. Analytical and inferential efficacy</td>
<td>[F(1,144) = 2.366, p &lt; .126]</td>
</tr>
<tr>
<td>6. Full Scale</td>
<td>[F(1,144) = .121, p &lt; .729]</td>
</tr>
</tbody>
</table>

These findings were encouraging and provided a degree of trust in the psychometric properties of the scale to measure self-efficacy beliefs for the purposes of this study. As the five operational indicators displayed respectable psychometric properties in providing a comprehensive empirical understanding of self-efficacy beliefs they were retained as indicators. The internal consistency of the DMSEQ subscales was also encouraging. For example, Bandura's Multidimensional Scales of Perceived Self-Efficacy ranged from \(\alpha = .70\) to \(\alpha = .87\) (Miller, Coombs, & Fuqua, 1999). In addition, one of the most widely used efficacy measures is Sherer et al.'s. (1982) General Self-Efficacy Scale (GSE) (Sherer & Maddux, 1982), originally developed for clinical and personality research. It has also been used in organizational settings. Evidence with regard to the reliability of the GSE scale in organizational studies was moderate to high \(\alpha = .76\) to \(\alpha = .89\) (Gardner & Pierce, 1998; Imam, 2007; Schaubroeck & Merritt, 1997). Chen et al. (2001) also developed a new GSE scale (NGSE) that demonstrated \(\alpha\)'s of between .86 to .90.

Construct Validity

Campbell and Fiske (1959) argued that for the establishment of construct validity, convergent as well as discriminant validation is required. After ensuring that the full scale and subscales of the DMSEQ conformed to their conceptual definitions, the external construct validity of the full scale DMSEQ was investigated by way of both convergent as well as discriminative validity. High discriminant validity is however highly unlikely, particularly in psychology (Byrne, 2006). Convergent validity with the revised Problem Solving Self-Efficacy Inventory (PSI-PSSE: Mayden-Olivares & D’Zurilla, 1997) was used to investigate evidence of
construct validity. This 35 item (inclusive of three filler items) 6-point Likert scale inventory does not assess problem-solving skills but rather the perception of problem-solving beliefs and style. It was argued that low correlates could be construed as partial support for the construct validity of the DMSEQ.

The discriminant validity of the DMSEQ was also investigated by comparing it to the personality trait of confidence. As discussed earlier, self-efficacy beliefs as a context-specific judgment of capability are much more variable than the enduring notions of personality. Self-confidence, measured at a more general level of specificity, includes the evaluation of competence and the feelings of self-worth associated with decision making behaviour (Ferrari, 2001; Ferrari & Dovidio, 2001; Haleblian et al., 2004; Lucas et al., 2006; Mirels et al., 2002; Parker & Fischhoff, 2005). The 15FQ+ (Psychometrics Limited, 2002b) provides for a comprehensive assessment of trait-based personality factors and the researcher compared Factor O (i.e., apprehensive, insecure, self-doubting [Cronbach $\alpha = .81$, $n = 226$, South African managers]) with the full scale DMSEQ.

The DMSEQ was tested by calculating a $3 \times 3$ matrix of zero-order Pearson correlation coefficients. A directional hypothesis (one-tailed) with a 5% significance level was used as support for a low positive relationship with the PSI and a negative relationship with Factor O. The sample of 146 has been described earlier. The results are presented in Table 5.6.

<table>
<thead>
<tr>
<th>Variable</th>
<th>$n$</th>
<th>Mean</th>
<th>$SD$</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. DMSEQ</td>
<td>146</td>
<td>2162.24</td>
<td>290.71</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. PSI-PSSE (Problem Solving Self-Efficacy)</td>
<td>143*</td>
<td>37.10</td>
<td>6.52</td>
<td>.323**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. PSI-PSS (Problems Solving Skills)</td>
<td>143*</td>
<td>44.95</td>
<td>6.08</td>
<td>.498**</td>
<td>.335**</td>
<td></td>
</tr>
</tbody>
</table>

**p < .01, one-tailed; * denotes missing data

Although both the PSI-PSSE and DMSEQ tap into beliefs about individual self-efficacy beliefs, the constructs differ in their scope. The PSI Problem-Solving Self-Efficacy subscale was designed to operationalize beliefs in problem-solving skills, effectiveness or competence...
and, consequently, represents a rather restricted view of self-efficacy beliefs in decision making. The DMSEQ, in contrast, taps into multiplicative constellations of activities in relation to MDM processes that shape decision behaviour. Arguably, it was expected that the PSI would be somewhat distinct from the DMSEQ. In support of discriminant validity, the PSSE subscale of the PSI shared only 11% and the PSI-PSS only 23% of the common variance with the DMSEQ. It is worth noting that, although PSI-PSSE and DMSEQ may share similar antecedents (e.g., actual experience, vicarious experience, verbal persuasion, psychological states [Bandura, 1997]), DMSEQ may be less resistant to ephemeral influences than the PSI when individuals face ill-defined contexts and consequential choices in organizational settings.

Bandura (2005) argues that measures in self-efficacy beliefs are best achieved by focusing on a specific context and activity domain. In this regard, Moritz et al. (2002, p. 282) note that the most important moderator in measurement is that “the structure of the relationship between efficacy beliefs and action requires that both tap similar capabilities”. Moreover, the more task-specific or context-specific one can make the measurement of self-efficacy beliefs, the better the predictive (and possibly explanatory) role of self-efficacy beliefs is likely to play in task-specific outcomes of interest (Bandura, 1997; Pajares, Hartley, & Valiante, 2001).

Confidence is a relatively stable individual characteristic and basically reflects a generalized self-efficacy belief (Chen et al., 2000). Confidence is, however, distinct from the malleable, context-specific self-efficacy beliefs (Bandura 1997). Given the highly conditional nature of self-efficacy beliefs it was unrealistic to expect that confidence as a trait, cast in non-conditional generalities, would display convergence with DMSEQ. The findings demonstrated that DMSEQ was empirically distinct and shared little common variance with confidence as a trait (i.e., only 8%). This provided empirical evidence to suggest that self-efficacy beliefs are indeed different from confidence as a static trait disposition.

In conclusion, the DMSEQ displayed an acceptable factorial composition and homogeneity among its items that provided the necessary confidence to use it in the present study. In addition, the DMSEQ displayed respectable internal consistency for its subscales and the discriminant validity evidence confirmed DMSEQ as an acceptable operational indicator for self-efficacy beliefs. The next subsection describes decision-generated affect as a multidimensional variable.
**Decision-Generated Affect**

As reactions to appraisal-generated representations of situations with respect to positive or negative implications for goals, decision-generated affect was conceptualized as a multidimensional construct where immediate affect was represented as thought and emotional interference that disrupts on-task attentional resources allocation that compete with available attentional resources (Beal et al., 2005; Carver, 2004; DeShon et al., 1996; Kanfer & Ackerman, 1996; Sarason et al., 1996; Weiss et al., 2005). Conversely, anticipated affect was conceptualized as self-evaluative and social comparative concerns about personal competence, vulnerability and the consequences of one’s decisional prowess (Bandura, 1991; Bandura & Jourden, 1991; Brown et al., 2007; Buunk, Ybema, Gibbons, & Ipenburg, 2001; Larrick et al., 2007; Moore, 2007).

**Operationalization: Scale development**

Decision-generated affect was defined as the subjective emotions, moods, and evaluations that are elicited by the perception that there is a meaningful decision to be made in order to resolve multiple, viable, competing options that require individuals to prioritize some goal(s) over another (others). Unlike affective dispositions (i.e., neuroticism, emotionality), which are enduring traits over time, affective states are not well conceptualized as between-individuals constructs and are not characteristic of individuals since they are inherently transient experiential states or outcomes that vary meaningfully within individuals over time (see for example, George, 1996; Kaplan, Bradley, Luchman, & Haynes, 2009).

Watson, Clark, and Tellegen (1988) developed the Positive (PA) and Negative Affect (NA) Schedule (PANAS) as a reliable (alpha reliabilities of the PANAS PA and NA scales were .86 and .87) and valid measure of these two important affective states. High PA reflects the extent to which an individual feels enthusiastic, active, and alert in a state of high energy, full concentration, and pleasurable engagement. Conversely, low PA is characterized by sadness and lethargy. In contrast, NA is a general dimension of subjective distress and un pleasurable engagement that subsumes a variety of aversive affective states, including anger, contempt, disgust, guilt, fear, and nervousness, with low NA being a state of calmness and serenity.
Thompson (2007) modified the scale which resulted in the International PANAS Short Form (I-PANAS-SF) in a series of validation studies ($N = 1789$). The cross-sample stability, internal reliability, temporal stability, cross-cultural factorial invariance, and convergent and criterion-related validities demonstrated that the I-PANAS-SF can be offered for cross-cultural, English-based studies as a brief research tool that is reliable, valid, and efficient as a means of measuring and further investigating PA and NA. The ‘Profile of Mood States’ (McNair, Lorr, & Droppleman, 1992) is a similar scale of six identifiable affective states.

Although these scales demonstrated usefulness in studying qualitatively distinctive intra-individual affective state fluctuations within-individual investigations (see, for example, Watson et al., 1988), they are not domain-specific with regards to decision making. In the absence of a suitable decision-generated affect scale, a domain-specific self-report scale was developed in order to measure experienced affect retrospectively following the decision making simulations. The scale was designed to capture experienced affect during decision making, as well as cognitive predictions (or forecasts of affective consequences) as anticipated (i.e., more distal) affect.

The design of the decision-generated affect scale was developed using a modification of Kanfer and Ackerman’s (1989) self-report questionnaire that was designed based on the studies by Sarason, Sarason, Keefe, Hayes, and Shearin (1986). These latter authors describe two instruments constructed to assess intrusive thoughts. One instrument obtains self-reports of cognitive interference immediately after performance on a task. The other one assesses the general tendency to experience intrusive thoughts. Their results suggest that these items are valuable in order to assess thoughts pertaining to evaluative negative and positive self-reactions and off-task thoughts. The present researcher selected 22 items and reworded some of these in order to represent a pre-occupation with personal deficiencies, social comparative and self-evaluative concerns about personal competence (self-referent intrusive thinking), experienced time pressure (somatic tension) and disruptive emotions (vulnerability to adverse effects of failure, positive self-reactions, and off-task thoughts). Sarason et al. (1996) suggest that these measures can be practically useful in identifying individuals who are at risk for experiencing debilitating preoccupations when confronting the challenges posed by particular situations as influenced by situational parameters. In fact, there is evidence suggesting that such off-task
cognitive interference can be increased by emphasizing the evaluative aspects of the performance situation.

The custom designed decision-generated self-report questionnaire comprised of items to assess the frequency and occurrence of these various types of thoughts and affect using a 5-point Likert rating scale (1 = never through to 5 = very often), to indicate how frequently the thought described in each statement occurred while performing a just completed task. In particular, items assessed attention to task components, thoughts pertaining to performance evaluation, negative and positive self-reactions, and off-task thoughts. The internal consistency reliability estimates of the composite scales for different self-report variables ranged from .32 to .85.

Sample and procedure

Data was collected on 112 experienced managers (with a mean age of 39.6 years, SD = 7.5). Eighty-two percent were graduates and postgraduates and 18 were black managers. The items were presented in such a manner as to elicit a response in terms of the frequency of affective reactions experienced during decision simulation exercises. The instructions were formulated as follows:

“During these exercises, how much and frequently were you concerned about the item in question”. Use the scale below to record your response to each item.

1 = rarely (less than 10% of the time); 2 = occasionally (about 25% of the time); 3 = sometimes (about 50% of the time); 4 = frequently (about 75% of the time); 5 = usually (more than 90% of the time).

Item reduction and reliability

The EFA resulted in reducing the scale from 22 to 13 items. The items, together with their loadings on two primary factors, are shown in Table 5.7. The Kaiser-Meyer-Oklin value was .82, which exceeded the recommended value of .60 and the Barlett’s Test of Sphericity reached statistical significance, supporting the factorability of the correlation matrix. Consistent with extant research, a two-factor structure emerged that reflected distal predictions (or forecasts) about the affective consequences of decisions, and immediate affective
experiential states and physiological responses under time pressure. In respect of the former, Loewenstein and Lerner (2003, p. 620) argued that “expected emotions are not experienced as emotions \textit{per se} at the time of decision making; rather, as the label suggests, they are expectations about emotions that will be experienced in the future”. The latter, immediate affect, reflects arousal experienced in response to time pressure and making accurate decisions that can disrupt on-task attentional resources effort allocation by redirecting attention to the affective experience and physiological arousal (see, for example, Luce, 1998, 2005, Luce et al., 1997; Luce et al., 2001).

Table 5.7 Decision-Generated Affect: Standard Regression Coefficients obtained via EFA Oblimin Rotation with Kaiser Normalization

<table>
<thead>
<tr>
<th>Decision-generated affect items</th>
<th>Factor 1</th>
<th>Factor 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>feeling unable to influence the demands placed on me</td>
<td>.794</td>
<td></td>
</tr>
<tr>
<td>feeling that I have little control to perform at my best</td>
<td>.767</td>
<td></td>
</tr>
<tr>
<td>how dissatisfied I was with my performance</td>
<td>.728</td>
<td></td>
</tr>
<tr>
<td>concerns about not making a fool of myself</td>
<td>.701</td>
<td></td>
</tr>
<tr>
<td>feeling discouraged about my progress and performance</td>
<td>.700</td>
<td></td>
</tr>
<tr>
<td>not to be among the poorest performing managers</td>
<td>.687</td>
<td></td>
</tr>
<tr>
<td>thinking that other managers are naturally better in decision making than me</td>
<td>.686</td>
<td></td>
</tr>
<tr>
<td>how poorly I was doing</td>
<td>.675</td>
<td></td>
</tr>
<tr>
<td>the quantity of work I was expected to do given the time allowed</td>
<td></td>
<td>.876</td>
</tr>
<tr>
<td>how pressurized I was to perform these tasks/exercises, given the time allowed</td>
<td></td>
<td>.875</td>
</tr>
<tr>
<td>about how much time I need to complete the exercises</td>
<td></td>
<td>.861</td>
</tr>
<tr>
<td>focusing my attention on making few errors in the time-based measures and avoid failure</td>
<td></td>
<td>.660</td>
</tr>
<tr>
<td>feeling that I worked under a great deal of tension</td>
<td></td>
<td>.626</td>
</tr>
<tr>
<td><strong>Percentage of variance</strong></td>
<td>35.0</td>
<td>11.7</td>
</tr>
</tbody>
</table>

The two factors confirmed the multi-dimensionality of decision-generated affect. To assist in interpretational clarity Factor 1 was labeled as \textit{Anticipated Affect} (i.e., self-evaluative
and social comparative concerns) and Factor 2 as *Immediate Affect*. These affective outcomes represent cognitive interference (Carver, 2004; Sarason et al., 1996), intrusive cognitions (Bandura, 1997; Carver et al., 1989; Kuhl, 1992; Wood & Bandura, 1996), rumination (Baumeister et al., 1994; Baumeister et al., 2007; Brief & Weiss, 2002), and disruptive arousal and affect (Bandura, 1999; Lerner, Han, & Keltner, 2007; Mano, 1992; Pham, 2007).

Table 5.8 illustrates the decision-generated affect scale means, standard deviations, and the internal consistency of the two sub-scales.

<table>
<thead>
<tr>
<th>Subscale statistics</th>
<th>Factor</th>
<th>Mean</th>
<th>SD</th>
<th>Number of items</th>
<th>Cronbach α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticipated affect</td>
<td>13.82</td>
<td>5.90</td>
<td>8</td>
<td>.879</td>
<td></td>
</tr>
<tr>
<td>Immediate affect</td>
<td>14.58</td>
<td>5.08</td>
<td>5</td>
<td>.859</td>
<td></td>
</tr>
</tbody>
</table>

The satisfactory factorial composition and internal consistency properties of the 13-item decision-generated measure displayed respectable psychometric properties for the purposes of the present study. A one-way ANOVA revealed no significant difference between black and other managers on both subscales. In addition, the effect size, calculated using eta squared, ranged from .001 for immediate affect to .006 for anticipated affect.

**Construct Validity**

The measure was also investigated for discriminant validity in relation to Factor O (apprehensive, insecure, self-doubting) of the 15FQ+ (Psychometrics Limited, 2002b). Table 5.9 illustrates the discriminant validities.

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Anticipated affect (Y₇)</td>
<td>111</td>
<td>13.82</td>
<td>5.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Immediate affect (Y₆)</td>
<td>111</td>
<td>14.58</td>
<td>5.08</td>
<td>.427**</td>
<td></td>
</tr>
<tr>
<td>3. Factor O:(Apprehensive, insecure, self-doubting)</td>
<td>111</td>
<td>11.51</td>
<td>5.67</td>
<td>.108</td>
<td>.316**</td>
</tr>
</tbody>
</table>

**p < .01, one-tailed

A sample of 111 was available to compare Factor O with immediate and anticipated affect. Consistent with other research (Baumeister et al., 2007; Loewenstein & Lerner, 2003),
immediate and anticipated affect were found to be interrelated and complementary ($r = .427$, $n = 111$, $p > .01$, one-tailed). The main feature of Factor O as an aversive dispositional trait is its stability over time and consistency across tasks (or situations). Accordingly, individuals high on Factor O are likely to display a pronounced bias toward making risk avoidant choices (see, for example, Ferrari, 2001; Forgas & Laham, 2005; Haleblian et al., 2004; Hockey et al., 2000; Lauriola, Levin, & Hart, 2007). Dispositional anxiety is thus incidental and unrelated to the decision at hand (Loewenstein & Lerner 2003; Maner et al., 2007; Pham, 2007).

The findings in Table 5.9 confirm that Factor O and immediate affect are independent of anxiety as a dispositional trait. Anxiety is thus incidental to immediate decision-generated affect ($r = .108$). Factor O however demonstrated a positive relationship with anticipated affect ($r = .316$, $n = 111$, $p > .01$, one-tailed). The effect size was, however, small ($r^2 = .010$). This was to be expected since anticipated affect consists of cognitive predictions (or forecasts) based on an attentional bias toward threats as well as an exaggeration of anticipated positive or negative consequences and concerns.

One possible limitation with the results is that they may have been inflated by common sources of variance. In interpreting the findings, it is important to recognize the limitations of the potential bias of retrospective accounts of the scale. The measurement approach may have resulted in a form of self-generated validity in which responses to one part of the scale are reactive to another, although these were administered in a temporal order with personality traits measured last. Because all variables were self-reported, one may wonder whether the relations were inflated. Although the scale was psychometrically justified, it may have obscured patterns of other emotions that are difficult to capture. Also, individuals’ affect may have been influenced by a variety of factors such as features of the specific simulations, associations, memories or thoughts about events outside the context of the assessment (Brown et al., 2005; Judge et al., 2006; Roseman & Evdokas, 2004).

The operationization of the allocation of attentional resources is discussed in the next subsection.

**Allocation of Attentional Resources**

It has been argued that there is considerable volition that permits individuals to exert more or less effort despite how difficult they perceive the task to be. For instance, Yeo (2003)
illustrated this by showing a significant linear relationship between effort and perceived difficulty. Consequently, it is argued that the motivational and volitional impact of decision-generated affect induce complex cognitive, affective, and behavioural processes that underlie decisional avoidance (see, for example, Anderson, 2003; Ferrari, Johnson, & McCown, 1995; Renn et al., 2005; Van Eerde 2000).

**Decisional Fatigue**

It was argued that decisional fatigue disables individuals from accessing enough attentional resources necessary for effective decision making as a consequence of attentional resources conservation. Fatigue operates as a signal for reducing attentional resources allocation and alters further increments of attentional effort (Loewenstein, 1996) and, subsequently, the desirability of acting (i.e., making choices). Fatigue thus favours passive-evasion and avoidance options in decision making (Baumeister et al., 1998).

In this study individuals were subjected to intertemporal decisions (i.e., making decisions at different points in time) and the nature of the two simulations in quick succession required them to make choices among options that exhausted the attentional resources necessary for effective subsequent decision making. The extant research suggests that fatigue induces an aversion to expend effort and therefore signals a threat from an over-commitment of attentional resources (see, for example, Finkel et al., 2006; Hockey et al., 2000; Schmeichel, Vohs & Baumeister, 2003; Vohs et al., 2008; Vohs et al., 2005). Fatigue reduces persistence, alters the desirability of making decisions and decreases the desirability of further increments of effort. Accordingly, fatigue favours passivity, indecision and decisional avoidance for reasons other than declining motivation.

**Operationalization**

Fatigue was measured by a factor analytically derived adjective rating scale, ‘Profile of Mood States’ (McNair et al., 1992), measuring six identifiable mood or affective states. The researcher used the 7-item Fatigue-Inertia (weariness and fatigued) scale which was administered after completion of the decision simulation exercises. This scale was chosen in order to measure an individual's typical and persistent mood reactions to their current situation
because it was suitable to measure affect over a very brief rating period and thus suitable to focus on relatively recent affective reactions. The inventory provides for a high degree of sensitivity to change in subjective states. The publisher has reported acceptable psychometric properties with reliabilities being highly satisfactory (internal consistencies are near .90 or above). Further, test-retest reliability over three time periods have suggested reliability estimates that range from .65 to .74 across shorter time intervals. However, over longer periods this decreases to .43 to .52. This is far less than the .80 levels expected for context independent stable personality constructs. The test developer reports research across psychotherapy studies, outpatient substance abuse, cancer research, emotion-inducing situations, and sport performance.

The researcher could only perform a one-way ANOVA on the final study sample of 196 managers in order to obtain representativity of black and other managers. The results revealed no significant difference between black and other managers. A one-way ANOVA for immediate affect revealed no significant difference between black and other managers \([F(1,194) = .220, \ p < .640]\). For anticipated affect, a one-way ANOVA also revealed no significant difference between black and other managers, \([F(1,194) = .003, \ p < .954]\).

**Decisional Procrastination**

Various authors have argued that decisional procrastination is a result of proximal motivational-affective states rather than distal individual influences (i.e., personality traits) (see, for example, Renn et al., 2005; Steel, 2007; Van Eerde, 2000). Individuals who doubt their ability to make good decisions, in combination with a low dispositional variation in their sense of certainty and personal control, tend to alter their experienced affect (see, for example, Haleblian et al., 2004; Lucas et al., 2006; Mirels et al., 2002; Raghunathan & Pham, 1999). Affect minimization concerns (Bettman et al., 1998) thus impact on the willingness or the expenditure of attentional resources in order to translate intentions into action. Avoidant, evasive and escape behaviours (Anderson, 2003, 2007) reflect attempts to circumvent decision-generated affect in order to pursue positive affect (Baumeister et al., 2007; Schwarz & Clore, 2007; Spunt, Rassin, & Epstein, 2009). In order to operationalize the allocation of attentional resources the present researcher used decisional procrastination as a means of coping with decision-generated affect.
It has been pointed out that making a decision is a volitional action among alternative courses of action (Payne et al., 1993). There is considerable volition that permits individuals to exert more or less attentional resources despite how difficult they perceive decisions to be. Decisional procrastination thus represents a volitional response for inaction by way of attentional resources withdrawal to engage in deliberation and the willingness to exercise a rational display of social influence and control in order to make decisions. Accordingly, volitional acquiescence blunts a manager’s willingness to deploy attentional resources to act on the opportunity-affording features of a decision and thus makes them favour the maximization of positive affect by the avoidance of decisions (Patalano & Wengrovitz, 2007).

*Operationalization*

Little empirical research has addressed the measurement of decisional procrastination (Rassin et al., 2007). As far as could be ascertained only two measures exist. The most common self-report scale measures of indecisiveness are Frost and Shows’ (1993) 15-item Indecisiveness Scale (IS) and Mann’s (1982) 5-item Decisional Procrastination Scale (DP) based on the Conflict Theory of decision making (Janis & Mann, 1977). The Decisional Procrastination Scale focuses on decisional delay, with items such as “I put off making decisions” and “I waste a long time on trivial matters before getting to a final decision.” The Indecisiveness Scale, in addition to delay, incorporates decisional difficulty, as in “I find it easy to make decisions” or “I always know exactly what I want,” and it proposes affective components including anxiety, worry, low confidence, and regret. These two scales reflect different views on the major components of indecisiveness, that is, delay only versus a combination of difficulty, delay and negative affect. Despite this, both scales are highly reliable, with the internal reliabilities somewhat higher for the Indecisiveness Scale (internal α = .87; temporal stability (one month) test-retest α = .67 (Frost & Gross, 1992; Wengrovitz & Patalano, 2006) than for the Decisional Procrastination Scale (internal α = .70; 1-month test-retest α = .69 (Beswick, Rothblum, & Mann, 1988; Effert & Ferrari, 1989).

Rassin et al. (2007) found supporting evidence for the validity of the IS. Their findings, however, indicated that 5 items did not load adequately on the scale. It was decided to employ the DP in the present study because the scale measures volitional actions when individuals are faced with conflicts and choices in addition to its relatively widespread usage. A number of
studies have used the scale (see, for example, Burnett, Mann, & Beswick, 1989; Effert & Ferrari, 1989; Ferrari, 1994; Ferrari & Dovidio, 2000, 2001; Orellana-Damacela et al., 2000). High scores on this scale indicate a tendency to put off decisions.

As was the case with decision-generated affect, a one-way ANOVA was performed on the total sample of managers ($N = 194$). The results revealed no significant difference between black and other managers [$F_{(1,194)} = .002, p < .963$]. The DP was subsequently used to operationalize the degree to which individuals engage in attentional resources minimization strategies when they face decisional conflict.

**Quality of MDM Processes and Outcomes**

In Chapter Two MDM was conceptualized as a cognitive problem of attempting to arrive at an accurate (rational) solution (mostly under pressure of time), and choosing between multiple goals (i.e., make decisions against a background of divergent political interests) (Elbanna & Child, 2007; Ferris et al., 2002; Papadakis, 2006). The quality of MDM processes is measured in the present study by using two business simulations that encompass the types of decisional activities required in complex dynamic environments (i.e., exercising a systematic-comprehensive process and influencing others to gain agreement). Simulations are valuable in reproducing the behaviours of the real world and offer a viable solution by controlling many potentially confounding variables while maintaining contextual relevance (Hough & White, 2003) in order to ‘achieve parity in relevance’ with studies conducted in natural contexts (Dutton & Stumpf, 1991).

Simulations as ambiguous behavioural situations offer a unique opportunity to provide objective measures of the variability in individual differences in behavioural responses in order to examine the quality of decision making processes at the individual level of analysis (see, for example, Hough et al., 1998). Consequently, they avoid the potential bias of retrospective accounts since stimulus materials are realistic, engaging and immune to demand effects. Chan and Schmitt (1997) argued that individual decision making is nearly always multidimensional in nature in the sense that an adequate solution or handling of the problem would involve several ability and skill dimensions. Decision making in simulations reflects more than just cognitive ability (Parker & Fischhoff, 2005), and overconfidence and individual-difference
measures of affect (including optimism), conscientiousness, extraversion, social cognition (need for cognition, self-monitoring, self-efficacy), experience and cognitive ability have been shown to correlate with decision making (see, for example, McDaniel et al., 2001; Weekley & Jones, 1999; Weekley & Ployhart, 2005; Wolfe & Grosch, 1990). Table 3.1 in Chapter Three illustrates the frequency with which simulations have been used in order to study MDM.

The two simulations utilized provided an opportunity to measure the application of a procedurally rational decision process, as well as the ease to demonstrate rational social influence and independence in decision making.

**Procedural Rationality**

The conceptual and empirical research suggests a strong association between the application of an effortful, controlled decision process and the quality of decisional outcomes (e.g., Bazerman, 2006; Dean & Sharfman, 1993b, 1996; Goll & Rasheed, 1997; Hough & White, 2003; Payne & Bettman, 2007; Tasa & Whyte, 2005). Consequently, a more rational, systematic-comprehensive decision process is adopted when decision accuracy is prioritized over saving cognitive effort (attentional resources) in order to meet the best interests of the organization.

The application of such an effortful, rational, systematic-comprehensive process, also referred to as motivated processing (Forgas et al., 2004) or System 2 (Evans, 2003, 2008; Kahneman, 2003; Stanovich & West, 2000), leads individuals to process and deliberate with information more vigilantly (Janis & Mann, 1977; Tabernero & Wood, 1999). It makes the decision process more attuned to normative rationality and tends (on average) to lead to better outcomes than do poor decision making processes (Frisch & Clemen, 1994; Kleindorfer et al., 1993). The underlying assumption regarding the use of a systematic-comprehensive decision-process is that it requires greater attentional resources (Baumeister et al., 1994; Connolly & Ordonez, 2003) in the use of appropriate information and analysis (Kahneman, 2003) and greater use of such a process results in better solutions to more complex problems (Leaptrott & McDonald, 2008; Stanovich & West, 2000).

Dean and Sharfman’s (1993a) definition of procedural rationality was adopted as an effortful systematic-comprehensive process to reflect the quality and extent to which the
decision process involves the collection of information relevant to the decision and the reliance on analysis of this information in making an accurate decision.

The next subsection describes the measurement of procedural rationality for the purposes of this study.

*Operationalization: Simulation 1*

The first simulation, Critical Business Planning (CBP; Psychometric Research & Development, 1998), is a 40-minute, time-based paper and pencil business decision making simulation inventory. The inventory consists of 48 decision scenarios based on a business de-merger scenario and provides a measurement of performance in discerning apparent patterns embedded in complexity, use and reason with business information presented in graphs, tables and charts, hypothesis testing and finding effective concepts to operate with, rather than working to pre-set patterns. The simulation requires a reasonable level of verbal comprehension, reasoning and numerical abilities, and the stimulus materials are realistic, engaging and immune to demand effects since individuals are required to discover and learn the concepts and methods underlying information presented to them and to apply these to novel situations (e.g., organizational structure changes, budget variances, legal and IT problems, and staffing). For these reasons the present researcher viewed the simulation as an appropriate measure to provide an objective measure of the variability in individual differences in procedural rationality at the individual level of analysis. Procedural rationality was calculated as the difference between the number of cases attempted and the actual number of correct decision responses (i.e., the application of an effortful decision process in order to achieve decision accuracy goals). Poorer performance was regarded as evidence of failure to differentiate between information that is relevant or irrelevant, reliable or unreliable, supportive or non-supportive to the interests of decision accuracy.

A large discrepancy between attempted items and correct items was regarded as evidence of premature closure (Eisenhardt, 1989) and hypervigilance (Janis & Mann, 1977) as a result of individuals’ reactions to a threat in conditions characterized by informational overload and a lack of time to search and deliberate. Low scores could thus be construed to reflect attentional effort minimization concerns in order to escape decision-generated affect posed by the situation. Cheng (2003) showed the need for closure is a motivational process in
order to bring information processing to a close by leaping to a conclusion as an individual difference in coping.

The publisher has conducted a variety of analyses to investigate the impact on reliability and/or the standard error of measurement, and whether reliability varies by gender or ethnic group and reports no significant or even modestly substantial variation was found, with estimates of reliability varying by no more than about .02 either side of $\alpha = .73$. Moreover, the present researcher confirmed the reliability (K-R 21 of .74) to be very similar to that of the publisher (K-R 21 of .73) in a separate analysis from the present study. Further, the publisher reports that in the development sample there were no statistically significant differences between males and females, or between white and other ethnic groups. In their development sample black managers, however, performed somewhat poorer with the average number of correct responses for black managers as 47.88 compared with 56.00 for other managers. These differences correspond to about .72 and 1.3 standard deviations respectively. Following a more detailed examination, it was revealed that the difference in average scores between black and other managers in the development sample reflected language and educational differences, not ethnic differences *per se*, and may be largely a matter of speed / error trade-off.

The present researcher has standardized the simulation for South African conditions and has investigated the results of the simulation based on a separate sample of 390, of which 31% were black managers ($M = 35.26, SD = 13.98$), with the remaining managers ($M = 36.59, SD = 13.26$). A one-way ANOVA revealed a significant difference between black and other managers [$F(1,368) = .812, p < .368$]. The actual difference in mean scores between the groups was quite small. The effect size, calculated using eta squared, was .002 which was considered small (Cohen, 1988).

Other than the application of a procedurally rational process, MDM is also a process that relies on elaborate and complex social patterns of social-political influence and social encounters in order to influence final decisions (Bandura, 2001; Beach & Connolly, 2005; Zaccaro, 2001). As managers’ work is enmeshed in webs of interdependent relationships they are required to defend their decisions and reasoning to peers, subordinates, or superiors (Brousseau et al., 2006; Green et al., 2000; Lerner & Tetlock, 2003; Sedikides & Herbst, 2002). This requires that managers exercise social influence in order to resolve divergent interests and
counteract the political interests of divergent groups (Hochwarter et al., 2007; Lucas et al., 2005; Schwarzwald et al., 2004; Sullivan et al., 2003; Wayne et al., 1997; Zaccaro, 2001).

The following subsection introduces the use of the second simulation in order to operationalize rational social influence and independence in making a decision in the service of quality decision outcomes obtained in a face-to-face situation. Rational social influence is defined for the purpose of the present study as the willingness and ease to assume independence in decisions (i.e., the readiness to make decisions and the low susceptibility to social opposition) in order to advance compliance in the service of accuracy of decisions. To exercise rational social influence requires an effortful decision process (i.e., an increased level of attentional effort to meet accuracy goals) in order to justify their decisions in anticipation of how it will be evaluated by others given the unknown interests of others and the legitimate reasons for inquiring into the reasons behind the manager’s decisions.

*Operationalization: Simulation 2*

The second simulation is a standardized role-play (Sigma, 2000) employed to observe and measure social influence and persuasive behaviour. It has been pointed out that traits-as-dispositions and situational properties activate relevant behaviours that low support environments compel individuals to activate social skill. Consequently, role play simulations provide a high activation potential in order to elicit behaviour to aid observations of individuals’ behaviour. As individuals necessarily differ in the cues presented, these observations are fruitful and informative with regard to social influence (Lievens et al., 2006; Tett & Burnett, 2003).

*Procedure*

Individuals are provided with background information and detail relating to funding for a specific project that needs to be obtained. They are granted 20 minutes to study the brief and 30 minutes to present their position in an interactive situation. The exercise provides observational data on how well an individual is able to define a problem, chose the best business alternative, and influence and persuade others to accept a financial business proposal.
Sample

A pilot sample (i.e. non-probability, purposive sampling) of 150 managers, with at least ten years experience in management, employed in the private sector (financial, utilities, oil, pharmaceutical, IT technology, manufacturing, fast moving consumer goods, professional firms, and agriculture) was used to evaluate the measure. The mean age was 39.9 years ($SD = 7.9$), 85% were graduate and postgraduates, 16% were black and 67% were males. The sample represented experienced managers with good educational achievements, industry experience and accomplishments.

Item Reduction and Reliability

Guided by the publisher’s scoring manual, conceptual frameworks and previous research (Ferris et al., 2007; Hochwarter et al., 2007; Koslowsky & Schwarzwald 2001; Liu et al., 2007; Schwarzwald et al., 2004; Sullivan et al., 2003), a 20-item observation scale was designed in order to record observations during the simulation. A six-point ordinal scale that permitted the classification of observations was used and ranged from “Not at all true of individual (to no degree or extent)” to “Definitely true of individual (to a great degree and with no doubts at all)”. One limitation of the measure was the failure to evaluate interrater reliability.

The 20 item measure’s EFA and internal consistency reliability analysis details are presented in the discussion that follows. The items, together with their loadings on their primary factors, are shown in Table 5.10.
The correlation matrix revealed many coefficients above .3 and the Kaiser-Meyer-Oklin value was .87, which is above the recommended value of .60. The Barlett’s Test of Sphericity also reached statistical significance, supporting the factorability of the correlation matrix. The four factors are described in the next subsection.

<table>
<thead>
<tr>
<th>Social Influence Items</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identified the key areas for negotiation and the evidence available in a logical and unbiased manner</td>
<td>.907</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Showed an awareness of all the variables that can be manipulated in reaching a solution</td>
<td>.904</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selective and constructive in the use of information used to support proposals</td>
<td>.866</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpreted information soundly/correctly and arrived at appropriate solutions</td>
<td>.835</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confident when describing or defending own position; had a good grasp of the facts</td>
<td>.806</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expertise claimed frequently, presented self as knowledgeable and capable</td>
<td>.802</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continued trying to persuade of the value of proposed solutions, persistent in effort</td>
<td>.749</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Made a number of influence attempts, even when confronted with opposition and resistance</td>
<td>.727</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presents arguments convincingly</td>
<td>.651</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Funding agreement secured</td>
<td>.797</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time taken to reach acceptable decision</td>
<td>.765</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Royalty agreement secured</td>
<td>.710</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Used bargaining to influence competitor-offer</td>
<td>.792</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conceded points rather than attempting to turn them around</td>
<td>-.583</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experienced information as sufficient enough to make the decision</td>
<td>.915</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Needed less information and time, displayed less need to talk to others, no delay in decision-making</td>
<td>.891</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of variance</td>
<td>46.5</td>
<td>12.3</td>
<td>7.4</td>
<td>6.7</td>
</tr>
</tbody>
</table>
Rational Social Influence

Table 5.10 shows that 16 items loaded on four factors that accounted for 72.8% of the variance. Nine items loaded substantially on Factor 1 which was labeled as Rational Social Influence (i.e., reliance on relevant information in deliberation and persistence in verbal reasoning in arguments to influence proposals when confronted with opposition). It has been pointed out that making decisions is often the result of a form of negotiation, sometimes covert, sometimes overt, in order to influence the problem definition and option formulation as well as exercise an influence on the final decision (Beach & Connolly, 2005). Engaging in such social influence requires a blend of soft and hard tactics and Mayer (2005, p. 299) has argued that behaviour such as political skill “represents the expression of personality in a socially adaptive fashion. It includes social skills, role knowledge, and emotionally preferred expressions”. The empirical review has illustrated significant relations between ease of social influence (political skill) and upward appeal and forming coalitions (Ferris et al., 2005) and also that political skill is a significant and positive predictor of rationality that enable individuals to make better decisions (Kolodinsky et al., 2007).

For the purposes of this study the researcher conceptualized rational social influence as a multidimensional construct that represents the application of an effortful process to gather and analyse relevant information for rational deliberation in order to persuade and to obtain cooperation and resources to advance decisions in the service of the accuracy of those decisions. This conceptualization thus includes the willingness and ease to exercise rational and supportive modes of influence in order to gain compliance in accepting decisions that promote accuracy, even in cases where opposition is likely to be high. In accordance with this conceptualization the extracted items provided a good empirical grasp of behaviours that make up rational social influence and were thus retained.

Decision Quality

One advantage of the simulation was that the criteria for a successful agreement were stringent, requiring participants to make a decision within the pre-specified time limit and secure a favourable agreement based on objective and quantifiable financial data. Therefore, the assessment of the quality of the final decision was methodologically objective and scored to
a pre-determined set of quantitative criteria and time taken. Objective evaluation of the final outcomes was noted in terms of a scoring key for actual funding and royalty agreements achieved in real monetary terms, as well as the time taken (in minutes) to reach the agreement. A three-point ordinal scale was used ranging from “Less than specified” to “More than specified”. This index provided for an objective index of decision quality. Factor 2 consisted of three items to this effect.

*Bargaining*

Factor 3 is represented by two items, that were labeled as *Bargaining*. The orthogonal (uncorrelated) relationship between rational social influence and the use of bargaining was encouraging. Bargaining is a complex, indeterminate, and personally involving cognitive task that is likely to induce effort minimization goals. Negative affect produces pessimistic and negative thoughts that induce individuals to engage in bargaining tactics to circumvent decision-generated affect. Bargaining is conceptualized in this study as attempts to use coercive tactics for quick closure in order to reduce uncertainty (i.e., ending the decision before all the relevant information has been examined). Dysfunctional cognitions inhibit social behavioural responses and prevent the demonstration of the social skills irrespective of the social skills knowledge individuals possess. Consequently, individuals with less confidence view risky interpersonal endeavors (for example, requests and negotiation) as potential threats to be avoided whereas confident individuals select more rational modes of influence.

*Independence in Decision Making*

The items in Factor Four were indicative of a willingness to make independent decisions (i.e., refrain from making a decision, or a delay or deferral to avoid a decision). Bandura (1982) observes that the exercise of personal control carries considerable responsibility for the negative consequences of decisions and actions and such burdensome aspects dull the appetite for personal control. Furthermore, independence in decision making is a function of the level of perceived individual control. Individuals who doubt their influence prowess tend to shy away from accountability for independent decision making (Jatulis & Newman, 1991; Mirels et al., 2002). Lucas et al. (2006) demonstrated that individuals who are
highly resistant to social influence do so primarily because they perceive both independence and their influence attempts to be subjectively less difficult. They are thus less likely to acquiesce when opposed. Consequently, as tasks become more difficult, individuals tend to become more susceptible to the influence of others. Perhaps the most dramatic examples of task difficulty affecting social influence are derived from Janis’s (1972) research on groupthink, which demonstrated that difficult tasks facilitate the perception of stress. Task difficulty generally increases the potential for individuals to demonstrate groupthink (see also, Tasa & Whyte, 2005). Deferral of a decision is thus a willingness to avoid the exercise of independence in decision making in order to reduce negative affect (Anderson, 2003, Luce, 1998).

The two items that loaded on Factor 4 were used as operational indicators to represent Independence in decision making.

**Overall Scale Statistics**

The satisfactory factorial composition of the observation scale also displayed respectable internal consistency for Factors 1 and 4 (rational social influence and independence in decision making) as illustrated in Table 5.11.

<table>
<thead>
<tr>
<th>Scale item</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>Number of items</th>
<th>Cronbach α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rational social influence</td>
<td>150</td>
<td>34.32</td>
<td>10.10</td>
<td>8</td>
<td>.942</td>
</tr>
<tr>
<td>Decision quality</td>
<td>150</td>
<td>7.46</td>
<td>2.42</td>
<td>3</td>
<td>.682</td>
</tr>
<tr>
<td>Bargaining</td>
<td>150</td>
<td>8.88</td>
<td>2.13</td>
<td>2</td>
<td>.627</td>
</tr>
<tr>
<td>Independence in decision making</td>
<td>150</td>
<td>8.57</td>
<td>3.45</td>
<td>2</td>
<td>.858</td>
</tr>
</tbody>
</table>

One-way ANOVA’s revealed no significant difference between black and other managers on all these subscales. In addition, the effect sizes, calculated using eta squared, were small.

**Construct Validity**

The construct validity of the subscales was further investigated by calculating a matrix of zero-order Pearson correlation coefficients. The measure was also investigated for discriminant validity in relation to Factor O (apprehensive, insecure, self-doubting) of the
15FQ+ (Psychometrics Limited, 2002b). Descriptive statistics and intercorrelations are provided in Table 5.12.

Table 5.12 Rational Social Influence and Independence: Means, Standard Deviations and Intercorrelations

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Rational social influence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Decision quality</td>
<td></td>
<td></td>
<td>.396**</td>
<td></td>
</tr>
<tr>
<td>3. Bargaining</td>
<td>.102</td>
<td></td>
<td>.344**</td>
<td></td>
</tr>
<tr>
<td>4. Independence in decision making</td>
<td>.519**</td>
<td>.465**</td>
<td>.201**</td>
<td></td>
</tr>
<tr>
<td>5. Factor O: (Apprehensive, insecure, self-doubting)</td>
<td>-.090</td>
<td>-.042</td>
<td>.098</td>
<td>-.042</td>
</tr>
</tbody>
</table>

** p < .01, one-tailed

As expected, stronger rational social influence showed a significant positive relationship with decision quality and independence in decision making. Bargaining was distinct from rational social influence but also showed a significant linear relationship with the quality of the decision and independence in decision making. Numerous studies (see, for example, Isen & Labroo, 2003; Forgas, 1998, 2002; and Kopelman et al., 2006) have demonstrated that individuals behaved more cooperatively and were more willing to use integrative strategies and make and reciprocate deals than were those in a negative mood. Such effects on bargaining behaviour produced significantly better outcomes for those in a positive mood. However, this effect is not unconditional.

Individuals who display negative affect (i.e., anger) can be effective in bargaining and attaining higher gains (Lerner & Tiedens, 2006). Sinaceur and Tiedens (2005) and Van Kleef, De Dreu, Pietroni and Manstead (2006) demonstrated that a strategic display of anger was effective in extracting value in face-to-face bargaining since individuals facing an angry opponent made larger concessions compared to those who faced a happy opponent in order to avoid an impasse, entrapment and the probability of deadlocks. Reasoning, bargaining and assertiveness, however, have significant positive effects on the long-term relationships with others, whereas bargaining is negatively related to interpersonal assessments (Wayne et al., 1997). In this regard, Lerner and Tetlock (1994, p. 3) comment that such individuals are
“hopelessly inept politicians who may try to maintain good working relations with important constituents, but who instead frequently wind up antagonizing them”.

In fact, bargaining may be a form of emotion-focused coping and subsequent cognitive withdrawal (i.e., minimizing attentional effort). For example, Stevens and Gist (1997) demonstrated that individuals’ cognitions account for cognitive withdrawal in analytical task strategies (i.e., hurried through the negotiation and tried to get the negotiation over with quickly). It is thus possible that bargaining is associated with external attributions of control and certainty to deflect blame for poor outcomes to other sources in order to protect individuals from the negative effects of impasses (see, for example, O'Connor & Arnold, 2001, and Sullivan et al., 2003).

Finally, in accordance with the available theorizing and research, rational social influence, independence in decision making and bargaining were also empirically distinct from Factor O (apprehensive, insecure, self-doubting) as an aversively dispositional trait to account for performance (see, for example, Smillie et al., 2006). Unlike affective dispositions which are enduring over time, affective states fluctuate and change (George, 1986) and context-dependent motivational processes (e.g., self-efficacy beliefs) mediate the relation between these dispositional affective traits and performance (Kanfer & Heggestad, 1997).

**Summary and Conclusion**

Psychometrically sound instruments bear importantly on the credibility of all the present study’s findings, and they become even more critical when the indicators are presumed to represent underlying constructs (Byrne, 2001). Given the intention of the instruments to measure the specific defined constructs an exploratory approach was followed to operationalize the latent variables. EFA identified understandable and interpretable parsimonious factor structures associated with each of the latent variables under consideration in keeping with the literature and empirical research. Reliability estimates also confirmed a degree of trust in the measures’ psychometric properties to provide an uncontaminated measure of the defined constructs. A summary of the psychometric properties of the validated and custom-designed measures is provided in Table 5.13.
The data in Table 5.13 suggest that the measures display respectable psychometric properties. The majority of the reliability estimates confirmed a degree of trust in their ability to provide a valid and reliable measure of the defined constructs. For early-stage research with new measures, Nunnally (1978) suggested reliabilities of .7. However, Hair et al. (1998) suggest .60 to be acceptable for exploratory research.

The distributional characteristics of the majority of the measured indicators, however, violated the assumptions of univariate normality and suggested that the distributions might reflect the idiosyncrasies unique to the specific sample. Especially noteworthy were high levels
of leptokurtosis (i.e., highly peaked) for some indicators that is particularly troublesome in this study. Multivariate statistical analyses is sensitive to strong kurtosis (skewness) in the data (see Bentler, 2006, Hair et al., 1998) and this violation of normality might compromise any inferences drawn from parametric statistical analyses though investigation may still be worthwhile according to Cohen, Cohen, West and Aiken (2003).

Unfortunately, in many fields data often are non-normal and the distributions involved are hard to specify. In psychology, for example, Micceri (1989) found that the distributional characteristics of 440 large-sample achievement and psychometric measures were all significantly non-normal at the alpha .01 significance level. Moreover, several classes of contamination were found and Micceri stated that the underlying tenets of normality-assuming statistics appear fallacious for these commonly used types of data. Bentler (2006) also makes the observation that the assumption of underlying normality may be questionable in some contexts. In Table 5.13, for example, the nature of the measured indicators for Immediate Affect, Anticipated Affect, and Fatigue makes normality assumptions unreasonable to expect given the context within which these indicator measures were observed.

The next chapter presents the research and sampling design, data analysis techniques, the data collection, the procedures followed, the ethical considerations, the data analysis and data techniques. The chapter also outlines a description of variables, as well as the substantive and statistical hypotheses which focus and refine the broad aim of the study.
CHAPTER SIX

RESEARCH METHODOLOGY

A testable assumption underlying the present study is that the simultaneous effects of context, managers’ cognitions, multiple goals, distal and proximal individual variable factors and decision-generated affect combine to impact on the volitional allocation of attentional resources in the prediction of individual differences of quality of MDM processes and outcomes. The single and primary aim of the study is to establish the postulated ordering of a causal path linking individual variable factors (distal influences), self-efficacy beliefs (as proximal influences) and temporal processes as a whole, which may bear on the construct of MDM as was illustrated in Figure 2.3 on page 66.

Emanating from this model of MDM, the following sections of this chapter describe the research and sampling design, the procedures followed, the ethical considerations, and the data analysis and data techniques. This is followed by a description of the variables and substantive and statistical hypotheses which further focus and refine the broad aim of the study.

Research Design

The clearest way to classify non-experimental quantitative research is to base such a classification on the major or primary research objective, that is what the researcher is attempting to accomplish in the research study. Johnson (2001) classifies studies into categories of descriptive, explanatory and predictive research. Whether the primary objective is descriptive depends on answers to the following questions: is the research primarily describing a phenomenon, and is the researcher documenting the characteristics of the phenomenon? If the answer is yes (and there is no manipulation) then the term descriptive non-experimental research should be applied.

Further, in order to determine whether the primary objective is explanatory depends on the answers to two questions: one is whether the researcher is developing or testing a theory about a phenomenon in order to explain ‘how’ and ‘why’ it operates. The second question is whether the researcher is trying to explain how the phenomenon operates by identifying the causal factors that produce change in it. If the answer is yes (and there is no manipulation) then the term explanatory non-experimental research should be applied.
To determine whether the primary objective was predictive, one needs to answer the following question: did the researcher conduct the research in order to predict or forecast some event or phenomenon in the future (without regard for cause and effect)? If the answer is yes (and there is no manipulation) then the term predictive non-experimental research should be applied.

It has been pointed out that causality is a logical and experimental matter and not a statistical issue (Tabachnick & Fidell, 2001). Causality requires variables to be related, the existence of temporal antecedence conditions (i.e., changes in latent variable A cause changes in latent variable B), and that observed relationships are not due to confounding extraneous variables (i.e., the lack of an alternative explanation condition or a non-spuriousness condition). Therefore, no other plausible alternative explanation for the observed relationships must exist prior to drawing any causal conclusions.

A cause is a direct effect of a variable on another within the context of a complete model, with its magnitude and direction given by a partial regression coefficient. Consequently, in order to draw a causal conclusion no other plausible alternative explanation for the observed relationship must exist for causality to exist. This is the case when the complete model contains all the relevant influences on a given exogenous variable and causal precursors are correctly specified. In practice, however, models may omit key predictors and may, accordingly, be misspecified so that the model may be inadequate as a ‘causal model’ in a philosophical sense (Byrne, 2001). A theoretical explanation or rationale for the observed relationships is also important in order to make sense of the causal relationship and for the testing of hypotheses with new research data.

Non-experimental research is useful for identifying relationships, but it is weak on time order and temporal antecedence conditions (i.e., for variable A to cause changes in variable B, then A must occur before B). Non-experimental research is especially weak in ruling out alternative explanations because of the problem of spuriousness. As an ex post facto study, the variables of interest in this research are not subject to direct manipulation, as the nature of the setting within which the study takes place does not provide an opportunity to manipulate the variables. Further, as data collection is cross-sectional it cannot rule out cohort effects. Moreover, individuals respond to measures at just one point in time and, given the subjective nature of some of the measures, it is possible that individuals might respond differently at a
different time or context. These are the exact arguments Vancouver et al. (2001) and Vancouver et al. (2002) used to argue that an over-reliance on cross-sectional, correlational designs might mask the complexity of the relation between self-efficacy beliefs and performance. That being said, it is important to acknowledge that experimental methodologies lack the ecological validity (i.e., real-life conditions) afforded by the current research design.

In conclusion, using Johnson’s (2001) framework the present study can be described as an ex post facto explanatory-predictive research study.

Sample

Sampling Design

The available population for this study provided an opportunity for non-probability, purposive sampling in order to collect data. The question of sample size addresses the issue of generalizing findings to the target population of experienced managers. As the main aim of the study is to test a model of relations in MDM, generalization is not the main consideration but the model would have to be explored using various samples before final conclusions can be reached about generalizability. This means that findings need to be tempered with an interpretation of the extent of similar settings to which the findings can be expected to apply.

Population

Sample size has a direct impact on the appropriateness, generalizability and statistical power of the use of multivariate techniques (Hair et al., 1998; Pallant, 2001; Tabachnick & Fidell, 2001). In any study the use of a non-probability sample of the target population requires caution when making generalizations of findings to the target population. It was pointed out earlier that it is difficult to access measurements obtained from experienced managers. A practical and viable option thus was to focus on an available sample of experienced managers. The accessible population from which the present sample of participants was selected consisted 450 of experienced managers in the Western Cape region of South Africa, all employed in private and public organizations. The research setting was a private practice that conducts
assessments of experienced managers with well-developed cognitive abilities and task-specific knowledge.

Defining the Sample

The private practice selects and screens managers (by in-house human resources professionals) for appointment in more senior managerial positions, as well as processing referrals for executive management assessments. This provided an opportunity for a non-probability, purposive sampling to collect data for the present research. The accessible population that is assessed annually in the practice consisted of 73% males, 13% black African, and 50% employed in middle management positions, with 34% in senior positions. The sample drawn from this accessible population is defined in the following subsection.

Describing the sample

This subsection describes the characteristics of the selected sample of managers \((N = 196)\) used in this study. The mean age of the sample was 38.9 years, with a \(SD\) of 7.49 (range 25 to 61 years). Ethnic black managers constituted 15.8% of the selected sample of managers. In terms of gender 30.1% was female and 69.9% male. The levels of education of the selected sample are depicted in Table 6.1. From these analyses the managers in the present sample predominantly represented experienced white male managers, aged around 40 years, with postgraduate education (77%).

Table 6.1 Education Levels of Managers

<table>
<thead>
<tr>
<th>Education Level</th>
<th>(n)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 12</td>
<td>10</td>
<td>5.2</td>
</tr>
<tr>
<td>Diploma</td>
<td>34</td>
<td>17.3</td>
</tr>
<tr>
<td>Graduate</td>
<td>79</td>
<td>40.3</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>73</td>
<td>37.2</td>
</tr>
<tr>
<td>Total</td>
<td>196</td>
<td>100.0</td>
</tr>
</tbody>
</table>
**Representivity with regards to job level**

The job levels occupied by managers in the sample were recorded in order to ascertain what managerial levels they occupied at the time of assessment. Based on the work of Jaques (1996), Prinsloo (1992) developed ‘The Cognitive Task Assessor’ in order to measure level of work according to an adapted version of the Stratified Systems Theory. Individuals were required to distribute a total of six points among the descriptions that they thought applied most to their present position. These points could be distributed among several options, all options or, in extreme instances, a single option. A maximum score of 144 described the most complex job level (level 4), a score of 100 (level 3), a score of 64 (level 2) and a score of 16 described level 1. The description of dimensions and continuum of scores which summatively defined job level and grouped into four dimensions.

**Job dimension 1:** When it comes to management, and/or technical responsibilities at work, I am responsible for: my own productivity (1); supervise the work of others (2); manage via measurement, control, planning, budgeting (3); do general management (4); manage and coordinate various divisions or business units (5); am a senior executive at corporate level or on the board of directors (6).

**Job dimension 2:** I work with, and am directly responsible for: handling objects, like documents (1); diagnoses of symptoms, causes and effects, solving problems (2); managing structures, the input, throughput and output of the division (3); longer term policies and strategies related to business unit structure and function (4); analyses of opportunities and macro-economic factors (e.g. labour, technology) within the national business context (5); and moving quickly on international vulnerabilities and opportunities (6).

**Job dimension 3:** If I were to make a serious mistake at work, or used poor judgment at work, this would directly affect: the quality of the products manufactured, and/or the services provided (1); cycle times, customer satisfaction and productivity (2); divisional profits, general process efficiency of the division (3); organizational growth, market share, the long term goal achievement of the organization, (4); the strategic direction of the organization (5); loss of shareholder value and trust, group / industry reputation, long-term, international sustainability of group (6).

**Job dimension 4:** I am directly responsible for: day-to-day production and service (1); diagnostics and maintenance (2); market segment coverage, pricing, customer satisfaction
divisional structures (3); cost leadership product and market focus (4); national mergers, strategic alliances or divestitures, generating and evaluating broad strategy (5); international resource allocation, representing group interests in international public domain, significant long term investments, the future health of the group (6).

The total mean job dimension score obtained was 71.23 ($SD = 19.5; \ n = 190$). The modal score was 48 and the median was 71. The representation of managers across job dimension is depicted in Table 6.2.

### Table 6.2 Managers Across Job Levels

<table>
<thead>
<tr>
<th>Level</th>
<th>n</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 4</td>
<td>17</td>
<td>8.7</td>
</tr>
<tr>
<td>Level 3</td>
<td>101</td>
<td>51.5</td>
</tr>
<tr>
<td>Level 2</td>
<td>43</td>
<td>21.9</td>
</tr>
<tr>
<td>Level 1</td>
<td>29</td>
<td>14.8</td>
</tr>
<tr>
<td>Incorrect responses</td>
<td>6</td>
<td>3.1</td>
</tr>
<tr>
<td>Total</td>
<td>196</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Most managers (60%) occupied positions (levels 3 and 4) that entailed the management and coordination of divisions or business units at a senior or executive level. Level 3 and 4 job dimensions entail the analyses of opportunities and macro-economic factors within a national business or international context. In addition, these job levels require individuals to set the strategic direction of the organization, with individuals accountable for shareholder value and group/industry reputation, long-term sustainability, investments, and the future health of the business through national mergers, strategic alliances or divestitures.

The sample reflected the expected profile in the Western Cape in that black managers are a minority in terms of the population demographics. In terms of population the highly urbanised Western Cape is home to about 24.7% of the black population with the white and coloured population amounting to 74.5% (Provincial Decision-Making Enabling Project, 2005). The fact that the sample is reflective of experienced managers in industry-specific companies in the Western Cape region of South Africa is however not necessarily generalizable to other geographical areas, economic sectors and countries. Qualitatively different situations or industry characteristics are thus likely to covary and it may be that smaller entrepreneurial or significantly larger enterprises could provide different conclusions. Future research using larger samples within-situations to test the individual and situation interaction effects might aid further modifications and refinements of the model to advance insights into MDM.
Consequently, solutions and generalities (external validity threats) in this specific setting may need to be explored in similar settings (Welman & Kruger, 2001).

Data Collection

The following subsection provides information on how data for the present research was collected.

Procedure

The setting of an assessment practice uses compliant assessment procedures in terms of the Employment Equity Act of South Africa (Act No. 55 of 1998), and the choice of instruments is determined by valid and reliable psychometric properties. This specific practice is also governed by the ethical and best practice guidelines as specified by the South African Society for Industrial Psychology (1998) and the internationally recognised best practice assessment guidelines published by the International Test Commission (2000). A registered industrial psychologist met with each nominated assessment candidate to explain the purpose of assessment and to clarify expectations. The full-day process started with biographical data collection, followed by a structured interview of approximately 45 minutes.

The data collection for this research was incorporated into the standard assessment procedures that the practice employs. Candidates thus participated in the research voluntarily and with informed consent. In the present study, the researcher formalized the variables on an \textit{a priori} basis prior to actual measurement, and the collection of data followed in a temporal order. The exogenous variables (cognitive ability and social self-confidence) were measured first, followed by the measurement of the endogenous variables (starting with self-efficacy beliefs). Measured in close temporal proximity, self-efficacy beliefs as a prospective measure and the self-description of experienced affect as a retrospective measure were integrated with the simulations and personality traits measures, in order to assess individuals’ subjective context-specific appraisals of their competence and reactions over a brief rating period. The temporal order of measures were: cognitive abilities followed by self-efficacy beliefs and personality measures. The simulations followed thereafter. This temporal order of data collection followed Bandura’s (1997, p. 67) assertion that the contribution of self-efficacy
beliefs and subsequent behaviour is revealed most accurately when they are measured in close temporal proximity, since the strength of self-efficacy beliefs is likely to “waver as the time of performance draws near”.

The measurement of individuals’ systematic-comprehensive decision process was completed first after an appropriate briefing and instructions. This was followed by a 30-minute role-play simulation with a registered industrial psychologist. One observer, trained in the role-play observation scale, was responsible for taking notes and scoring. On completion of the simulations a self-descriptive measure to index the phenomenological experiences of decision-generated affect was administered. The results of all measures were processed and downloaded onto a database from which relevant data for the purposes of this research were extracted. It must be noted that this data collection differed from the standard managerial assessment in that it included additional measures on self-efficacy beliefs, decisional procrastination, and the measurement of phenomenological experiences of decision-generated affect and fatigue.

**Ethical Considerations**

The decision to undertake the present research rested on a considered judgment about how best to contribute to psychological science and human welfare. The research proposal was submitted to the Human Ethics Committee of the Nelson Mandela Metropolitan University for approval. On the basis of this consideration, the researcher carried out the investigation with respect and concern for the dignity and welfare of the individuals who participated, taking cognizance of statutory and professional standards that govern the conduct of research with human participants.

The researcher provided information to each individual to help them understand the study, as well as to inform them as to what they would be asked to respond to during the assessment, the risks and benefits, and their rights as study subjects. It was pointed out that the research has been approved by the Human Ethics Committee of the Nelson Mandela Metropolitan University. It was also pointed out that some of the measures to be used during the managerial assessment will be clearly marked “for research purposes only”. Assurance was given in this regard that the findings would not be used for the purposes of the assessment they had been nominated for. Moreover, each individual was informed that participation in the
research was completely voluntary and should they wish not to participate, they would incur no consequence to which they might be entitled. Assurance was also given that they would remain anonymous. Following this briefing by the researcher a written informed consent to participate was obtained [See Appendix I and II for an example of consent documentation].

Other than the managerial assessment findings, the information collected for the purposes of this study was shared with participants who requested such information in a verbal feedback session with the researcher. Furthermore, due to the provisional nature of the study, findings collected for the purposes of the study were not disclosed to the source of referral as part of the assessment findings.

**Data Analysis and Techniques**

The choice of data analysis techniques is dependent on the type of research questions posed by the present study. This necessitated the use of multivariate analysis techniques to deal with multiple relationships of dependent and independent variables that are interrelated in such a way that their different effects cannot meaningfully be interpreted separately. Statistical techniques that accommodate multiple dependent variables (e.g., multivariate analysis of variance and canonical correlation) are thus not applicable in this situation because they allow for only a single relationship between dependent and independent variables (Cohen et al., 2003; Hair et al., 1998; Hair et al., 2006). The following subsection elaborates on the data analysis techniques that were employed to test the propositions.

*Structural Equation Modeling (SEM)*

The use of SEM sets it apart from the older generation of multivariate procedures. By demanding that the pattern of intervariable relations be specified *a priori*, SEM lends itself well to the analysis of data for inferential purposes in contrast to most other multivariate procedures. Traditional multivariate procedures (e.g., those rooted in regression or general linear models) are incapable of either assessing or correcting for measurement error, whereas SEM provides explicit estimates of these error variance parameters. Traditional methods assume that error(s) in the explanatory (i.e., independent) variables disappears. However, this in fact ignores error
which may lead ultimately to serious inaccuracies, especially when errors are sizeable (Byrne, 2001).

Furthermore, SEM is suitable for testing the entire system of direct and mediated relations in the causal structure, not just the contribution of isolated predictors (Hayashi, Bentler, & Yuan, 2008). In a study that compared regression to SEM methodologies in terms of superiority in identifying mediation structures, Iacobucci, Saldanha and Deng (2007) reported an advantage of SEM over regression due to the fact that the standard errors in the SEM approach were reduced because of the simultaneous estimation of all parameters in the SEM model. Iacobucci, Saldanha and Deng (2007, p. 145) comment:

Fitting components of models simultaneously is always statistically superior to doing so in a piece-meal fashion… The SEM results work to the researcher’s benefit, in being more likely to detect existing patterns of mediation, being truer to the known population structural characteristics, and finally in also being statistically more defensible, given the elegance of the simultaneous estimation.

Consequently, even with the simplest of data sets SEM is seen to be the superior data analysis strategy. Structural equation modeling (SEM) is commonly used (see, for example, MacCallum & Austin, 2000) and a significant number of the studies reviewed in Chapter Three used this analysis technique. Furthermore, Viswesvaran and Ones (1995, p. 881) note that “structural equations modeling facilitates building theories of work behaviour that capture the richness and complexity of real world phenomena, a richness and complexity uncapturable in individual studies”. Moreover, SEM is valuable in estimating the unique contribution of self-efficacy beliefs to subsequent performance after controlling for a host of other possible determinants (Bandura, 1997). The presence of multiple relationships of dependent and independent variables implies that SEM can estimate the unique contribution of self-efficacy beliefs to the prediction of the quality of MDM processes after controlling for distal individual variable factors. SEM can, thus, evaluate the patterns of influences as a whole in the proposed model and disentangle the unique contribution of self-beliefs within the posited relations (Bandura & Locke, 2003). Based on this assertion, the researcher adopted SEM as the data
analysis strategy of choice. The statistical package that is used in the analysis was EQS 6.1 (Bentler, 2006) and AMOS 17.0 for Windows (Arbuckle, 2008).

Structural and Measurement Model

The true value of SEM arises from the benefits of using the structural and measurement models simultaneously, each playing distinct roles in the overall analysis. The structural model of relations as illustrated in Figure 2.3 is decomposed into two basic components: the measurement and the structural models. The measurement model defines relations between the latent variables (i.e., unobserved constructs) and their respective indicators that provide the link between measurements and the underlying constructs they are designed to measure. The measurement model is used to assess the contribution of each indicator measure as well as its reliability in the estimation of the relationships between the exogenous and endogenous variables. Thus it represents a confirmatory factor analysis (CFA) model that specifies the pattern by which each measure loads on a particular exogenous or endogenous variable.

In contrast, the structural model is the ‘path’ model which defines the relations between the exogenous (independent) and endogenous (dependent) variables. Accordingly, it specifies the manner by which particular variables directly or indirectly influence (i.e., cause) changes in the values of other variables in the model.

In the next subsection the primary latent variables and their measured indicators are presented followed by a discussion of the measurement model.

Primary Latent Variables and Measured Indicators

The proposed structural model as depicted in Figure 2.3 contains six constructs deliberately created to represent a collection of concrete forms of behaviour relevant to MDM. As abstract phenomena these constructs represent latent variables (unobserved) that must operationally be defined in terms of behaviour believed to represent it. As such, the latent variables are linked to the direct measurement of an observed variable, albeit the indirect measurement of an unobserved variable (i.e., the underlying construct). Table 5.1 identified these latent variables as exogenous (independent variables) and endogenous variables (independent variables).
The standard LISREL notations were used to identify the latent variables and measurement indicators (see, for example, Diamantopoulos & Siguaw, 2000; Jöreskog & Sörbom, 2003). The exogenous variables (i.e., cognitive ability and social self-confidence) are represented by $\xi$ (ksi’s) with their indicators represented by X’s. The endogenous variables (i.e., self-efficacy beliefs, decision-generated affect, allocation of attentional resources and the quality of MDM processes and outcomes) are represented by $\eta$ (eta’s) with their indicators represented by Y’s. Table 6.3 lists the latent variables and their measurement indicators.

<table>
<thead>
<tr>
<th>Exogenous variables</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\xi_i; i = 1, 2$</td>
<td>$X_j; j = 1, \ldots, 4$</td>
</tr>
<tr>
<td>Cognitive ability</td>
<td>Verbal ability</td>
</tr>
<tr>
<td>Social self-confidence</td>
<td>Numerical ability</td>
</tr>
<tr>
<td></td>
<td>Assertion</td>
</tr>
<tr>
<td></td>
<td>Social boldness</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Endogenous variables</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\eta_i; i = 1, \ldots, 4$</td>
<td>$Y_j; j = 1, \ldots, 14$</td>
</tr>
<tr>
<td>Self-efficacy beliefs</td>
<td>Social influence efficacy</td>
</tr>
<tr>
<td></td>
<td>Exploratory search and processing efficacy</td>
</tr>
<tr>
<td></td>
<td>Thought and affect control efficacy</td>
</tr>
<tr>
<td></td>
<td>Risk tolerance efficacy</td>
</tr>
<tr>
<td></td>
<td>Analytical and inferential efficacy</td>
</tr>
<tr>
<td>Decision-generated affect</td>
<td>Anticipated affect</td>
</tr>
<tr>
<td></td>
<td>Immediate affect</td>
</tr>
<tr>
<td>Allocation of attentional resources</td>
<td>Fatigue</td>
</tr>
<tr>
<td></td>
<td>Decisional procrastination</td>
</tr>
<tr>
<td>MDM processes &amp; outcomes</td>
<td>Procedural rationality</td>
</tr>
<tr>
<td></td>
<td>Decision quality</td>
</tr>
<tr>
<td></td>
<td>Rational social influence</td>
</tr>
<tr>
<td></td>
<td>Bargaining</td>
</tr>
<tr>
<td></td>
<td>Independence</td>
</tr>
</tbody>
</table>

The next subsection presents the measurement model in greater detail.
The measurement model

The measurement model specifies the correspondence of indicators to the exogenous and endogenous variables. Diamantopoulos and Siguaw (2000, p. 89) state:

> Clearly, unless we can trust the quality of our measures, then any assessment of the substantive relations of interest (i.e., the links among the latent variables themselves) will be problematic. Thus an evaluation of the measurement part of the model should precede the detailed evaluation of the structural part of the model.

To specify the measurement model, a confirmatory approach is adopted. Based on both conceptual and empirical grounds, the present researcher used and selected multiple indicator measures and linked these to their appropriate exogenous and endogenous variables on an a priori basis. There is no upper limit for the number of indicators for a variable, though as a general rule it is important to work with fewer indicators in relation to sample size according to Tabachnick and Fidell (2001). Cognitive ability is represented by two indicator variables, social self-confidence by two, self-efficacy beliefs by five, decision-generated affect by two, the allocation of attentional resources by two and the quality of MDM processes and outcomes are represented by five measured indicators.

The second step involves a confirmatory factor analysis (CFA) to verify the psychometric quality of the measurement model and the magnitude of the relations between latent variables. Error associated with measured indicators also represents measurement error, which reflects on the indicators’ adequacy in measuring the related variables. In this regard, SEM takes a confirmatory, rather than an exploratory, approach to the data analysis and thus sets it apart from the older generation of multivariate procedures since these techniques assume that error(s) in the explanatory (i.e., independent) variables vanishes. Thus, applying those methods when there is error and ignoring error may lead, ultimately, to serious inaccuracies (Byrne, 2006). SEM provides explicit estimates of these error variance parameters. Error associated with exogenous and endogenous variables represents measurement error that reflects on the adequacy of measured indicators in measuring the related variable underlying factors. Measurement errors for indicators of exogenous variables are denoted by delta (δ) and for indicators of endogenous variables as epsilon (ε). In fact, Byrne (2001) asserts that it is worth
noting that both measurement and structural error terms, in essence, represent unobserved variables.

The measurement model thus not only provides reliability data but also establishes the independence of the variables in the proposed model. Once it is known that the measurement model is operating adequately, it provides for confidence in findings related to the assessment in order to determine the adequacy of its goodness of fit to the sample data. The hypothesized CFA model appears in Figure 6.1.

![Figure 6.1 Hypothesized CFA Model](image)

**Composite reliability**

Beyond the examination of the loadings for each indicator, a principal measure used to assess the measurement model is the composite reliability of each variable. Reliability as a
measure of the internal consistency of the latent variable indicators depicts the degree to which they ‘indicate’ the variables under consideration. More reliable measures provide greater confidence that the individual indicators are all consistent in their measurements. A commonly used threshold value for acceptable reliability is .70, but values below this are deemed acceptable if the research is exploratory in nature (Hair et al., 1998).

The reliability and variance extracted for the variables were computed separately for each multiple indicator variable in the model and should exceed .50 (i.e., approximately correspond to a standardized loading of .70). Diamantopoulos and Siguaw (2000, p. 90) suggest the following to calculate composite reliability values:

\[
\rho_c = \frac{(\sum \lambda)^2}{(\sum \lambda)^2 + \sum \theta}
\]

where: \(\rho_c\) = composite reliability; \(\lambda\) = completely standardized indicator loadings; \(\theta\) = completely standardized indicator error variances (i.e. variances of the \(\delta\)’s and \(\varepsilon\)’s); and \(\Sigma\) = summation over the indicators of the latent variable.

A satisfactory composite reliability greater than .60 is accepted to indicate that the composite indicators are linked to a given variable. Hair et al. (1998) also suggest variance extracted (\(\rho_v\)) as another measure of reliability. This measure indicates the amount of variance ascribed to the variable in relation to the amount of variance due to measurement error. Consequently, it reflects the overall amount of variance in the indicators accounted for by the variable. Higher variance extracted values occur when the indicators are truly representative of the latent variable (\(\rho_v\) values less than .05 indicate that the measurement error accounts for a greater amount of variance in the indicators than the underlying variable does). If this is indeed the case, then serious doubts arise regarding the soundness of the indicators and/or the variable itself.

Variance extracted is calculated according to Diamantopoulos and Siguaw (2000) as:

\[
p_v = \frac{(\sum \lambda)^2}{(\sum \lambda)^2 + \sum \theta}
\]

where: \(\lambda\) = completely standardized indicator loadings; \(\theta\) = completely standardized indicator error variances (i.e. variances of the \(\delta\)’s and \(\varepsilon\)’s); and \(\Sigma\) = summation over the indicators of the latent variable.

In contrast to the measurement model, the structural model represents the linear relationships among measured indicators and the exogenous (independent) to endogenous
(dependent) variables with the smallest number of causal paths. The next subsection introduces the structural model.

*The Structural Model*

Based on the theoretical assertion and empirical research the structural model allows for the specification of the regression structure among the indicators and, accordingly, specifies the manner by which the proposed exogenous and endogenous variables directly or indirectly (mediate) influence or ‘cause’ changes in the values of the subsequent variables in the model. Hair et al. (1998) assert that causal relationships can take many forms and meanings, from strict causation to the less well-defined relationships encountered in behavioural research, such as the ‘causes’ or the ‘reasons’ of performance.

A researcher can assume causation between two variables in the theoretical justification provided to support such analyses. Causal assertions can thus only be made that are based on: a sufficient association between the two variables; the existence of a temporal antecedence of the cause versus the effect; a lack of alternative causal variables; and a theoretical basis for the relationships. Accordingly, “although in many instances all of the established criteria for making causal assertions are not strictly met, causal assertions can possibly be made if the relationships are based on a theoretical rationale” (Hair et al., 1998, p. 592-593).

In order to determine the goodness of fit between the hypothesized model and the sample data, structure is imposed on the sample data to test how well the observed data fits the restricted and specified causal relationships of the proposed structural model. Failure of the model to fit the data results in model falsification, whereas a good fit supports the theoretical arguments that the model is, at least, one model that provides adequate goodness-of-fit to the sample data. The full structural model of relations together with indicators is depicted in Figure 6.2.
Figure 6.2 The Structural and Measurement Model of MDM

Where: Verbal ability (X₁); Numerical ability (X₂); Assertion (X₃); Social boldness (X₄); Social influence efficacy (Y₁); Exploratory search and processing efficacy (Y₂); Thought and affect control efficacy (Y₃); Risk tolerance efficacy (Y₄); Analytical and inferential efficacy (Y₅); Anticipated affect (Y₆); Immediate affect (Y₇); Fatigue (Y₈); Decisional procrastination (Y₉); Procedural rationality (Y₁₀); Decision quality (Y₁₁); Rational social influence (Y₁₂); Bargaining (Y₁₃); Independence (Y₁₄)
The arrows in the model represent specific relationships between variables with a straight arrow indicating a direct causal relationship from one variable to another and curved arrows (between cognitive ability and self-efficacy beliefs, social self-confidence and self-efficacy beliefs) indicating that two variables covary. It was pointed out earlier that MDM is embedded in a rich nomological network that contains many antecedent and/or consequential latent variables. The most critical error in developing theoretically based models is the omission of one or more key variables, a problem known as specification error (Hair, Anderson, Tatham, & Black, 1998). The fact that the selection of latent variables is made on an *a priori* basis represents error in the prediction of endogenous factors from exogenous latent variables and is depicted by zeta ($\zeta$). The relationship between the variables and their indicators is captured by lambda ($\gamma$). Measurement errors for indicators of exogenous variables are denoted by delta ($\delta$) and for indicators of endogenous variables as epsilon ($\epsilon$). The non-directional (covariance) relationship between the two exogenous variables (i.e., cognitive ability and social self-confidence) is depicted by a curved line with *double arrows* and designated by $\phi$ (phi). The regression effect of $\xi$’s on $\eta$’s is represented by $\gamma$ (gamma) and the regression effect of $\eta$’s on $\eta$’s by $\beta$ (beta).

**Model Identification**

A model is identified if it is possible to obtain a unique solution for every parameter. An over-identified model is the goal for all structural models since this suggests the existence of more information in the data matrix than the number of parameters to be estimated (i.e., a positive number of degrees of freedom). This is desirable since an overidentified model offers the opportunity to use one set of estimates to test the model. Degrees of freedom represent the number of sources of information available to estimate the sampling distribution of the data after all model parameters have been estimated. The goal in fitting the model is to maximize the degrees of freedom.

The number of degrees of freedom as proposed by Hair et al. (1998) was calculated as:

$$df = \frac{1}{2}[(p + q)(p + q + 1)] - t;$$
where; \( t \) = number of parameters to be identified, i.e., number of estimated coefficients in the proposed model (free parameters); and \( s = p \) (the number of endogenous indicators) + \( q \) (the number of exogenous indicators) calculated as \((p + q)/(p + q + 1)\).

A model is overidentified if \( t < s/2 \) and this is desirable. Furthermore, the number of parameters to be estimated should also be smaller than the sample size (i.e., \( t < n \)).

It is also important to investigate the statistical power associated with testing the model. Unfortunately, this issue is more often than not neglected, but it is important to understand that any model evaluation would be incomplete if power considerations were ignored. Statistical power refers to the probability of rejecting an incorrect model and Diamantopoulos and Siguaw (2000, p. 93) explain this as follows;

When we test a model’s fit by, say, the chi-square test, we emphasize the probability of making a **Type I error**, i.e. rejecting a correct model; this probability is captured by the **significance level**, \( \alpha \) which is usually set at 0.05. A significant chi-square result indicates that *if* the null hypothesis is true (i.e. the model is correct in the population), then the probability of incorrectly rejecting it is low (i.e. less than five times out of 100 if \( \alpha = 0.05 \)). However, another error that can occur is **not** to reject an incorrect model. This type of error is known as **Type II error** and the probability associated with it is denoted as \( \beta \). The probability of avoiding a Type II error is, therefore, \( 1-\beta \) and it is this probability that indicates the power of our test; thus the power of the test tells us how likely it is that a false null hypothesis (i.e. incorrect model) will be rejected.

The importance of conducting a power analysis stems from the critical role that sample size plays in the decisions made in model testing. In large samples the decision to reject a null hypothesis of exact fit (or a null hypothesis of close fit) becomes problematic because it is not clear whether the model was rejected because of severe misspecifications in the model or to the (too) high sensitivity of the test to detect even minor flaws in the model. Conversely, in small samples the decision not to reject the null hypothesis of exact/close fit results in ambiguity because it is not clear whether the decision was due to the accuracy of the model or to the insensitivity of the test to detect specification errors in the model.
The present researcher used two types of power calculations. First, the power associated with a test of exact fit [i.e. testing the null hypothesis that the model fits perfectly in the population (as done by the conventional model fit test)], taking into account that this may only be an approximation of reality and thus rarely fits exactly in the population. In addition, the researcher applied power associated with a test of close fit. In this instance, the null hypothesis states that the model has a close but imperfect fit in the population and takes the error of approximation into account and is, therefore, more realistic. The power of the test, however, becomes a function of the degrees of freedom in the model and all other things being equal, the higher the degrees of freedom, the greater the power of the test (Diamantopoulos & Siguaw, 2000).

Power tables compiled by MacCallum et al. (1996) make provision for degrees of freedom ≤ 100 and N ≤ 500. The researcher used a SPSS translation of the SAS syntax provided by MacCallum et al. (1996) in order to derive power estimates for the tests of exact and close fit, with a significance level (α) of 0.05 and a sample size of 196.

Model Size

In addition to its role in determining statistical power, sample size also affects the generalizability of the results through the ratio of measured indicators to variables. A low ratio runs the risk of ‘overfitting’ to the sample, making the results too specific to the sample and, consequently, lacking external validity (i.e., generalizability). A rule of thumb is to have at least 10 observations per indicator (Savalei & Bentler, 2006). The proposed model employs 14 indicators. The sample size of 196 thus met the requirement of 10 observations per indicator. Hair et al. (1998), however, recommend that when the data violate the assumptions of multivariate normality, the ratio of respondents to parameters needs to increase with a generally accepted ratio of 15 respondents for each parameter (210 in the case of the present study). Further, these authors recommend a sample size of 200 as being the ‘critical sample size’. A sample size of about 200 is adequate for small to medium models (Ullman, 1998). The sample of 196, accordingly, was regarded as a reasonably adequate sample size for the purposes of the present study.
Input Matrix

Other than the sample size that is required to meet research objectives the researcher was fortunate enough to have no missing data. In order to address the estimation of the specified model, a correlation matrix was used as input data because the objective in the present study was the exploration of a pattern of interrelationships/correlations. Use of correlations is appropriate when the objective of the research is to understand the pattern of relationships. Furthermore, correlations among the latent variables aid in nomological validity (Hair et al. 2006). Research has shown that the correlation matrix provides a more conservative estimate of the significance of coefficients. However, results should be interpreted cautiously since they may not be generalizable to different situations (Hair et al., 1998).

In conclusion, the proposed structural model met the necessary conditions that provided confidence to proceed with the analysis. The theoretical model with the path diagram was specified in more formal terms through a series of equations that defined: the measurement model specifying which indicators measured which variables; the structural equations linking the variables; and a set of matrices to indicate the hypothesized correlations among variables. Each type of equation or matrix is outlined in the next section.

Estimation Procedure

Given in practice that most data fail to meet the assumption of multivariate normality (Bentler, 2006), this makes SEM sensitive to the distributional characteristics of the data, particularly the departure from multivariate normality or a strong kurtosis in the data (Byrne, 1998, 2006; Hair et al., 1998; Hair et al., 2006). The standard, and most widely researched, method of estimation used in SEM is Maximum Likelihood (ML). ML has been found to provide valid results for sample sizes between 100 to 150. This is a very robust estimation method that functions well under less-than-perfect conditions (i.e. non-normality) (Hair et al., 2006). Despite the restrictive normality assumption the ML parameter estimates are actually fairly robust to the violation of this assumption and, ML is thus the preferred method of estimation even if this assumption is violated. The standard errors for parameter estimates as well as the model fit are, however, affected by non-normality (see Bentler, 2006; Savalei & Bentler, 2006). The potential sensitivity of ML to non-normality, however, raised a need for an
alternative estimation approach. Given the rejection of the null hypothesis of multivariate normality, robust maximum likelihood (RML) to fit the measurement and structural models (see Bentler, 2006) was employed. In the sample of 196 managers there was no missing data.

**Model Evaluation**

A wide range of goodness-or-fit indices are available that can be used as summary measures of a model's overall fit. Unfortunately, none of them is unequivocally superior to the rest in all circumstances, because particular indices have been shown to operate somewhat differently given sample size, estimation procedure, model complexity, violation of the underlying assumptions of multivariate normality and variable independence, or any combination thereof (see, for example, Bentler, 2006; Bentler & Yuan, 1999; Byrne, 2006; MacCallum & Austin, 2000; McDonald & Ho, 2002; McIntosh, 2007; Savalei & Bentler, 2006; Tomarken & Waller, 2005).

The researcher evaluated the goodness-of-fit for the measurement model and the specific evidence of construct validity using AMOS 17.0 for Windows (Arbuckle, 2008) and EQS (Bentler, 2006). Tabachnick and Fidell (2001) recommend EQS as the data analysis program of choice when data are non-normal. It is also the only program that offers the Satorra-Bentler scaled $\chi^2$ and residual-based tests (Yuan-Bentler Residual-Based Test Statistic and the Yuan-Bentler Residual-Based F-Statistic) as the most accurate methods for dealing with non-normal data.

The next subsection presents the fit statistics employed in the present study.

**Absolute Fit Statistics**

The following absolute fit statistics, the Satorra-Bentler Scaled Chi-square, (SB-$\chi^2$), the Yuan-Bentler Residual-Based Test Statistic, the Yuan-Bentler Residual-Based F-Statistic, and the Root Mean Square Error of Approximation (RMSEA), were used. These absolute fit indices are direct measures of how well the proposed model as specified reproduces the observed data. As such, they provide the most basic assessment of how well the model and theory fits the sample data. The SB-$\chi^2$ scaled test and the Yuan-Bentler residual based and F-tests are presently the most reliable test statistics under distributional violation (Bentler, 2006).
A nonsignificant $\chi^2$ is desired to develop a model that fits the data. The null hypothesis ($H_0$) postulates that specification of the factor loadings, factor variances/covariances, and error variances for the MDM model are valid and $\chi^2$ tests the extent to which this specification is true. The probability value associated with $\chi^2$ represents the likelihood of obtaining a $\chi^2$ value that exceeds the $\chi^2$ value when $H_0$ is true. Thus, the higher the probability associated with $\chi^2$, the closer is the fit between the hypothesized model under $H_0$ and the perfect fit (Byrne, 2001). However, it is not very practical to assume that data must fit the proposed model perfectly since any model is an approximation of reality. Moreover, $\chi^2$ is influenced by sample size, that is, as the sample increases so does the value of $\chi^2$. In addition, $\chi^2$ is also influenced by model complexity. As the number of indicators (observed variables) increase (i.e., making the model more complex), so does $\chi^2$. In order to address these negative consequences of $\chi^2$, other fit indices are used to compliment the evaluation of model fit.

Byrne (2001) notes that the RMSEA has only recently been recognized as one of the most informative criteria in covariance structure modeling. The RMSEA takes into account the error of approximation in the population and asks the question of how well the model, with unknown but optimally chosen parameter values, fits the population covariance matrix if it were available. This discrepancy, as measured by RMSEA, is expressed per degree of freedom and makes the index sensitive to the number of estimated parameters in the model (i.e., the complexity of the model). Zero values are desired where values < .05 indicate a good fit and values as high as .08 represent reasonable errors of approximation in the population. The routine use of the RMSEA is argued for at least three reasons: it is adequately sensitive to model misspecification; it yields appropriate conclusions regarding model quality; and it is possible to build confidence intervals around RMSEA values (Bentler, 2006).

Some authors note that RMSEA values ranging from .08 to .10 indicate mediocre fit, and those greater than .10 indicate poor fit. Bentler (2006) and Byrne (2001) note that the use of confidence intervals is valuable in order to assess the precision of RMSEA estimates since it can provide assistance in the evaluation of model fit. Presented with a small RMSEA but a wide confidence interval, it is possible to conclude that the estimated discrepancy value is quite imprecise, thereby negating any possibility of accurately determining the degree of fit in the population. In contrast, a narrow confidence interval argues for good precision of the RMSEA value in reflecting model fit in the population. EQS (Bentler, 2006) generates a report to
indicate a 90% interval around the RMSEA value. In contrast to point estimates of model fit (which do not reflect the imprecision of the estimate), confidence intervals can yield more information, thereby providing more assistance in the evaluation of model fit.

*Standardized Root Mean Square Residual (SRMR)*

The difference between the observed covariance matrix (derived from the observed data) and the estimated covariance matrix (derived from the theoretical model) is known as a residual. Thus, the error in prediction for each covariance term creates a residual. By squaring these residuals and obtaining their average residual it is possible to determine the square root of these mean residuals resulting in the root mean square residual (RMSR). The standardized root mean residual (SRMR) is thus an alternative fit index that can be used to compare different models with each other. The SRMR is known as a badness-of-fit measures with higher values being indicative of poor model fit. An arbitrary cut-off of between .05 and .08 is suggested for SRMR (Byrne, 1998).

*Incremental and Parsimony Fit Statistics*

Indices of comparative fit that use as a baseline an independence or null model, contrast the ability of the model to reproduce the observed covariance matrix with that of a model known a priori to fit the data poorly, namely one that postulates no paths between the variables in the model. Bentler-Bonett Normed Fit Index (NFI) is one of the classic fit indices. It ranges between 0 and 1 and a model with perfect fit would produce an NFI of 1. A value >.90 was originally considered representative of a well-fitting model and a revised cutoff value close to .95 has recently been suggested. Bentler (2006), however, notes that NFI is affected by sample size and may not reach higher values even when the model is correct.

Parsimonious fit measures adjust the measures of fit to provide a comparison between models with differing numbers of estimated coefficients, the purpose being to determine the amount of fit achieved by each estimated coefficient. More complex models are expected to fit the data better, so fit measures must be relative to model complexity before comparisons between models can be made. Like other fit indices, relatively high values represent relatively better fit to compare one model to another. The present researcher used the following
combination to conclude satisfactory measurement model fit. The NFI has been revised to take sample size into account and, consequently, the Comparative Fit Index (CFI) is a better fit measure of model complexity.

The expected cross validation index (ECVI) focuses on overall error and assesses whether a model is likely to cross-validate across samples of the same size from the same population. This value is not informative in itself as there is no appropriate range of values for the ECVI coefficient. In order to assess a model's ECVI, it needs to be compared against the ECVI values of other models and the model with the smallest ECVI value is then chosen as representing the greatest potential for replication (Byrne, 1998; Diamantopoulos & Siguaw, 2000). Other models used for comparison purposes include the independence model, that is a model of complete independence among all variables (i.e. all observed variables are uncorrelated) as the most restricted model. The saturated model, on the other hand, is a vacuous model in the sense that it is guaranteed to fit any set of data perfect when no constraints are placed on the population moments.

Finally, various authors conclude that satisfactory model fit is indicated by CFI values no smaller than .90, RMSEA values no higher than .08, and SRMR values no higher than .10 (see, for example, Hair et al., 2006).

Model Modification

Statistical hypothesis testing can be a poor tool for choosing a model (Arbuckle, 2008). A model can be useful without being true and rejection of a model on purely statistical grounds (particularly with a large sample) is not necessarily a condemnation. Although the wide range of fit indices provides for a good sense of how well the model fits the empirical data, fit indexes alone cannot envelop all that needs to be known about a model in order to judge its adequacy. In fact, scientific progress could be impeded if fit coefficients (even appropriate ones) are used as the primary criterion for judging the adequacy of a model (Byrne, 2001). Byrne also states that an exclusive reliance on goodness-of-fit indices provides no guarantee that a model is useful and it is entirely possible for a model to fit well and yet be incorrectly specified. As fit indices yield only information on a model’s lack of fit, they do not reflect the extent to which a model is plausible, since the researcher makes this judgment. Thus, any
assessment of model adequacy must be based on multiple criteria that take into account theoretical, statistical, as well as practical considerations.

*Post Hoc Analyses*

Model modification indices are aimed at answering the question as to whether any of the fixed parameters, when freed in the model, would significantly improve the parsimonious fit of the model. Undoubtedly, post hoc model fitting in the analysis of covariance structures is problematic. With multiple model specifications, there is the risk of capitalizing on chance factors because model modification may be driven by characteristics of the particular sample on which the model was tested (e.g., sample size, sample heterogeneity) (see, for example, Byrne, 2001). Further, with multiple model specifications, there is increased risk of making either a Type I or Type II error. Hair et al. (1998), in this regard, state that such modifications need to be done with utmost care and only after deliberate, clear and convincing theoretical justification. Savalei and Bentler (2006, p. 346) are of the opinion that there is nothing wrong with trying to find a set of relationships that explains observed covariances: “After all, data can be expensive to obtain, and throwing them out without fully discovering what they have to say is not the wisest thing to do”. One approach to addressing the problems associated with post hoc model fitting is to employ a cross-validation strategy whereby the final model derived from the post hoc analyses is tested on a second (or more) independent sample(s) (i.e., estimated on a separate set of data) before the modified model can be accepted (see, for example, Bentler, 2006; Hair et al., 1998; Savalei & Bentler, 2006; Tabachnick & Fidell, 2001; Ullman, 1998).

The present study was approached in order to evaluate the causal relations in MDM and not only to improve model fit. It was thus realistic to recognize the obvious impracticality in the termination of all subsequent model analyses. Hypothesized models represent only approximations of reality and thus cannot be expected to fit real-world phenomena exactly as it is. Thus, in the interest of future research, it is justified to explore in depth the question of why a model is not fitting in order to aid insights into the multiplicity of antecedents and consequences in MDM.

The present researcher also formulated additional research hypotheses in order to explore the direct and independent and combined contributions of individual variable factors and self-efficacy beliefs to the prediction of the quality of MDM processes. The first segment
of the posited model specifies the independent functional relations of cognitive ability ($\xi_1$), social self-confidence ($\xi_2$) and self-efficacy beliefs ($\eta_1$) on decision-generated affect ($\eta_2$).

**Exogenous and Endogenous Measurement Model**

The measurement model (depicted in Figure 6.1) can be expressed in terms of the following set of measurement equations. The loadings ($\lambda X_j$) of the observed $X_j$ variables on the exogenous variables ($\xi_i$), are expressed as $X = \Lambda X + \delta$, and the loadings ($\lambda Y_j$) of the observed $Y_j$ variables on the endogenous latent variables ($\eta_i$) are expressed as $Y = \Lambda y + \varepsilon$. These measurement model equations are listed in Table 6.4.

**Table 6.4 Measurement Model Equations**

<table>
<thead>
<tr>
<th>Exogenous indicators</th>
<th>Exogenous variables</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X_1$</td>
<td>$= \lambda X_{1,1} \xi_1$</td>
<td>$+ \delta_1$</td>
</tr>
<tr>
<td>$X_2$</td>
<td>$= \lambda X_{2,1} \xi_1$</td>
<td>$+ \delta_2$</td>
</tr>
<tr>
<td>$X_3$</td>
<td>$= \lambda X_{3,2} \xi_2$</td>
<td>$+ \delta_8$</td>
</tr>
<tr>
<td>$X_4$</td>
<td>$= \lambda X_{4,2} \xi_2$</td>
<td>$+ \delta_9$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Endogenous indicators</th>
<th>Exogenous variables</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>$Y_1$</td>
<td>$= \lambda Y_{1,1} \eta_1$</td>
<td>$+ \delta_3$</td>
</tr>
<tr>
<td>$Y_2$</td>
<td>$= \lambda Y_{2,1} \eta_1$</td>
<td>$+ \delta_4$</td>
</tr>
<tr>
<td>$Y_3$</td>
<td>$= \lambda Y_{3,1} \eta_1$</td>
<td>$+ \delta_5$</td>
</tr>
<tr>
<td>$Y_4$</td>
<td>$= \lambda Y_{4,1} \eta_1$</td>
<td>$+ \delta_6$</td>
</tr>
<tr>
<td>$Y_5$</td>
<td>$= \lambda Y_{5,1} \eta_1$</td>
<td>$+ \delta_7$</td>
</tr>
<tr>
<td>$Y_6$</td>
<td>$= \lambda Y_{6,2} \eta_2$</td>
<td>$+ \varepsilon_1$</td>
</tr>
<tr>
<td>$Y_7$</td>
<td>$= \lambda Y_{7,2} \eta_2$</td>
<td>$+ \varepsilon_2$</td>
</tr>
<tr>
<td>$Y_8$</td>
<td>$= \lambda Y_{8,3} \eta_3$</td>
<td>$+ \varepsilon_3$</td>
</tr>
<tr>
<td>$Y_9$</td>
<td>$= \lambda Y_{9,3} \eta_3$</td>
<td>$+ \varepsilon_4$</td>
</tr>
<tr>
<td>$Y_{10}$</td>
<td>$= \lambda Y_{10,4} \eta_4$</td>
<td>$+ \varepsilon_5$</td>
</tr>
<tr>
<td>$Y_{11}$</td>
<td>$= \lambda Y_{11,4} \eta_4$</td>
<td>$+ \varepsilon_6$</td>
</tr>
<tr>
<td>$Y_{12}$</td>
<td>$= \lambda Y_{12,4} \eta_4$</td>
<td>$+ \varepsilon_7$</td>
</tr>
<tr>
<td>$Y_{13}$</td>
<td>$= \lambda Y_{13,4} \eta_4$</td>
<td>$+ \varepsilon_8$</td>
</tr>
<tr>
<td>$Y_{14}$</td>
<td>$= \lambda Y_{14,4} \eta_4$</td>
<td>$+ \varepsilon_9$</td>
</tr>
</tbody>
</table>

The proposed structural model, which serves as the basis for this study, can be expressed as a set of structural equations that represent the research problems that will be
investigated. The structural model is expressed as $\eta = B\eta + \Gamma\xi + \zeta$ and represented by a set of structural equations in Table 6.5.

Table 6.5 Structural Model Equations

<table>
<thead>
<tr>
<th>Endogenous variable</th>
<th>Exogenous variables</th>
<th>Endogenous variable</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\eta_2$</td>
<td>$\gamma_{2,1}\xi_1 + \gamma_{2,2}\xi_2$</td>
<td>$\beta_{2,1}\eta_1$</td>
<td>$\zeta_1$</td>
</tr>
<tr>
<td>$\eta_3$</td>
<td>$\gamma_{3,1}\xi_1 + \gamma_{3,2}\xi_2$</td>
<td>$\beta_{3,2}\eta_2$</td>
<td>$\zeta_2$</td>
</tr>
<tr>
<td>$\eta_4$</td>
<td>$\gamma_{4,3}\xi_3$</td>
<td>$\beta_{4,3}\eta_3$</td>
<td>$\zeta_3$</td>
</tr>
</tbody>
</table>

In accordance with the proposed research question and the derived structural model, the following substantive research hypotheses and associated statistical hypotheses were formulated.

**Substantive Research and Statistical Hypotheses**

**Research Hypothesis 1**

The research hypothesis was that the structural model (as depicted in Figure 6.2) provides a valid account of the causal and combined contribution of distal individual variable factors (cognitive ability and social self-confidence) and self-efficacy beliefs in the prediction of the quality of MDM processes and outcomes.

The exact model fit hypothesis was formulated as:

- $H_{01a}$: RMSEA = 0
- $H_{a1a}$: RMSEA > 0

The close model fit hypothesis was formulated as:

- $H_{01b}$: RMSEA $\leq .05$
- $H_{a1b}$: RMSEA = .08

Failure of the model to fit the data will result in model falsification, whereas a good fit supports the theoretical argument that the model of relations is, at least, one potential model that might provide adequate goodness-of-fit to the sample data. Repeated failures to falsify the hypothesized model in different studies, particularly when other competing theories are also tested and disproved, would then add strength to the confidence of the theoretical model.
Although no model can be definitively confirmed, the status of a model as ‘not yet disconfirmed’ is often a powerful one in science (Cohen et al., 2003).

Research Hypothesis 2

Distal individual variables (cognitive ability and social self-confidence) reflect a rough estimate of the upper limit of individual attentional resources that can be devoted to MDM. This implies that individuals with higher cognitive and social self-confidence levels have a larger pool of attentional resources and require a smaller proportion to achieve the same performance outcome when compared to their counterparts. Self-efficacy beliefs, as a proximal and contextually situated individual factor, influence individuals’ interpretative biases that reflect estimates about the amount of attentional resources that will be required and thus mediate the level of affect a manager will experience in response decision demands.

From this the substantive research hypotheses and associated statistical hypotheses are formulated.

Cognitive ability (\(\xi_1\)) will predict decision-generated affect (\(\eta_2\)) with high levels of cognitive ability accounting for lower decision-generated affect. This is expressed in a statistical hypothesis as:

\[ H_{0a}: \gamma_{2,1} = 0 \]
\[ H_{a2a}: \gamma_{2,1} < 0 \]

Social self-confidence (\(\xi_2\)) will predict decision-generated affect (\(\eta_2\)) with high levels of social self-confidence accounting for higher decision-generated affect. This is expressed in a statistical hypothesis as:

\[ H_{0b}: \gamma_{2,2} = 0 \]
\[ H_{a2b}: \gamma_{2,2} < 0 \]

Self-efficacy beliefs (\(\eta_1\)) will predict decision-generated affect (\(\eta_2\)) with high levels of self-beliefs in efficacy accounting for lower decision-generated affect. This is expressed in a statistical hypothesis as:

\[ H_{0c}: \beta_{2,1} = 0 \]
\[ H_{a2c}: \beta_{2,1} < 0 \]
The second segment of the posited model specifies the impact of decision-generated affect ($\eta_2$) on minimizing affect and conservation of attentional resources ($\eta_3$). This leads to the third research hypothesis.

**Research Hypothesis 3**

Decision-generated affect ($\eta_2$) will account for the volitional allocation of attentional resources (i.e., minimizing affect and conservation of attentional resources) ($\eta_3$) with higher levels of decision-generated affect accounting for a higher propensity to avoid decisions. This is expressed in a statistical hypothesis as:

- $H_{03a}: \beta_{3,2} = 0$
- $H_{a3a}: \beta_{3,2} > 0$

**Research Hypothesis 4**

Minimizing affect and conservation of attentional resources ($\eta_3$) will account for lower quality MDM processes and outcomes ($\eta_4$). This is expressed in a statistical hypothesis as:

- $H_{04a}: \beta_{4,3} = 0$
- $H_{a4a}: \beta_{4,3} < 0$

**Summary**

The research problem seeks to answer how distal individual variables (cognitive ability and social self-confidence) in combination with the proximal influence of self-efficacy beliefs mediate temporal processes in the prediction of managers’ information search, deliberation and rational social influence in their decision making processes and outcomes. Although MDM is embedded in a rich nomological network that contains many antecedent and/or consequential latent variables, the present researcher has presented a plausible conceptual model of relations in MDM that reflects the potential associations of variables as time-ordered influences on decision-generated affect and the allocation of attentional resources as mediating influences on the quality of MDM processes and outcomes.

The current chapter provided an overview of the methodology employed. As an *ex post facto* study, the latent variables of interest were not subject to direct manipulation as the nature
of the setting within which the study takes place did not provide an opportunity to manipulate the latent variables. In testing hypotheses about model fit, it was necessary to determine $N$ in order to have adequate power for detecting false hypotheses. The sample size of 196 was shown to meet the requirements to test the model. While the power of inferential statistical tests depends on sample size, the findings provided confidence about the representativeness of the sample. Further, the researcher argued for SEM as the data analysis strategy of choice to address the research problem.

The next chapter reports the results of the statistical analyses aimed at testing the stated null hypotheses.
CHAPTER SEVEN

RESULTS

The theoretical model derived from the literature study hypothesized specific structural relationships between the latent variables that could account for the behavioural variation in managerial decision making. From this model specific statistical hypotheses were formulated in order to test the plausibility of the structural relationships between the latent variables as depicted in Figure 5.2. The purpose of this chapter is to report the results of the statistical analyses as evidence in order to compare how well the proposed model fits the data and, in doing so, evaluate the plausibility of the proposed model.

The evaluation of the measurement part of the model precedes the detailed evaluation of the structural part of the model. Consequently, the presentation of results follows a two-step process in which the measurement model was first estimated to assess the contribution of each indicator measure as well as its reliability in the estimation of the relationships between the exogenous and endogenous variables in order to specify the pattern by which each measure loads on a particular exogenous or endogenous variable. Accordingly, the CFA results are presented first as a test of the validity of the indicator variables. The findings on multivariate normality are followed by the results of the goodness-of-fit for the measurement model and specific evidence of construct validity. Moreover, this evaluation not only provides reliability data but also establishes the independence of the variables in the proposed model.

This is followed by the results of the structural part of the model that focus on the substantive linkages between the various endogenous and exogenous variables in order to determine whether the theoretical relationships as specified are supported by the data. The analysis of the structural relationships are used to confirm whether the proposed structural model, and thus the research hypotheses, could be confirmed. Further, the results were examined for their correspondence to the proposed model of relations in MDM in order to answer questions about the principal relationships with regards to the theory as well as to provide insight into alternative formulations of the model that could be supported.
Univariate and Multivariate Normality

Multivariate normality is the assumption that all variables, and all linear combinations of variables, are normally distributed (Cohen et al., 2003). SEM is more sensitive to the distributional characteristics of the data, particularly the departure from multivariate normality (less critical in the use of EQS) or a strong kurtosis in the data (Hayashi et al., 2008; McDonald & Ho, 2002). A lack of multivariate normality is particularly troublesome because it substantially inflates the chi-square statistic ($\chi^2$) and creates upward bias in critical values for determining coefficient significance. EQS, however, places less stringent assumptions on the multivariate normality of the data (Bentler, 2006; Hair et al., 2006). As illustrated in Table 5.13 earlier, the univariate normality of the indicator variables was rejected in the case of 12 of the 18 indicator variables and the null hypothesis of normality for multivariate normality had to be rejected as well.

The assumptions of multivariate normality and linearity were evaluated through SPSS and EQS. Although the variables were symmetrically distributed, evidence suggested an excess of kurtosis as compared to a normal distribution. Mardia’s coefficient of normalized multivariate kurtosis revealed a value of 5.72 which was relatively high (normality can be assumed inside a -3 to +3 range). Bentler (2006) states that values beyond 3 reflect nontrivial kurtosis while values of 6 and beyond affect modeling statistics. The potential sensitivity of ML to non-normality required the researcher to choose Robust Maximum Likelihood (RML) estimation to fit the measurement and structural models (see Bentler, 2006).

Assessing the Measurement Model

After specifying the measurement model as illustrated in Figure 5.1, the researcher evaluated the goodness-of-fit for the measurement model and the specific evidence of construct validity. In the sample of 196 managers there were no missing data. AMOS 17.0 for Windows (Arbuckle, 2008) and EQS 6.1 (Bentler, 2006) were used to perform a confirmatory first-order factor analysis in order to determine the fit of the model. Tabachnick and Fidell (2001) recommend EQS as the data analysis program of choice when data are non-normal since it is also the only program that offers the Satorra-Bentler scaled $\chi^2$ (SB-$\chi^2$) and residual-based tests (Yuan-Bentler Residual-Based Test Statistic and the Yuan-Bentler Residual-Based F-Statistic).
as the most accurate methods for dealing with non-normal data (Bentler, 2006; Tomarken & Waller, 2005).

As no single measure of fit can provide a conclusive verdict on model fit, the researcher used a spectrum of indices to assess the fit of the proposed measurement model (Byrne, 2006; MacCallum & Austin, 2000; McDonald & Ho, 2002; Savalei & Bentler, 2006). The guidelines recommended by Hair et al. (2006) were used in order to determine the acceptability of fit for the measurement model. For a model with a sample of $N < 250$, with 12 to 30 measured indicators, these authors suggest fit statistics that require a RMSEA of $< .08$, a CFI of $.95$ or better, and a SRMR of $.08$ or less.

Table 7.1 illustrates the goodness of fit statistics for the initial measurement model.

Table 7.1 Goodness of Fit of the Measurement Model (RML)

<table>
<thead>
<tr>
<th>Fit Statistics</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satorra-Bentler Scaled Chi-square ($\chi^2$) of estimated model</td>
<td>218.66</td>
</tr>
<tr>
<td>Degrees of freedom</td>
<td>120</td>
</tr>
<tr>
<td>Significance level</td>
<td>.00</td>
</tr>
<tr>
<td>Yuan-Bentler Residual-Based Test Statistic</td>
<td>145.55</td>
</tr>
<tr>
<td>Significance level</td>
<td>.06</td>
</tr>
<tr>
<td>Yuan-Bentler Residual-Based F-Statistic</td>
<td>1.89</td>
</tr>
<tr>
<td>Significance level</td>
<td>.00</td>
</tr>
<tr>
<td>Standardized RMR</td>
<td>.07</td>
</tr>
<tr>
<td>Root Mean Square Error of Approximation (RMSEA)</td>
<td>.07</td>
</tr>
<tr>
<td>90 Percent Confidence Interval for RMSEA</td>
<td>.05,.08</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Incremental and Parsimony Fit Statistics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bentler-Bonett Normed Fit Index (NFI)</td>
<td>.82</td>
</tr>
<tr>
<td>Comparative Fit Index (CFI)</td>
<td>.91</td>
</tr>
<tr>
<td>Expected Cross-Validation Index (ECVI) for estimated model</td>
<td>1.88</td>
</tr>
<tr>
<td>Expected Cross-Validation Index (ECVI) for saturated model</td>
<td>1.94</td>
</tr>
<tr>
<td>Expected Cross-Validation Index (ECVI) for independence model</td>
<td>6.88</td>
</tr>
<tr>
<td>90 Percent Confidence Interval for ECVI</td>
<td>1.68</td>
</tr>
</tbody>
</table>

**Absolute Fit Statistics**

The absolute fit indices are a direct measure of how well the measurement model reproduces the observed data and, as such, provide the most basic assessment of how well the conceptual model of relations fits the sample data of 196 in this study. The null hypothesis ($H_0$) postulates that specification of the factor loadings, factor variances/covariances, and error
variances for the MDM model are valid and the SB-χ² tests the extent to which this specification is true. Thus, the probability value represents the likelihood of obtaining a SB-χ² value that exceeds the SB-χ² value when H₀ is true. The higher the probability associated with SB-χ², the closer is the fit between the hypothesized model and the more perfect the fit (Byrne, 2001). The measurement model revealed a non-significant p value for SB-χ². On this index the measurement model did not fit the observed correlations and the null hypothesis (H₀) is thus rejected in that the proposed MDM model did not fit the data. The residual-based statistics (Yuan-Bentler Residual-Based Test Statistic and the Yuan-Bentler Residual-Based F-Statistic), however, suggested that the measurement model fitted the data. A statistically insignificant χ² for the Yuan-Bentler Residual-Based Test Statistic (p < .05621) and for the Yuan-Bentler Residual-Based F-Statistic (p < .00153) suggested acceptance of the null hypothesis that the model fits the population data.

Various authors (Arbuckle, 2008, Byrne, 2001; Hair et al., 1998; Hair et al., 2006) however note that a number of factors make χ² particularly troublesome to evaluate goodness-of-fit of a model. Other than the lack of multivariate normality, sample size and model complexity are also contributors. As the number of measured indicators increase (i.e., making the model more complex), so does χ². In order to deal with these negative consequences of χ², other fit indices that compliment the evaluation of the measurement model fit were employed.

The present researcher proceeded with more explorative analyses to assess the measurement model and used the RMSEA which is considered as one of the most informative criteria in SEM (Byrne 2001, 2006). RMSEA, expressed per degree of freedom, makes this index sensitive to the number of estimated parameters in the model (i.e., the complexity of the model). Various authors argue that a RMSEA of .08 represents reasonable errors of approximation in the population and regard this cut-off as the upper limit of reasonable fit. The measurement model RMSEA of .065 suggested a reasonable fit. Further, in order to test for the closeness of fit (i.e., testing the hypothesis that the RMSEA is ‘good’ in the population), the narrower confidence interval for the measurement model also argued for a reasonable fit of the conceptual model to the empirical data.

The root mean square residual (SRMR) reflects a badness-of-fit measure and is especially useful in detecting misspecification (Bentler, 2006). Good-fitting models have small SRMR and values of .08 or less are desired. An arbitrary cut-off of between .05 and .08 is
suggested for SRMR (Hair et al., 2006; Tabachnik & Fidell, 2001). The measurement model reflected a SRMR of .068. As this SRMR value is relatively small it suggests that the model fits the data well regardless of what other measures of fit may imply.

*Incremental and Parsimony Fit Statistics*

Indices of comparative fit that use a baseline independence or null model contrast the ability of the model to reproduce the observed data matrix with that of a model known *a priori* to fit the data poorly, namely one that postulates no paths between the variables in the model. The Bentler-Bonett Normed Fit Index (NFI) is one of the classic fit indices for this purpose. It ranges between 0 and 1 and a model with perfect fit would produce an NFI of 1. A value >.90 was originally considered representative of a well-fitting model (Bentler, 1992) and a revised cutoff value close to .95 has recently been suggested. Bentler (2006), however, notes that NFI is affected by sample size and may not reach higher values even when the model is correct. The NFI for the revised model was .772 suggesting a poorer model fit.

The Comparative Fit Index (CFI) is better to use for model complexity as a fit measure. The CFI of .91 was in line with the proposed cut-off of .95 as a criterion of good fit. Hair et al. (2006) challenge the use of a single cutoff value for fit indices. These authors state that the .90 rule is simply cited as a reasonable ad hoc rule with no support from previous research and the pursuit of achieving a magic value on a fit index can lead to several poor practices in model specification. For example, a CFI of .95 indicates a model with better fit than a similarly complex model with a CFI of .85. It is thus critically important to realize the distinction between testing theory and pursuing a good fit.

Finally, the expected cross-validation index (ECVI) was used as a means to assess the likelihood that the measurement model could be cross-validated across similar sized samples from the same population. Because ECVI coefficients can take on any value, the model ECVI value of 1.88 was compared to that of both the saturated model (ECVI = 1.94) and the independence model (ECVI = 6.88). Given the lower ECVI value for the model, compared to both the independence and saturated models, it was concluded that the model was reasonable in representing an approximation to the population.

Measurement model validity also depends on specific evidence of construct validity. The next subsection deals with convergent and discriminant validity where the researcher
assessed the accuracy of measurements in order to evaluate how well indicator measures from the present sample represented the actual true score that exists in the population of managers. The next subsection illustrates the convergent validity of the measurement model factor loadings with particular attention to non-significant loadings. In addition, the findings of reliability and variance extracted of measured indicators are also presented.

Convergent Validity

Loading estimates that are significant provide a useful start in assessing the convergent validity of the measurement model. All the loadings should be at least .5 and preferably .7 (Hair et al., 2006). Computations for each measurement indicator are reported in Table 7.2.

<table>
<thead>
<tr>
<th>Construct loadings</th>
<th>Cognitive ability (ξ1)</th>
<th>Self-efficacy beliefs (η1)</th>
<th>Social self-confidence (ξ2)</th>
<th>Dec. gen. affect (η1)</th>
<th>Allocation of attentional resources (η1)</th>
<th>MDM processes and outcomes (η1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1 Verbal</td>
<td>.75</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X2 Numerical</td>
<td>.83</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y1 Social Influence efficacy</td>
<td></td>
<td>.90</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y2 Exploratory search and processing efficacy</td>
<td></td>
<td>.86</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y3 Thought and affect control efficacy</td>
<td></td>
<td>.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y4 Risk tolerance efficacy</td>
<td></td>
<td>.54</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y5 Analytical and inferential efficacy</td>
<td></td>
<td>.69</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X3 Assertion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X4 Social boldness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y6 Immediate Affect</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y7 Anticipated Affect</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y8 Decisional Procrastination</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y9 Fatigue</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y10 Bargaining</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y11 Procedural rationality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y12 Decisional quality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y13 Rational social influence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y14 Independence</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Problematic were the low loadings for the latent variable, allocation of attentional resources. In addition, bargaining and procedural rationality also displayed low loadings. This suggested that more of the variance in these indicator measures was due to error variance than explained variance. This is indicative of specification error, that is the omission of relevant
variables from the specified model. It was concluded that possible omitted but theoretically relevant indicators may have accounted for the low loadings on this latent variable.

Table 7.3 illustrates the measurement error of the indicators. The estimates represent squared multiple correlations in order to reflect item reliability and thus show the proportion of variance of an indicator that is explained by its underlying construct variable (with the balance due to measurement error). High multiple squared correlation values denote high reliability, whereas low values are associated with measurement error (Byrne, 2001; Diamantopoulos & Siguaw, 2000; Hair et al., 2006).

<table>
<thead>
<tr>
<th>Measured indicator</th>
<th>Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X_1$ Verbal</td>
<td>.56</td>
</tr>
<tr>
<td>$X_2$ Numerical</td>
<td>.69</td>
</tr>
<tr>
<td>$Y_1$ Social Influence efficacy</td>
<td>.82</td>
</tr>
<tr>
<td>$Y_2$ Exploratory search and processing efficacy</td>
<td>.74</td>
</tr>
<tr>
<td>$Y_3$ Thought and affect control efficacy</td>
<td>.64</td>
</tr>
<tr>
<td>$Y_4$ Risk tolerance efficacy</td>
<td>.29</td>
</tr>
<tr>
<td>$Y_5$ Analytical and inferential efficacy</td>
<td>.47</td>
</tr>
<tr>
<td>$X_3$ Assertion</td>
<td>.54</td>
</tr>
<tr>
<td>$X_4$ Social boldness</td>
<td>.42</td>
</tr>
<tr>
<td>$Y_7$ Immediate Affect</td>
<td>.29</td>
</tr>
<tr>
<td>$Y_6$ Anticipated Affect</td>
<td>.74</td>
</tr>
<tr>
<td>$Y_9$ Decisional Procrastination</td>
<td>.18</td>
</tr>
<tr>
<td>$Y_8$ Fatigue</td>
<td>.12</td>
</tr>
<tr>
<td>$Y_{13}$ Bargaining</td>
<td>.08</td>
</tr>
<tr>
<td>$Y_{10}$ Procedural rationality</td>
<td>.03</td>
</tr>
<tr>
<td>$Y_{11}$ Decision Quality</td>
<td>.35</td>
</tr>
<tr>
<td>$Y_{12}$ Rational social influence</td>
<td>.73</td>
</tr>
<tr>
<td>$Y_{14}$ Independence</td>
<td>.43</td>
</tr>
</tbody>
</table>

The reliability for each construct was further assessed to determine whether the specified indicators were sufficient in their representation of the variable as constructs. The average percentage of variance were extracted (VE) among the set of measured indicators (see Hair et al., 2006, p. 777), and is represented by the following equation:

$$VE = \frac{\sum_{i=1}^{n} \lambda_i^2}{n}$$

Where: $\lambda$ represents the standardized factor loading and $i$ is the number of items.

The construct reliability (CR) value was also computed as:
These results of these computations are reported in Table 7.4

Table 7.4 Variance Extracted and Reliability Estimates of the Latent Variables

<table>
<thead>
<tr>
<th></th>
<th>Cognitive ability (ξ₁)</th>
<th>Self-efficacy beliefs (η₁)</th>
<th>Social self-confidence (ξ₂)</th>
<th>Dec. gen. Affect (η₂)</th>
<th>Allocation of att resources (η₃)</th>
<th>MDM processes &amp; outcomes (η₄)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variance extracted</td>
<td>.51</td>
<td>.49</td>
<td>.40</td>
<td>.43</td>
<td>.13</td>
<td>.60</td>
</tr>
<tr>
<td>Construct reliability</td>
<td>.67</td>
<td>.82</td>
<td>.57</td>
<td>.59</td>
<td>.18</td>
<td>.64</td>
</tr>
</tbody>
</table>

Variance-extracted is a summary of measured indicators of convergence and values should be equal or exceed .5 (50 percent), while .7 is considered the threshold for reliability of a construct (Hair et al., 2006). The allocation of attentional resources fell far short of the recommended 50 percent. This lower level of variance extracted indicated that more than half of the variance for the specified indicators was not accounted for by the latent variable they were representing. The composite construct reliabilities were acceptable except for the latent variable, allocation of attentional resources. A rule of thumb for reliability estimates is that .70 or higher suggests good reliability and values between .60 and .70 may be acceptable.

In conclusion, the researcher may have been overoptimistic in the selection of operational indicators to represent an adequate empirical grasp for the allocation of attentional resources as a latent variable. The findings from Tables 7.2, 7.3 and 7.4 indicate that the selected operational indicators failed to provide an adequate empirical grasp to reflect this latent variable. The researcher adopted the notion that affect induces a motivational process that undermines the volitional allocation of attentional resources. For instance, minimizing affect and the regulation of attentional resources are emotion-focused forms of coping (see, for example, Brown et al., 2005; DeShon & Gillespie, 2005; Finkel et al., 2006; Hockey et al., 2000; Ferrari & Pychyl, 2007; Luce, 1998; Tice et al., 2007; Vohs et al., 2008).

The failure of the selected indicators in their representation of the allocation of attentional resources suggested that they were more likely representing different underlying
latent variables or even a multidimensional construct. Although avoidance, evasion and escape behaviours all reflect affect minimization concerns, Spunt et al. (2009) suggest that aversive indecisiveness, characterized by negative affect and threat-oriented cognition need to be theoretically distinguished from avoidant preferences and difficulties when making decisions.

Further investigation of construct validity was examined with discriminant validity and this is discussed in the next subsection.

**Discriminant validity**

The interconstruct correlations were examined after standardization of the covariances in order to determine evidence of discriminant validity. The findings as reported in Table 7.5 illustrate the discriminability between the latent variables.

<table>
<thead>
<tr>
<th>Table 7.5 Discriminability between Latent Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive ability (ξ₁)</td>
</tr>
<tr>
<td>Cognitive ability (ξ₁)</td>
</tr>
<tr>
<td>Self-efficacy beliefs (η₁)</td>
</tr>
<tr>
<td>Social self-confidence (ξ₂)</td>
</tr>
<tr>
<td>Decision-generated affect (η₂)</td>
</tr>
<tr>
<td>Allocation of attention resources (η₃)</td>
</tr>
<tr>
<td>Quality of MDM processes and outcomes (η₄)</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

where * denotes $p < .05$

The informative description picture of the interrelations in Table 7.5 provide evidence to suggest that the latent variables are indeed distinct and capture different phenomena that the other variables do not. Cognitive ability and social self-confidence traits were empirically distinct and in accordance with previous empirical findings (Hochwarter, Witt, Treadway, & Ferris, 2006). Further, cognitive ability ($r = .57$, $p < .05$) and social self-confidence (.34, $p < .05$) were independently related to individual differences in MDM (e.g., McDaniel et al., 2001; Parker & Fischhoff, 2005; Peters et al., 2006; Schmidt et al., 2008; Stanovich & West, 2000; Weekley & Ployhart, 2005). Self-efficacy beliefs also displayed a positive relationship with the
quality of MDM processes (.19, \( p < .05 \)) (e.g., Hu et al., 2007; Le Roux et al., 2006; Tasa & Whyte, 2005). The positive relations between social self-confidence and individual differences in MDM were also in accord with previous empirical findings (e.g., Ferris et al., 2005; Kolodinsky et al., 2007; Sullivan et al., 2003). These findings confirmed that MDM requires several abilities (e.g., Finucane & Lees, 2005; Parker & Fischhoff, 2005).

It was pointed out earlier that objective measures of ability do not always correlate highly with self-efficacy beliefs and that the relations between objective (e.g., cognitive ability) and subjective beliefs in ability (e.g., self-efficacy beliefs) are relatively unknown (Austin & Klein, 1996). As conceptualized by Locke and Latham (1990a) and empirically demonstrated (see, for example, Kanfer & Ackerman, 1989, 2000; Mitchell, Hopper, Daniels, George-Falvy, & James, 1994), self-efficacy beliefs and cognitive ability were empirically independent. This empirical independence of cognitive ability and self-efficacy beliefs underscores self-efficacy beliefs as a proximal task-specific motivational construct that acts as a threshold variable in determining whether individuals choose to deploy their available attentional resources (i.e., cognitive ability) in a task (Kanfer & Ackerman, 2005).

Self-efficacy beliefs were also linearly related to the quality of MDM processes (.18, \( p < .05 \)) which was in accord with empirical findings (e.g., Bandura & Jourden, 1991; Huhmann, & Hyman, 2007; O'Connor & Arnold, 2001; Sullivan et al., 2003; Tasa & Whyte, 2007). For example, Wood and Bandura (1989b) report a linear relationship between self-efficacy beliefs and the application of a systematic-comprehensive decision process to be .39, and Wood et al. (1990) report .24 in a follow-up study.

Social self-confidence (i.e., the confidence and willingness to engage in social influence) showed a positive linear relationship with MDM (.34, \( p < .05 \)) and also displayed a positive linear relation with self-efficacy beliefs. This was in accordance with Bandura’s (1997) view that generic self-efficacy beliefs (i.e., confidence) and domain self-efficacy beliefs are not entirely independent (see, also, Chen et al., 2000; Haleblian et al., 2004). Moreover, social self-confidence (e.g., political skill as the expression of personality in a socially adaptive fashion) was shown to be independent from cognitive ability but related to self-efficacy beliefs (Ferris et al., 1999; Ferris et al., 2005; Perrewé et al., 2004).

Lower cognitive ability (i.e., limited attentional resource capacity) displayed a negative relationship with decision-generated affect, where lower ability individuals showed higher
negative decision affect when faced with decisional challenges (-.18, p < .05). Self-efficacy beliefs also demonstrated a negative relation with decision-generated affect (-.40, p < .05) which was in accord with previous research findings. For instance, Arenas et al. (2006) demonstrated that the influence of higher self-efficacy beliefs was significant on positive affect (.61) in a study of decision making at a furniture factory when faced with ambiguity. It was pointed out that intensity of decision affect is relevant for the allocation of attention to the extent that affect impedes complex task performance (Austin & Klein, 1996). Negative affective self-reactions (decision-generated affect) are thus related to the diversion of attentional resources away from effortful cognitive and interpersonal information collection, deliberation, influence and negotiation, and allocated to efforts to the minimization of threat and the conservation of attentional resources. Such a cognitive interference redirects attentional resources away from the decision process towards volitional inaction that favours the maximization of positive affect and the avoidance of decisions (Baumeister et al., 2007; Bettman et al., 1998; Foo et al., 2009; Luce, 1998, 2005; Luce et al., 1997).

In conclusion, these interconstruct correlations among the latent variables aided in nomological validity (Hair et al., 2006) and provided confidence to suggest that they were related in a manner that supported the theorizing in the proposed model of relations in MDM.

**Overall Evaluation: Measurement Model**

The Satorra-Bentler Scaled Chi-square (SB-χ²) showed a statistically significant chi-square suggesting that the model did not fit the population data. Conversely, the Yuan-Bentler Residual-Based Test Statistic and Yuan-Bentler Residual-Based F Statistics both revealed non-significant values. It was pointed out that SEM is sensitive to a strong kurtosis in the data and chi-square is sensitive to excessive kurtosis. The Mardia’s coefficient of normalized multivariate kurtosis was 5.72 and values of 6 and beyond affect modeling statistics (Bentler, 2006).

With regards to other fit statistics, the CFI value was not smaller than .90 (.91) and the RMSEA value of .07 was not higher than .08. Additionally, the researcher followed Bentler’s (2006) advice to include SRMR with a recommended value of .08 or lower. An arbitrary cutoff of between 0.05 and 0.08 is also suggested for SRMR by Byrne (1998). The SRMR was
A SRMR value of less than .10 is acceptable according to Hair et al. (2006). In addition, the measurement model outperformed the independence model given an acceptable ECVI value.

One problem in the measurement model was the failure of the measured indicators to provide an acceptable grasp of the allocation of attentional resources as a latent variable. The low level of variance extracted indicated that a significant part of the variance for the two specified indicators was not accounted for by the latent variable they were representing. Consequently, this lack of convergent validity proved that this latent variable was degrading the model and that the analysis of the hypothesized structural relations might be threatened. Except for the allocation of attentional resources, however, the composite construct validities indicated that the measured indicators represented their latent variables. The general nomological validity demonstrated that the latent variables were related to one another. The discriminability between the latent variables, and the extent to which each latent variable was truly distinct from other latent variables, demonstrated that the latent variables were related to one another in a manner that supported the proposed model of relations in MDM.

The study was approached not only to improve model fit but to evaluate the causal relations in MDM. In spite of the aforesaid limitations, the researcher deemed it necessary to retain the offending indicators in order to explore why the model was not fitting, knowing full well that if a poor structural model fit would be obtained it would not be possible to unequivocally rule out the possibility that it was not due to inherent structural flaws but rather to shortcomings in the operationalization of specific latent variables. This was important given the fact that MacCallum and Austin’s (2000) review showed that approximately 20% of SEM studies were strictly confirmatory, 25% for model generation and 55% for the investigation of alternative models. These authors remarked that the relatively common usage of the first two strategies is unfortunate. This is because these strategies are highly restrictive and leave little recourse if that model does not work. Such data-driven model modifications may lack validity and are highly susceptible to capitalization on chance.

In evaluating the structural part of the model, the next subsection focuses on the substantive relationships of interest (i.e. the linkages between the various endogenous and exogenous latent variables) in order to assess whether the theoretically specified relations were supported by the data. The emphasis moves from the relationship between constructs and
measured indicators to the nature and magnitude of the relationships between the construct variables. This assessment includes the signs of the parameters representing the paths between the variables to indicate whether the direction of the hypothesized relationships as hypothesized is positive or negative. Further, the magnitudes of the estimated parameters provide important information on the strength and significance of the hypothesized relationships (at the very least these parameters should be significant \( p < .05 \) as indicated by t-values in excess of 1.96). In this instance, the null hypothesis will be rejected. The squared multiple correlations for the structural equations indicate the amount of variance in each endogenous latent variable that is accounted for by the latent variables that are expected to impact on it. The higher the squared multiple correlation, the greater the joint explanatory power of the hypothesized antecedents (Diamantopoulos & Siguaw, 2000) in the prediction of the quality of MDM processes.

**Assessment of the Structural Model**

Generally, a structural equation model is a complex composite statistical hypothesis (McDonald & Ho, 2002) where the specific paths depicted in the structural model represent the hypothesised causal linkages derived through theorizing. The proposed structural model that served as the basis for this study was portrayed in Figure 5.2.

**Overall goodness-of-fit of the Structural Model**

The number of model parameters that were set free to be estimated \( (t = 45) \) were less than the number of non-redundant elements in the observed sample matrix, calculated as \( s = p \) (the number of endogenous indicators) + \( q \) (the number of exogenous indicators) \( (p + q)(p + q + 1) \). The degrees of freedom for the structural model were 126. The positive number of degrees of freedom indicated an overidentified structural model and thus representative of the overall sample of respondents.

The question that needed to be answered in this study was ‘Does the model produce an estimated population covariance matrix that is consistent with the sample (observed) covariance matrix?’ If the model is good, the parameter estimates will produce an estimated matrix that is close to the sample covariance matrix. Hair et al. (1998) also express the opinion that a covariance matrix should be employed when the objective is to test a model since covariances satisfy the assumptions of the methodology and are the appropriate form of data for
validating causal relationships. Given the purpose of the study to test a series of causal relationships, the researcher selected covariances as the preferred input matrix. A spectrum of the indices to assess the goodness-of-fit statistics for the structural model is presented first and a more detailed presentation of these results follows thereafter.

*Evaluation of Model Estimates and Modification*

The normalized estimate of Mardia’s coefficient was 5.72 (normality can be assumed inside a -3 to +3 range). As the coefficient exceeded this range, robust computational methods and robust statistics were used in order to evaluate the model. Bentler (2006) stated that the Satorra-Bentler methodology and the residual-based tests are probably the most accurate methods for dealing with nonnormal data and the Satorra-Bentler Scaled Chi-square (SB-$\chi^2$), the Yuan-Bentler Residual-Based Test Statistic and the Yuan-Bentler Residual-Based F-Statistic to test the goodness-of-fit of factors were used. Better fit is represented by lower chi-squares and higher probability values.

Additionally, the present researcher considered a range of multiple fit indices to obtain a holistic evaluation of structural model fit. The RMSEA was used to evaluate how well the structural model would, with unknown but optimally chosen parameter values, fit the population data if it were available. As indicated earlier, values of $< .05$ indicate good fit, whereas values less than .08 correspond to an ‘acceptable’ fit (McDonald & Ho, 2002). Further, the SRMR as a badness-of-fit measure was used in order to detect possible misspecification (Bentler, 2006), where good-fitting models show a small SRMR (values of .08 or less [Bentler, 2006]). The CFI was used in which a good fit is $>.90$.

*Overall Model Fit Measures*

An admissible solution of parameter estimates of the structural model was obtained after 30 iterations. In addition to the examination of the reliabilities for each measured indicator earlier (see Table 7.4), the researcher assessed the composite model reliability of the 6-factor latent variable model. The model-based reliability, that is the multi-factor internal consistency, rho ($\rho$), was .91 (see Bentler, 2006). The spectrum of goodness-of-fit statistics of the hypothesized structural model are presented next in Table 7.6.
The $p$-value of the Satorra-Bentler Scaled Chi-square ($\chi^2$) of estimated model in Table 7.6 yielded a highly significant result ($p < 0.0001$). The null hypothesis is that the model fits the population data perfectly and a statistically significant chi-square causes rejection of the null hypothesis, implying imperfect model fit and possible rejection of the model. The Yuan-Bentler Residual-Based Test Statistic of 156.48 ($p < 0.034$) and the Yuan-Bentler Residual-Based F-Statistic of 2.30 ($p < 0.00001$) yielded a weak non-significant result that partly supported the model. Given these results, the null hypothesis was rejected, that is that the structural model fits the population data. Relying on these indices alone, however, is highly restrictive because it is implausible that any model is anything more than an approximation of reality (Diamantopoulos & Siguaw, 2000) and rejection of a model on purely statistical grounds is not necessarily a condemnation (Arbuckle, 2008).

Indeed, since a null hypothesis that a model fits exactly in some population is known a priori to be false, it seems pointless even to try and test whether it is true (Diamantopoulos &
Siguaw, 2000). Given the known sensitivity of this statistic to sample size, the use of $\chi^2$ index provides little guidance in determining the extent to which the structural model does not fit. Rather than trying to ask whether a model is correct, or whether it fits the population data exactly, it seems sensible to assess the degree of lack of fit of the model with reference to other measures as well. Thus, the present researcher regarded it beneficial to rely on other indices of fit.

RMSEA indicated a value of .07. The RMSEA and the wide confidence interval (.06, .09), however, suggested that the estimated discrepancy value was quite imprecise, thus negating a clear indication to accurately determine the degree of fit in the population. The SPSS translation of the SAS syntax provided by MacCallum, Browne, and Sugawara (1996) was further applied in order to derive power estimates for the tests of exact and close fit. A power value of .99 was obtained for the test of exact fit. The probability of rejecting the null hypothesis of exact fit under the true condition of close fit was thus high. Consequently, there may be a high chance of rejecting a good (if not perfect) structural model with the given sample size and the likelihood of rejecting the hypothesis of exact fit was thus more than 0.98 that the true fit is close. Therefore, the hypothesis of exact fit was rejected ($H_{01b}$: RMSEA $\leq$ .05 $H_0$: RMSEA=0|RMSEA=0,05]=0,99) in favour of $H_{a1b}$: RMSEA = .08.

The assessment of parsimonious fit acknowledges that model fit can always be improved by adding more paths to the model and estimating more parameters until perfect fit is achieved in the form of a saturated or just-identified model with no degrees of freedom. The parsimonious fit measures were subsequently considered. The NFI Bentler-Bonett Non-Normed Fit Index (both close to or above 0.90 is typically adopted as an indication of good fit), CFI and Bollens (IFI) (best if both are close to .95 or greater) indicate how much better the model fits compared to a baseline model, usually the independence model. All these indices fell below the desired threshold levels. The NFI was .79, the Bentler-Bonett Non-Normed Fit Index was .85, the CFI was .87 and Bollens IFI was .88.

The ECVI was used as a measure to assess whether the model is likely to cross-validate across samples of the same size from the same population. As a useful indicator of a model's overall fit, the ECVI value was compared against the ECVI values of other models, where the model with the smallest difference ECVI value represents the greatest potential for implied replication. The 'other' model used for comparison purposes was the independence model (also
known as the null model) with complete independence among all variables (i.e., all observed variables are uncorrelated). The ECVI value of the model was 1.85, which was much lower than that of the independence model (6.70), but slightly more than the ECVI value of the saturated model (1.75). This suggested that the model was less likely to be cross-validated across samples of the same size from the present population. These incremental and parsimonious indices as illustrated in Table 7.6 pointed to the possibility of an alternative model that may contain a number of additional paths that may be nested within a more elaborate model.

Finally, in order to ensure a thorough assessment of the fit of the structural model the researcher also investigated the standardized residuals and modification indices in order to determine the extent of success with which the model explains the observed data. The next subsection examines the standardized residuals and modification indices.

**Evaluation of Residuals and Modification Indices**

Residuals are probably the single most informative set of fit indices because they point directly to the location and size of the discrepancy (in meaningful units) between the observed and the expected covariances (Savalei & Bentler, 2006). Standardized residuals represent the differences between the observed values and the estimated values in a matrix. These residuals should be small and centered around zero and the frequency distribution of the residual covariances should be symmetric. Non-symmetrically distributed residuals in the frequency distribution may signal a poor-fitting model, that is estimating some of the covariances well and others poorly (Bentler, 2006; Cohen et al., 2003; Tabachnick & Fidell, 2001). The distribution of standardised residuals was confirmed in terms of symmetry and presented in Figure 7.1 and Table 7.7. In Figure 7.1 each "*" represents 5 residuals: where 1 corresponds to residuals smaller than .0 to -.05 and C corresponds to residuals of .5 and more.
Figure 7.1 Distribution of Standardized Residuals

Table 7.7 Frequency Distribution of Standardized Residuals

<table>
<thead>
<tr>
<th>Range</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-0.5 to -0.0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>-0.4 to -0.5</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>-0.3 to -0.4</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>-0.2 to -0.3</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>-0.1 to -0.2</td>
<td>15</td>
</tr>
<tr>
<td>6</td>
<td>0.0 to 0.10</td>
<td>79</td>
</tr>
<tr>
<td>7</td>
<td>0.1 to 0.00</td>
<td>57</td>
</tr>
<tr>
<td>8</td>
<td>0.2 to 0.10</td>
<td>14</td>
</tr>
<tr>
<td>9</td>
<td>0.3 to 0.20</td>
<td>3</td>
</tr>
<tr>
<td>A</td>
<td>0.4 to 0.30</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>0.5 to 0.40</td>
<td>0</td>
</tr>
<tr>
<td>C</td>
<td>++ to 0.50</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>171</td>
<td>100.00</td>
</tr>
</tbody>
</table>

The distribution of standardized residuals clustered in a modestly negatively skewed manner around the zero point. Most of the residuals centered in the middle of the distribution with a slightly elevated negative tail suggesting a reasonable model fit. There were no
standardized residuals exceeding the -4.0 approximate benchmark value that would suggest a potentially unacceptable degree of error that might call for the deletion of offending items. The slight dominance of negative residuals indicated that the model overestimates the covariance between the observed variables which could be remedied through the pruning of the paths that are associated with the indicator variables in question.

The present researcher took caution not to consider model respecifications to improve fit that could not be theoretically justified (Hair et al., 2006). Although the variables associated with these extreme residuals were examined there was no clear identifiable justification to suggest a possible model modification given the possibility that the addition of one or more paths would probably have improved the fit of the model. It was decided to refrain from specification searches based on purely empirical grounds in spite of the existence of a number of correlated errors. Such correlated errors are hard to explain (Savalei & Bentler, 2006) and the researcher accepts that such modifications are inconsistent with the theoretical basis of SEM. SEM is a large sample technique (Savalei & Bentler, 2006) and it was decided to dismiss model modification because of the small sample in this study. Furthermore, the researcher examined the modification indices for any standardized expected change that could suggest freeing up some of the parameters. The magnitude of the modification indices associated with the parameters did however not warrant setting any of these parameters free.

The aim of evaluating the structural model was to determine whether the causal linkages between the various endogenous and exogenous latent variables as was specified at the conceptualization stage (as illustrated in Figure 2.1) were indeed supported by the data. These causal linkages were investigated by testing the null hypotheses as formulated in Chapter Four and depicted in Figure 5.2. Depending on the outcome of these tests, the research hypotheses were thus either confirmed or rejected. It is necessary at this stage to point out that obtaining a significant path coefficient estimate does not imply proof of a causal effect. Due to the ex post facto research design in this study it was not possible to isolate the empirical system sufficiently so that the nature of the relationships among the variables can be described as causal. Consequently, the nature of the non-experimental research design precluded the drawing of causal inferences from significant path coefficients (Theron, Spangenberg, & Henning, 2004).
Assessing the Structural Model

There are four issues of relevance when evaluating the structural model, that is: the significance of the parameter beta and gamma estimates ($\beta_i$ and $\gamma_i$) that represent the hypothesized paths between the variables; the consistency of the signs of the parameter estimates and the hypothesized nature of the relationships between the latent variables; the magnitude of the parameter estimates that indicate the strength of the hypothesized relationships; and the proportion of variance in each endogenous variable that is explained by the variables linked to it in terms of the hypothesized structural model. The results depicted in Figure 7.2 provide information on the beta ($\beta_i$) and gamma ($\gamma_i$) path coefficients with which to evaluate each of the relevant statistical hypotheses which were formulated earlier. Each of these parameter estimates provided information which was used to assess the hypothesized relationships between the endogenous variables within the structural model.

Standardized regression coefficients are particularly useful to index the magnitude of causal effects rather than the $\beta$’s in raw units because of the advantage of simplicity of exposition that ensues when one can ignore the units of measurement (Arbuckle, 2008; Cohen et al., 2003; Hair et al., 2006; Preacher, Rucker, & Hayes, 2007). The estimated beta ($\beta_i$) and gamma ($\gamma_i$) coefficients are presented in Figure 7.2 and evaluated against each of the relevant statistical hypotheses as illustrated in Table 7.8.
Figure 7.2 Total Direct Effects: Standardized Path Estimates for the Structural Model of MDM.

where * denotes $p < .05$. 

\begin{align*}
\theta_{1,1} &= .01 \\
\theta_{2,1} &= .49 \\
\gamma_{3,1} &= -.59^* \\
\gamma_{2,1} &= -.22^* \\
\gamma_{2,2} &= .25^* \\
\gamma_{3,1} &= -.64^* \\
\beta_{2,1} &= -.54^* \\
\beta_{3,1} &= -.59^* \\
\beta_{3,2} &= .34^* \\
\beta_{4,3} &= -.64^* \\
\end{align*}
<table>
<thead>
<tr>
<th>Substantive research hypotheses</th>
<th>Statistical hypotheses</th>
<th>Parameter Beta (βi) and Gamma (γi) coefficients</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The structural model (as depicted in Figure 6.8) provides a valid account of the causal and combined contribution of distal individual variable factors (cognitive and social self-confidence) and self-efficacy beliefs in the prediction of the quality of MDM processes and outcomes.</td>
<td>The exact model fit hypothesis is formulated as:</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>$H_{0a}: \text{RMSEA} = 0$</td>
<td>$H_{a}a: \text{RMSEA} &gt; 0$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$H_{0b}: \text{RMSEA} \leq .05$</td>
<td>$H_{a}b: \text{RMSEA} = .07$</td>
<td>Yes</td>
</tr>
<tr>
<td>2a. Cognitive ability ($\xi_1$) will predict decision-generated affect ($\eta_2$) such that high levels of cognitive ability will account for lower decision-generated affect.</td>
<td>$H_{0a}: \gamma_{2,1} = 0$</td>
<td>$\gamma_{2,1} = -.22^*$</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>$H_{a}a: \gamma_{2,1} &lt; 0$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2b. Social self-confidence ($\xi_2$) will predict decision-generated affect ($\eta_2$) such that high levels of social self-confidence will account for higher decision-generated affect.</td>
<td>$H_{0b}: \gamma_{2,2} = 0$</td>
<td>$\gamma_{2,2} = .25^*$</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>$H_{a}b: \gamma_{2,2} &lt; 0$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2c. Self-efficacy beliefs ($\eta_1$) will predict decision-generated affect ($\eta_2$) such that high levels of self-beliefs in efficacy will account for lower decision-generated affect.</td>
<td>$H_{0c}: \beta_{2,1} = 0$</td>
<td>$\beta_{2,1} = -.54^*$</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>$H_{a}c: \beta_{2,1} &lt; 0$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Decision-generated affect ($\eta_2$) will predict the allocation of attentional resources such that high levels of decision-generated affect will account for minimizing affect and conservation of attentional resources ($\eta_3$) such that high levels of decision-generated affect will account for high avoidance of decisions.</td>
<td>$H_{0a}: \beta_{3,2} = 0$</td>
<td>$\beta_{3,2} = .34^*$</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>$H_{a}a: \beta_{3,2} &gt; 0$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. The allocation and conservation of attentional resources ($\eta_3$) will predict lower quality MDM processes and outcomes ($\eta_4$).</td>
<td>$H_{0a}: \beta_{4,3} = 0$</td>
<td>$\beta_{4,3} = -.64^*$</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>$H_{a}a: \beta_{4,3} &gt; 0$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

where * denotes $p < .05$. 
The null hypothesis that the model fits the population data perfectly was rejected (Hypothesis 1). The Yuan-Bentler Residual-Based Test Statistic and the Yuan-Bentler Residual-Based F-Statistic however suggested part support for the structural model. In addition, the structural model was also not likely to cross-validate across samples of the same size from the present population. The RMSEA was also used as an important informative criterion that takes into account the error of approximation in the population and revealed a value that indicated a less than satisfactory model fit. It was argued that the poor fit may not be due to the inherent structural flaws in the model but more because the present researcher could not unequivocally rule out the possibility of the shortcomings in the operationalization of some of the latent variables. It was possible that omitted but theoretically relevant indicators may have contributed to a contaminated measurement of some of the constructs. The fact that the present researcher used only two measured indicators could have increased the infeasible solution that was obtained. The limited number of measured indicators may not have captured the multidimensionality of decision-generated affect and the allocation of attentional resources. As MDM is embedded in a rich nomological network with numerous antecedent and/or consequential variables, there was a possibility of an alternative model that may contain a number of additional latent variables and paths nested within a more elaborate model.

Support was found for Hypothesis 2a. The total standardized direct effect of cognitive ability on decision-generated affect was significant. The total standardized direct effect of social self-confidence on decision-generated affect was supported (Hypothesis 2b). Affective reactions are potent indicators for the activation of social self-confidence and unfavourable appraisals of decisional challenge (i.e., face disagreement and being forced to justify a decision) interfere with valued social goals that may inhibit the expression of social self-confidence. How affect is appraised may thus cause decrements in decision making that force shifts in attentional resource allocations to an off-task, affective heuristic in order to get along and act in a manner that is most likely to be acceptable to others. Social self-confidence is thus inversely related to the availability of attentional resources as mediated by decision-generated affect.

The total standardized direct effect of self-efficacy beliefs on decision-generated affect was significant (Hypothesis 2c) and in accord with previous research findings. The total
standardized direct effect of decision-generated affect on the allocation of attentional resources in MDM was significant (Hypothesis 3). Increased decision-generated affect accounted for a volitional reduction in the allocation of attentional resources (i.e., minimizing affect and conservation of attentional resources). The allocation of attentional resources accounted for the prediction of the quality of MDM processes and outcomes (Hypothesis 4). The total standardized direct effect of the volitional allocation of attentional resources on the quality of MDM process was also significant.

One practical question in this study concerned the relative contribution of self-efficacy beliefs over that of distal individual factors as an alternative predictor to the quality of MDM processes. Earlier (as illustrated in Table 7.5), self-efficacy beliefs were shown to be linearly related to the quality of the MDM process and outcomes \( (r = .18, p < .05) \). The next subsection provides evidence of the differential contribution of self-efficacy beliefs over that provided by cognitive ability and social self-confidence.

**Direct and Indirect (Mediated) Effects**

It was argued that the quality of MDM processes is inherently conditional on the proximal independent and interactive internal attributions of self-efficacy beliefs in combination with cognitive ability and social self-confidence. The empirical review illustrated that relatively few studies have estimated the independent contributions of distal individual differences (cognitive ability and social self-confidence traits) in combination with the proximal influence of self-efficacy beliefs in performance. There is no extant research with regards to this in MDM. Table 7.9 illustrates the standardized indirect effects of the distal individual variables (i.e., cognitive ability and social self-confidence) and self-efficacy beliefs on the allocation and conservation of attentional resources that in turn have a bearing on the quality of MDM processes and outcomes.

<table>
<thead>
<tr>
<th>Table 7. 9 Standardized Indirect Effects: Individual Variables, Volition and MDM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cognitive ability</strong> ( (\xi_1) )</td>
</tr>
<tr>
<td>Allocation of attentional resources ( (\eta_3) )</td>
</tr>
<tr>
<td>Quality of MDM processes &amp; outcomes ( (\eta_4) )</td>
</tr>
</tbody>
</table>
Table 7.9 provides for an informative descriptive picture of the causal relations between the distal individual variables and self-efficacy beliefs in order to account for individual differences in the quality of MDM processes and outcomes. The distal individual variables (i.e., cognitive ability and social self-confidence) exerted their effects directly on the quality of MDM processes. Self-efficacy beliefs’ direct contribution was smaller. Given this observation, the researcher explored the model further by deleting the influence of cognitive ability and social self-confidence from the original model in order to investigate the direct causal and indirect influence of self-efficacy beliefs in a trimmed structural model without these paths. Table 7.10 illustrates the fit statistics of the trimmed structural model.

Table 7. 10 Trimmed Structural Model Fit Measures: Robust Maximum Likelihood (RML)

<table>
<thead>
<tr>
<th>Fit Statistics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute Fit Statistics</td>
<td></td>
</tr>
<tr>
<td>Satorra-Bentler Scaled Chi-square ($\chi^2$) of estimated model</td>
<td>138.10</td>
</tr>
<tr>
<td>Degrees of freedom</td>
<td>73</td>
</tr>
<tr>
<td>Significance level</td>
<td>.00</td>
</tr>
<tr>
<td>Yuan-Bentler Residual-Based Test Statistic</td>
<td>101.42</td>
</tr>
<tr>
<td>Significance level</td>
<td>.02</td>
</tr>
<tr>
<td>Yuan-Bentler Residual-Based F-Statistic (73, 123)</td>
<td>1.84</td>
</tr>
<tr>
<td>Significance level</td>
<td>.00</td>
</tr>
<tr>
<td>Standardized RMR</td>
<td>.09</td>
</tr>
<tr>
<td>Root Mean Square Error of Approximation (RMSEA)</td>
<td>.07</td>
</tr>
<tr>
<td>90 Percent Confidence Interval for RMSEA</td>
<td>.050, .084</td>
</tr>
</tbody>
</table>

| Incremental and Parsimony Fit Statistics          |        |
| Bentler-Bonett Normed Fit Index (NFI)             | .84    |
| Bentler-Bonett Non-Normed Fit Index               | .90    |
| Comparative fit Index (CFI)                       | .92    |
| Bollen’s (IFI) Fit Index                          | .92    |
| Expected Cross-Validation Index (ECVI) for estimated model | 1.11    |
| Expected Cross-Validation Index (ECVI) for saturated model | 1.08 |
| Expected Cross-Validation Index (ECVI) for independence model | 4.93 |
| 90 Percent Confidence Interval for ECVI           | .95    |
The trimmed model converged after 9 iterations. The model-based reliability (the multi-factor internal consistency), rho ($\rho$), was .90. Fit statistics for the trimmed structural model in Table 7.6 indicated that the data fit the model reasonably well (Hair et al., 2006). The trimmed model represented a good fit (RMSEA = .07, CFI = .92 and SRMR .09). The standardized direct causal effects of self-efficacy beliefs in the trimmed model were subsequently investigated and are presented in Table 7.11.

Table 7.11 Standardized Direct Effects of Self-Efficacy Beliefs on Decision-Generated Affect, Volition and MDM

<table>
<thead>
<tr>
<th>Decision-generated affect ($\eta_3$)</th>
<th>Self-efficacy beliefs ($\eta_1$)</th>
<th>Decision-generated affect ($\eta_2$)</th>
<th>Allocation of attentional resources ($\eta_3$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decision-generated affect ($\eta_3$)</td>
<td>- .44**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allocation of attentional resources ($\eta_3$)</td>
<td></td>
<td>.59**</td>
<td></td>
</tr>
<tr>
<td>Quality of MDM processes &amp; outcomes ($\eta_1$)</td>
<td></td>
<td></td>
<td>-.37*</td>
</tr>
</tbody>
</table>

where ** denotes $p < .001$ and * denotes $< .05$

The direct effects of self-efficacy beliefs on decision-generated affect was $\beta_{2,1} = -.44$ ($p < .05$) and the direct effects of decision-generated affect on the allocation of attentional resources was also significant ($\beta_{3,1} = .59, p < .05$). This, in turn, had a significant effect on the quality of MDM processes and outcomes ($\beta_{4,1} = -.37, p < .05$). Figure 7.3 illustrates the estimated beta ($\beta_i$) and gamma ($\gamma_i$) coefficients in the trimmed model.
Figure 7.3 Standardized Total Direct and Indirect Estimates for the Trimmed Structural of Model of MDM
where * denotes $p < .05$.
The next subsection presents the variance in the endogenous latent variables that is accounted for by the independent exogenous latent variables by way of squared multiple correlations ($R^2$).

**Variance Explained in Endogenous Latent Variables**

Squared multiple correlations ($R^2$) indicate the amount of each endogenous latent variable that is accounted for by the exogenous latent variable that is expected to impact on it. Clearly, the higher the squared multiple correlation, the greater the joint explanatory power of the hypothesized antecedent exogenous latent variables (Diamantopoulos & Siguaw, 2000). The $R^2$s for the original and trimmed structural model are illustrated in Table 7.12.

<table>
<thead>
<tr>
<th>Endogenous latent variables</th>
<th>Original model estimate</th>
<th>Trimmed model estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decision-generated affect ($\eta_2$)</td>
<td>.27</td>
<td>.20</td>
</tr>
<tr>
<td>Allocation of attentional resources ($\eta_3$)</td>
<td>.96</td>
<td>.35</td>
</tr>
<tr>
<td>The quality in MDM processes ($\eta_4$)</td>
<td>.41</td>
<td>.15</td>
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It was pointed out earlier that MDM contains many antecedent and/or consequential variables that are likely to be transmitted through additional links in a causal chain that is not easy to translate into mathematically or otherwise simplified models (Weber & Johnson, 2009). These findings indeed confirmed this notion. In the original model 59% of the individual differences in the quality of MDM processes and outcomes were unaccounted for by the causal direct and indirect effects of cognitive ability, self-efficacy beliefs and social self-confidence. Deleting the contribution of cognitive ability and social self-confidence shows that approximately 85% of the individual differences in the quality of MDM processes and outcomes were subsequently unaccounted for. This suggests that the prediction of individual differences in the quality of MDM processes and outcomes in this study was substantially attenuated by the inclusion of the distal individual differences, cognitive ability and social self-confidence as well as self-efficacy beliefs.

The researcher argued that individuals seldom approach decision making with a state of detached affect in making choices that implicate their own interests. In effect, the coexisting
and ubiquitous nature of decision-generated affect becomes even more pronounced in higher stakes decisions as a mediating influence on the volitional deployment of attentional resources. Further, this undermining response of managers is inherently conditional on the independent and combined contributions of individual variables and their internal attributions of their self-efficacy beliefs (i.e., cognitive appraisal of decisional demands, regulation of attentional resources and decision-generated affect) that combine to influence the quality of MDM processes and outcomes. The findings thus offered evidence of self-efficacy beliefs’ commonality with the distal individual variables and their mediating effects as determinants of the intentions and direction of managerial decision behaviour.

**Summary**

This study sought to evaluate the hypothesized causal relationship linking the distal individual variables and the proximal influence of self-efficacy beliefs with decision-generated affect and the allocation of attentional resources as mediators of the intentions and direction of managerial decision behaviour. SEM was chosen as the data analysis strategy of choice because it is suitable to testing an entire system of direct and mediated relations in this proposed causal structure, not just the contribution of isolated predictors.

As the univariate normality of the indicator variables was rejected in the case of 12 of the 18 indicator variables and the null hypothesis of normality for multivariate normality was also rejected, the researcher chose robust maximum likelihood (RML) estimation to fit the measurement and structural models. The evaluation of the measurement part of the model preceded the detailed evaluation of the structural part of the model, where the measurement model via CFA was assessed first in order to confirm that the measurement of each latent variable was psychometrically sound. The tentative evaluation of the measurement model enabled the researcher to maximize the interpretability of the final structural model. The CFA findings failed to find support to satisfactorily confirm an adequate measurement of allocation of attentional resources. The inter-construct relations were also inconsistent with expectations. Evidence for convergent validity proved that this latent variable was harming the model and threatened the integrity of the analysis of the hypothesized structural relations in the proposed model.
Taking cognizance of this fact the researcher retained the offending indicators knowing full well that a poor structural model fit might be due to failure in the operationalization of this specific latent variable. After an admissible solution of parameter estimates of the structural model was obtained, the composite model reliability of the 6-factor latent variable model revealed a respectable multi-factor internal consistency. The proposed structural model was subjected to further scrutiny by way of a spectrum of goodness-of-fit statistics. Absolute goodness-of-fit statistics results revealed a highly significant result that implied that the model was not adequate and the null hypothesis that the structural model fits the population data was subsequently rejected.

The researcher applied power associated with a test of close fit where the null hypothesis was that the model has a close, but imperfect fit in the population. It was found that the probability of rejecting the null hypothesis of exact fit under the true condition of close fit was high and that there might be a high chance of rejecting a good fit of the structural model given the sample size used. The researcher proceeded to evaluate the theoretical relationships of the proposed structural model to see whether they were supported by the data. The consistency, magnitude and significance of the parameter estimates ($\beta_i$ and $\gamma_i$) depicted coefficient estimates that supported the statistical hypotheses as formulated.

The next chapter discusses the results obtained from this study. The conclusions follows in the Chapter after that.
CHAPTER EIGHT

DISCUSSION

This chapter aims to discuss the results by connecting them with the original objectives of this study, as well as the theory and research used to support the arguments of the study. The central thesis in this study is that decision making is a behavioural expression of choice (or intention to choose) one course of action over others. Decision making is a central feature of managerial work and, despite an abundance of conceptual research, there is insufficient empirical evidence to confirm how managers apply decision making processes in order to make choices in the service of both individual and organizational goals. Managers make decisions in real life business contexts facing challenges that are very different to those faced by individuals in laboratory settings. Although individual decision making reflects a reasonable commonality with MDM, the absence of a coherent and adequate theoretical framework has contributed to slow progress in understanding MDM.

The authoritative viewpoints of previous researchers provided for the conceptual underpinnings and theoretical rationale of the relevant constructs in the present research in order to formulate a plausible conceptual model of relations in MDM. The present researcher adopted social-cognitive theory as a plausible framework towards understanding MDM as a function of the individual variables of the manager as the decision maker, as well as the behavioural expressions of choice. Such a dynamic perspective accounts for the stream of behaviour that integrates context, multiple goals, individual variables and the selection of decision processes adopted in MDM. By ordering the theoretically relevant constructs, MDM is presented as a causal chain of influences that take time to exert their influence via the mediating influence of temporal processes (decision-generated affect and allocation of attentional resources) that impact on the quality of MDM processes. Based on a priori selection of the distal and proximal individual differences to proximal predictors (self-efficacy beliefs), the present researcher put forward a conceptual model of time-ordered influences that exert their influence on MDM. It was argued that such a coherent theoretical framework meets the current lack of knowledge of MDM in a parsimonious manner.
Chapter Five demonstrated the operationalization and psychometric evaluation of validated and custom-designed, domain-specific measures pertaining to the present research. The exploratory analyses that followed demonstrated that the measures had identifiable and interpretable parsimonious factor structures that were encouraging and in keeping with the literature and empirical research. Further, the reliability estimates demonstrated encouraging results that suggested that the operational measures largely succeeded in providing both a comprehensive and empirical grasp of the constructs as defined. Further, one-way ANOVA analyses also revealed no significant difference between black and other managers across the pilot samples used to validate the operational measures. On the whole, these custom measures revealed small differences between the groups evidenced by small effect sizes. The evidence suggested that these measures could be applied with confidence in further studies.

Extant research findings using students may not generalize or be equivalent to managers decision makers. Students may not be ideal surrogates for managers since empirical findings may not generalize to managers. The present researcher was able to overcome this limitation. The sample of the present research is reflective of actual managers (mean age of 38.9 years, SD of 7.49). Most managers were postgraduates (77%) with black (15.8%) and women (30.1%) managers represented. Most managers (60%) occupied positions that entailed the management and coordination of divisions or business units at a senior or executive level. In these positions they are required to analyze opportunities and macro-economic factors within a national business or international context.

This study sought to evaluate the hypothesized causal relationship linking the distal individual variables and the proximal influence of self-efficacy beliefs with decision-generated affect and the allocation of attentional resources as mediators of the intentions and direction of managerial decision behaviour. SEM was chosen as the data analysis strategy of choice because it is suitable to testing an entire system of direct and mediated relations in this proposed causal structure, not just the contribution of isolated predictors.

*Discussion of Results*

The evaluation of the measurement part of the model was assessed first in order to confirm the interpretability of the final structural model. The CFA findings failed to find
support that satisfactorily confirmed an adequate measurement of allocation of attentional resources. The selection of operational indicators to represent the allocation of attentional resources as a latent variable suggested that they were more likely representing different underlying latent variables or that the allocation of attentional resources represent a multidimensional construct that may incorporate negative affect, threat-oriented cognitions and avoidant preferences.

The interconstruct correlations demonstrated evidence of discriminant validity. Self-efficacy beliefs and cognitive ability were empirically independent. This empirical independence of cognitive ability and self-efficacy beliefs underscores self-efficacy beliefs as a proximal task-specific motivational construct to act as a threshold variable that determines whether individuals choose to deploy their available attentional resources. Cognitive ability and social self-confidence traits were empirically distinct and in accordance with previous empirical findings. Self-efficacy beliefs displayed a positive relationship with the quality of MDM processes as was expected. Social self-confidence (i.e., confidence and willingness to engage in social influence) showed a positive linear relationship with MDM and also displayed a positive linear relation with self-efficacy beliefs. This was in accordance with the view that generic self-efficacy beliefs (i.e., confidence) and domain self-efficacy beliefs are not entirely independent. Moreover, social self-confidence was also independent from cognitive ability but related to self-efficacy beliefs.

Cognitive ability (i.e., upper level of available attentional resources capacity) and self-efficacy beliefs displayed a negative relationship with decision-generated affect and the volitional allocation of attentional resources. Decision-generated affect is relevant for the allocation of attentional resources. Negative affective self-reactions divert attentional resources away from effortful cognitive and interpersonal information collection, deliberation, influence and negotiation, in order to minimize threat and conserve attentional resources. The interconstruct correlations confirmed this and provided confidence that they were related in a manner that supported the theorizing in the proposed model of relations in MDM.

Subjecting the structural model to further scrutiny by way of a spectrum of goodness-of-fit statistics, revealed that the model was not adequate and the null hypothesis that the model fits the population data was subsequently rejected. It was sensible to assess the degree of lack of fit of the model with reference to further measures. The model was compared to a model
with a sample of \( N < 250 \), with 12 to 30 measured indicators, which requires a RMSEA of < .08, a CFI of .95 or better, and a SRMR of .08 or less. The smaller than .08 value of RMSEA of the structural model indicated a reasonable model fit. The CFI compared the goodness of fit among several models and an unsatisfactory model fit was indicated by a CFI of .87. Finally, the SRMR value was not higher than .10 at .09. On the whole, these findings suggest the possibility of a more elaborate model. Further, the poor evidence found for convergent validity of the measured indicators for the latent variable (allocation of attentional resources) made it difficult to rule out the possibility that the poor structural model fit was due to inherent structural flaws but rather to shortcomings in the operationalization of this latent variable.

There was some confirmation in accordance with extant theory and previous empirical findings (see for example, Ferris et al., 2005; Hochwarter et al., 2006; Judge et al., 2007; Kolodinsky et al., 2007; Schmidt et al., 2008; Sullivan et al., 2003; Wayne et al., 1997). Cognitive ability and social self-confidence demonstrated jointly accounted for 27% of the variance in decision-generated affect. The direct effect of decision-generated affect also showed a significant beta weight on the allocation of attentional resources. Further, the indirect effect of cognitive ability and social self-confidence on the allocation of attentional resources was also significant.

Of specific importance to this research was the fact that the contribution of self-efficacy beliefs was less prominent in the presence of cognitive ability. Removing cognitive ability and social self-confidence as influences in the original structural model reduced the causal direct and indirect influence of self-efficacy beliefs on the quality of MDM processes and outcomes. This suggested that estimates were greater for cognitive ability than for both self-efficacy beliefs and social self-confidence in MDM. By and large, these findings echo previous empirical research. A plausible argument is that the incremental validity of cognitive ability is stronger when compared to distal personality traits and the proximal influence of self-efficacy beliefs when individuals are faced with broader and complex decisions. Consequently, the contribution of self-efficacy beliefs as determinants of the intentions that shape the decisional behaviour of managers could be smaller for high cognitive ability individuals but larger for low cognitive ability individuals (i.e., implying an interaction effect).

Self-efficacy beliefs and other constructs vie for predictive supremacy in many studies of performance and the present study was approached in order to offer evidence of self-efficacy
beliefs’ commonality with other determinants and its mediating effects on managerial decisional behaviour. In this regard, Bandura (1984, 2008) argues that commonality of mechanisms should not be confused with exclusivity of mechanism. Accordingly, the aim of this study was not to suggest that self-efficacy beliefs will “upsurp the lion’s share of the variance in human conduct” (Bandura, 1984, p. 252). When these other determinants are controlled for, self-efficacy beliefs do prove to contribute to individual differences in MDM processes and outcomes.

The next chapter discusses the theoretical and practical contributions of the present research as well as the research’s limitations and recommendations for future research.
CHAPTER NINE

CONCLUSIONS AND RECOMMENDATIONS

In the absence of a coherent and adequate theoretical framework of MDM the present researcher formulated a conceptual model of relations that reflect the constellations of theoretically relevant individual factors and their time-ordered influences on the allocation of attentional effort and the subsequent quality of decision processes and outcomes. As a psychological process MDM is defined as the manner in which managers construe the decision making context that influence the engagement and allocation of attentional resources that give rise to the volitional selection of cognitively effortful decision strategies to a course of action in order to satisfy multiple goals in MDM.

After reviewing the large corpus of empirical findings empirical research on MDM was found to be limited and empirical knowledge on managers as decision makers remains scarce. Using scattered empirical findings across laboratory and field settings, the researcher was able to extract useful empirical generalizations that guided the formulation of a conceptual model of relations in MDM. Moreover, the utility of a social cognitive approach was adopted to examine the interdependencies and cumulative effects among individual factors and affect as a temporal motivational processes that bear on the construct of MDM.

These conceptual and empirical underpinnings culminated in a conceptual model of relations represented by the series of specific causal paths linking individual variable factors (distal influences) and self-efficacy beliefs (proximal influences). The single and primary aim of the study was to establish the postulated ordering of these causal paths linking individual variable factors (distal influences), self-efficacy beliefs (as proximal influences) and temporal processes as a whole, as a plausible model to account for individual differences that influence the engagement and allocation of attentional resources that give rise to the selection of cognitively effortful information search, deliberation and rational social influence in MDM.

This chapter discusses the general conclusions that derive from the results and discussion as presented in Chapter Five, Seven and Eight. This will be done by connecting these results with the original objectives of this study, as well as the theory and research used to support the arguments for the study. The conclusions also include the practical implications and recommendations for future research of this type of investigation.
In order to establish whether this proposed model provides a plausible explanation of the specific paths or a postulated ordering of causal paths as proposed (as illustrated in Figure 5.2) the following research questions were investigated:

- Does the proposed model offer an adequate empirical fit that might provide adequate goodness-of-fit to the sample data?
- Do cognitive ability, self-efficacy beliefs and social self-confidence independently account for the prediction of decision-generated affect in MDM?
- Does decision-generated affect and the allocation of attentional resources as temporal processes mediate the quality of MDM processes and outcomes?

The first subsection of this chapter summarizes the findings of the EFA in order to operationalize the latent variables and to identify an understandable and interpretable parsimonious factor structures associated with each of the latent variables. This is followed by a summary of the CFA results used to verify the psychometric quality of the measurement model, the magnitude of the relations and independence between latent variables in the proposed model.

The Factorial Structure of MDM in the current study

The exogenous variables (i.e., cognitive ability and social self confidence), synonymous with independent variables, have been previously operationalized and used in studies performed in other contexts. A pilot study was employed to determine the factor structures of the dimensionality and internal consistency of the custom designed indicator measures that were employed as endogenous, dependent variables in this study. An exploratory approach was followed to operationalize the endogenous latent variables and EFA identified understandable and interpretable parsimonious factor structures associated with each of the endogenous latent variables under consideration. Further, the external construct validity, by way of both convergent as well as discriminative validity, of the custom-designed scales provided a degree of trust in their psychometric properties and succeeded in providing an empirical understanding of the constructs under consideration in keeping with the literature and empirical research. Reliability estimates also confirmed a degree of trust in the indicators’ properties in providing
an uncontaminated measure of the defined constructs. In addition, each of the measured indicators and their associated factor structures, were structurally equivalent for the major ethnic groups in the current study. The present researcher concluded that these population groups had similar interpretations of the latent variables used in the subsequent analyses of the current study. The distributional characteristics of the majority of the measured indicators however violated the assumptions of univariate normality and the high levels of leptokurtosis were noteworthy. This suggested that the distributions might reflect the idiosyncrasies unique to the specific sample which was particularly troublesome in this study.

The proposition that a valid, reliable and interpretable factor structure for each of the identified latent variables existed was, on the whole, supported but not without some concern. The measured indicators based on the initial EFA in the pilot study (as highlighted in Chapter Four) provided better levels of fit than that of the subsequent CFA in the main study. Noteworthy was the failure of the selected indicators in their representation of two latent variables, namely, allocation of attentional resources and the quality of MDM processes and outcomes. The low loadings for the latent variable, allocation of attentional resources suggested that the selected operational indicators failed to provide an adequate empirical grasp to reflect this latent variable adequately because more than half of the variance for the specified indicators was not accounted for by the allocation of attentional resources. In addition bargaining and procedural rationality also displayed low loadings on the quality of MDM processes and outcomes.

As unidimensionality means that a set of measured indicators has only one underlying fit on a single-factor, this failure of unidimensionality suggested that the measured indicators were more likely representing a complex multi-dimensional construct and, consequently, increased the likelihood of problems with interpretational confounding. Although both fatigue and decisional procrastination represented volitional allocation of attentional resources, the former might reflect an aversiveness (i.e., conservation) to allocate attentional resources, whereas the latter might reflect threat-orientated affect (i.e., an avoidance) toward allocation of attentional resources. Despite the poor evidence for convergent validity the offending measured indicators were however retained given that the possibility of the inherent structural flaws in the operationalization of this latent variable might be harming the model and that the analysis of the hypothesized structural relations might be threatened.
Based on the empirical findings the following subsection outlines the viability of the proposed model of plausible constellations of associations and causal relationships that bear on individual differences in the quality of decision processes and outcomes in MDM.

The Viability of the Proposed Model

The present researcher set out to test the structural model motivated by an attempt to capture, in an equation structure, the hypothesized causal relationship linking the distal individual variables and the proximal influence of self-efficacy beliefs and mediating influences on the intentions and direction of managerial decision behaviour. SEM was adopted as the data analysis strategy of choice as implemented in AMOS 17.0 for Windows (Arbuckle, 2008) and EQS 6.1 (Bentler, 2006). By considering all the relationships among the latent variables simultaneously in estimating parameters, SEM enabled the researcher to test the hypothesized relationships among the latent variables and to estimate the unique contribution of each latent variable in the structural model. EQS was valuable in the sense that it is the only program that offers the Satorra-Bentler scaled $\chi^2$ and residual-based tests (Yuan-Bentler Residual-Based Test Statistic and the Yuan-Bentler Residual-Based F-Statistic) as the most accurate method for dealing with non-normal data.

The spectrum of indices of goodness-of-fit statistics suggested that the model was not empirically valid in that the structural model did not fit the population data. Given the known sensitivity of absolute fit statistics to sample size, a wider range of fit statistics was utilized in order to evaluate the degree of lack of fit of the structural model. Benchmarked against a sample of $N < 250$, with 12 to 30 measured indicators, the structural model was acceptable to mediocre with a RMSEA of $< .07$, a CFI of .87 and a SRMR of .09. Furthermore, the structural model was less likely to cross-validate across samples of the same size from the present population. Finally, in order to ensure a thorough assessment of the fit of the structural model, the standardized residuals pointed to an overestimation of the covariance between the observed variables which could be remedied through pruning some of the paths. The researcher subsequently investigated the modification indices for possible model modification. This investigation revealed the existence of a number of correlated errors that suggested the possibility of an alternative, more elaborate nested model that might contain a number of additional paths. With no clear and convincing theoretical argument these hypothesized
additional pathways were problematic to explain and the researcher consequently refrained from any modifications because such actions are inconsistent with the theoretical basis of SEM.

Finally, the discriminability between the latent variables and the extent to which each latent variable was truly distinct from other latent variables demonstrated that they were related to one another in a manner that supported the proposed model. Moreover, the standardized regression coefficients indexed the magnitude of the causal effects between the endogenous and exogenous latent variables as conceptualized.

The present researcher set out to test a theory in an attempt to capture the causal processes and the interrelations among the variables as conceptualized in MDM. It is generally acknowledged that most models are useful approximations that do not fit perfectly in the population and the power of statistical hypothesis testing is to eliminate from consideration those models that are inconsistent with the available data. Detecting an underlying disagreement between theory and data is however controlled largely by the size of the sample. In a very large sample, small and unimportant departures from the null hypothesis are almost certain to be detected (Cochran, 1952). The small samples tests will show that the data are not significantly different from theory. If the sample is large, the test will show that the data are significantly different from those expected on a given theory even though the difference may be so slight as to be negligible or unimportant on other criteria (see, Gulliksen & Tukey, 1958). Consequently, whether any particular model truly reflects a causal process is hard to determine and cannot be done on the basis of empirical results alone, but hinges on placing a proposed model into a larger conceptual framework (Arbuckle, 2008; Bentler, 2006). At a minimum, key variables of relevance to the structural system must not be omitted, error of measurement must have appropriately been taken into account by the use of latent variables, and conditions and times of measurement must have been correctly specified to permit obtaining the hypothesized effects.

The next subsection describes the theoretical contribution of the study.

**Theoretical Contribution of the Study**

A contribution of this study is that individual differences are valuable partners for theoretical accounts of MDM. A descriptively adequate and parsimonious understanding of the constellations of individual variables underlying MDM is important and an integral part of
decision making research. Bandura (1999) argues that the influence of individual variables on human functioning is often insufficiently recognized and various authors have called for more research on the degree to which individual variables and proximal self-regulatory skills in concert influence work behaviour (see, for example, Kanfer & Heggestad, 1997). Despite their theoretical and practical importance, Haleblian et al. (2004) observe that individual variables have largely been unexplored within decision making research and such a failure to elucidate what constellations of individual variables are jointly necessary in the decision making of managers has been a serious impediment to the progress and understanding of MDM.

For theory development purposes, a focus on the temporal properties of decision behaviour leads to an understanding of what a decision maker intends to do. Estimations of the causal nature of individual variables and their impact on temporal processes can aid as building blocks of theory development (e.g., Schmidt & Hunter, 2004; Klein & Zedeck, 2004). This study offers evidence to suggest that distal individual variables (i.e., cognitive ability and social self-confidence) exert their combined effects indirectly on individual differences in the quality of MDM processes and outcomes as mediated by temporal processes (i.e., decision-generated affect and allocation of attentional resources).

The absolute and relative incremental contribution of self-efficacy beliefs were, however, less prominent in the presence of distal individual variables. Moreover, the estimates were greater for cognitive ability than for both self-efficacy beliefs and social self-confidence as causal influences in the prediction of the quality of MDM processes and outcomes. By and large, these findings accord with related empirical research that proximal self-report estimates and affect accounted for a small amount of variance in performance (Ackerman et al., 1995; Judge et al., 2007; Schmidt et al., 2008). One possibility of this finding may be due in part to the way in which social self-confidence, as personality traits and self-efficacy beliefs, were measured. Both measures were self-report measures and Viswesvaran and Ones (2000) have pointed out that the coefficient alpha reliability of self-report measures is usually reasonably large and may overestimate the reliability because they do not take into account transient measurement error (variations in responses from day to day due to changing moods or other transient psychological states unrelated to the constructs being measured (Schmidt, Le, & Ilies, 2003).
Other than testing the causal paths that focus on the degree to which self-efficacy beliefs mediated the effects of distal individual variables, the present study included the unique relationship of self-efficacy beliefs in combination with cognitive ability and social self-confidence as distal individual variables. Further, the findings do not suggest that personality traits and self-efficacy beliefs have no utility. The present researcher pointed out that MDM is over-determined and embedded in a rich nomological network that contains numerous antecedent and/or consequential variables. For theory development purposes, an accurate calibration of the absolute and relative sizes in isolation and in conjunction with one another provide evidence for the relative independence or communality of the various constructs for the purposes of predicting managerial decision behaviour.

Although personality and social traits are considered to be proportionately less important than cognitive ability in MDM, the findings suggest that they are not subsumed by cognitive ability and that these traits make an incremental contribution to the quality of MDM processes and outcomes. The convergence and values of variance-extracted of the measured indicators confirmed the criterion space of MDM as grounded in high information-processing demands and complex social encounters. MDM was confirmed as a dual, multifaceted process, i.e., a cognitive problem as well as the application of a rational mode of social influence in accordance with conceptual and empirical research. This confirmed that MDM requires empirically distinct and independent individual variables (i.e., cognitive ability and social self-confidence personality traits).

In addition, the evidence suggested that when the effects of distal individual variables (i.e., cognitive ability and social self-confidence) are removed, self-efficacy beliefs mediated the temporal processes (i.e., decision affect and allocation of attentional resources) to account for individual differences in the intentions and direction of managerial decision behaviour. The underlying premise of self-efficacy beliefs is self-regulation of behaviour by cognitive, affective and motivational processes (Bandura, 1997, 2001) that determine their affective reactions, how much effort (i.e., allocation of attentional resources) they will expend and how long they will persevere when confronting obstacles in the face of adverse situations. Self-efficacy beliefs were operationalised as a multidimensional construct as the exercise of personal control over affective outcomes by thought (creating an attentional bias which determines whether events are construed benignly or as emotionally perturbing) and action
(regulating affective states by supporting effective courses of action). The findings were in accord with previous empirical evidence that demonstrated that mediating influences as bearing on managers’ internal attributions of their decision making competence.

The evidence also suggests that cognitive ability and social self-confidence (as well as self-efficacy beliefs) have an effect on the quality of MDM processes and outcomes through multiple pathways. The relatively small incremental contribution of self-efficacy beliefs may have been suppressed by the inclusion of cognitive ability as a suppressor variable. A suppressor variable is one that, when partialled out of another measure, increases the other measure’s validity or regression weight by ‘suppressing’ or partialling out invalid components of the first measure. Such suppression effects are common in complex models according to Cohen et al. (2003). Consequently, despite the hypothesis that higher self-efficacy beliefs caused an increase in decision-generated affect, such increases in affect could also have caused a change in cognitive ability (e.g., increased effort). Thus, self-efficacy beliefs may interact with cognitive ability such that high self-efficacy beliefs are especially beneficial for individuals with high cognitive ability and that the estimate of a causal effect of self-efficacy beliefs may be conditional on the level of cognitive ability as a moderator in the model.

The causal process represented in the structural model is highly consistent with goal theory and adds importantly to it by illustrating how decision-generated affect is transformed into goal-directed behaviour. In this model affect acts as information and as an incentive to be comprehensive and rational in decision making (i.e., to meet an accuracy goal) or to minimize decision-generated affect or to save attentional resources (i.e., resort to low-effort and impression motivated heuristics to economize decision processing).

MDM constitutes effortful psychological acts that consume attentional resources. Although the selected indicators failed in their representation of the latent variable, allocation of attentional resources, the researcher alluded to the possibility that this latent variable is likely a multidimensional construct. The present researcher used decisional procrastination and fatigue as indicators yet they did not converge or share a high proportion of variance in common (i.e., convergent validity). Further, the composite construct reliability of .18 also served to confirm weak convergent validity. Parsimony encourages researchers to use the smallest number of indicators to adequately represent a latent variable and the researcher was faced with a dilemma in deciding how many indicators were needed to provide an empirical
grasp in order to represent the allocation of attentional resources and still maximize reliability. More indicators require larger sample sizes and can make it difficult to produce truly unidimensional latent variables factors and increase the likelihood that artifact factors will be produced. The fact that the researcher has used only two measured indicators may not have captured the multidimensionality of attentional resources and may have increased the infeasible solution.

In spite of this, the study suggests that choice aversion as a function of allocation of attentional resources may not in fact be a unitary construct. Weber and Johnson (2009) note, in this regard, that although individuals are restricted by finite attentional capacity they are also blessed by an abundance of ways in which they can focus and utilize this finite capacity. These ways extend from goals to processes, one of which is to adopt an aversive stance to choice via one of several avoidant patterns (Anderson, 2003, 2007). These patterns are all however subsumed by the volitional allocation of attentional resources as a higher order construct. Volitional processes determine whether or not an intention to act is fulfilled (Kuhl, 1987) and the attentional allure of off-task concerns or affective events can present a great challenge to individuals’ ability to regulate task-focused attention (Weiss et al., 2005). Consequently, volitional acquiescence to deploy attentional resources can provide the conceptual framework to study managers’ willingness to act on the opportunity-affording features of a decision or favour aversion and avoidance to choice. These findings may advance what Frost and Shows (1993, p. 683) noted: “almost all of the work on indecisiveness has been theoretical or descriptive” and that “further research on the nature of indecisiveness is warranted”.

As was pointed out in Chapter Three there are no studies that have investigated a comprehensive model that includes cognitive ability, personality traits and self-efficacy beliefs in managerial samples and MDM (Hiller & Hambrick, 2005). This study is the first to investigate the relative independence or communality of distal individual differences and self-efficacy beliefs as co-determinants of the quality of MDM processes and outcomes using actual managers.

Other than a theoretical contribution, the study aids in both heuristic and applied utility. The work of managers is becoming more global and requires them to adjust to challenges in multi-cultural and multi-national settings. The nature of self-efficacy beliefs as a construct suggests that it is configurally equivalent across countries (see, for example, Sadri, 1996;
Schwarzer, 2002; Scholz, Dona, Sud, & Schwarzer, 2002) which thus substantiates it as universal and relevant to the study of MDM.

**Practical Utility of the Study**

Bandura (1984) asserted that human behaviour is multiply determined and its understanding and explanation require an appreciation of the interplay among the determinants that act as common mechanisms of personal agency. Commonality of mechanism, Bandura cautioned, should however not be confused with exclusivity of mechanism. The present researcher approached this study not to suggest predictive supremacy of self-efficacy beliefs but to illustrate their communality and as a co-determinant of the ‘will-do’ as opposed to the ‘can-do’ aspects of managerial decisional behaviour.

The findings have important implications for understanding and theory construction and also for practical applications in employment selection (see, for example, Maertz, Bauerb, Mosley, Posthumad, & Campion, 2005). In applied settings, thorough assessment of individual differences in cognitive abilities is often excluded for a variety of reasons. Personality trait predictors may provide a useful partial proxy for such assessments when ability data are unavailable. However, as shown in this study, such proxy measures may introduce systematic, non-performance-related variance into the equation.

Decision making is arguably the most critical component of a manager’s job, and flawed decision making processes and outcomes decide the fate of their organizations with consequential outcomes. Competence in decision making is not synonymous with performance. The multidimensionality of performance in MDM is influenced by a number of factors, including individual ability and stable personality traits internal to an individual (e.g., knowledge and skills), external factors (e.g., contextual factors), and transitory factors (e.g., proximal task and context influences). In most instances, managers undertake the decision process in a context of competing goals and objectives, together with information overload—conditions that greatly exceed individuals’ cognitive (attentional resources) capability, the very conditions that evoke affect as by-products of the decisional process. This makes managers most vulnerable to the volitional deployment of effort precisely when they are extended to deal with such demands.
Cognitive ability, personality traits and proximal (task-situation specific) motivational constructs, particularly self-efficacy beliefs should consequently be used to identify individuals who can perform in such roles (see, for example, Chen et al., 2000; Ferris et al., 2001), deal with high levels of accountability (e.g., Hochwarter et al., 2007), manage work stressors (e.g., Schaubroeck & Merritt, 1997), and cope with role overload (e.g., Brown et al., 2005). In this regard, Beal et al. (2005) assert that, although assessments of stable levels of cognitive ability have been exceedingly successful in selecting better performing individuals, the ability to regulate behaviour and attention represents a set of abilities that is relatively untapped in the realm of personnel selection. The DMSEQ developed for this study may prove useful in this regard.

Further, in spite of their relative small incremental contribution to MDM, one advantage of self-efficacy beliefs is that they are relatively malleable contextually situated patterns that are relatively easy to change (Chen et al., 2000; Kanfer 1996; Kanfer & Ackerman, 1996; Kanfer & Heggestad, 1997). Changes in self-efficacy beliefs and performance show self-corrections where individuals defer to actual performance as a stronger predictor of confidence for future performance (McNatt & Judge, 2004; Richard et al., 2006; Shea & Howell, 2000; Vancouver et al., 2002; Vancouver et al., 2001). Given appropriate cognitive ability, successful performance is often as much a matter of beliefs in capability (Wood & Bandura, 1989a) and when individuals believe that their competence is dynamic, malleable, and able to be developed (an incremental theory), they tend to focus less on fixed ability and traits and appreciate outcomes and actions in terms of more specific behavioural or psychological mediators (Dweck, 2006; Dweck & Molden, 2005; Elliot & Dweck, 2005; Kanfer & Ackerman, 2005; Wood & Bandura, 1989a). Consequently, measures of self-efficacy can help practitioners predict pretraining motivation, tailor specific coaching or training programmes, and moderate the influence of training interventions (see, for example, Bandura, 2000; Kanfer & Heggestadt, 1997; Stajkovic, 2006; Stevens & Gist, 1997).

Limitations and Recommendations

In interpreting the findings of the present study, it is important to recognize the limitations of the design and methods. Primary among these is the cross-sectional and
retrospective nature of the study. As an *ex post facto* study, the variables of interest in this study did not provide an opportunity to manipulate the variables. Demonstration of causality is a logical and experimental, rather than statistical, problem since causality can only be addressed via appropriate design. Further, as data collection was cross-sectional it cannot rule out cohort effects. Moreover, individuals respond to measures at just one point in time and, given the subjective nature of some of the measures, it was possible that individuals might respond differently at a different time or context. These are the exact arguments Vancouver et al. (2001) and Vancouver et al. (2002) used to argue that an over-reliance on cross-sectional, correlational designs might mask the complexity of the proposed relations in the model.

An additional limitation was the fact that 4 out of 6 of the latent variables employed two measured indicators. Hair et al. (1998) note in this regard that three is the preferred minimum number of indicators and as a practical matter five to seven indicators should represent most latent variables adequately. Further, given some of the communalities and that the model included some under-identified latent variables (fewer than 3 measured indicators) constructs, Hair et al. (2006) propose a minimum sample size of 300 or more to recover population parameters. With SEM being a large sample technique, Savalei and Bentler (2006) suggest a rule of thumb of at least 10 observations per measured indicator. The present researcher used 18 measured variables and the sample was 196. Nevertheless the conclusions drawn from the model based on the sample may not be fully trusted. Also, given the goal to estimate the plausibility of the model of relations in MDM the researcher was faced with data from a restricted managerial population in an attempt to estimate parameters of the unrestricted managerial population using a sample of managers nominated for assessment (a restricted sample). Consequently, findings may be due to a type of range restriction, based on a ‘selecting-out’ process, which was not accounted for in the present study.

The present researcher treated the discrete negative anticipated and immediate affect as indicators of a higher order affective construct, that is decision-generated affect. Although the aggregation was psychometrically justified, it may have obscured the actual subjective experiences associated with the particular discrete affective reactions. Subjectively experienced decision-affect remains difficult to capture (see, for instance, Judge et al., 2006). The present researcher used a self-description of experienced affect in order to assess individuals’ subjective context-specific appraisals of their competence and affective reactions. This
retrospective nature of measurement may have resulted in a form of self-generated validity in which responses to one part of the scale were reactive to earlier self-reports of personality traits in spite of being administered in a temporal order. Further, individuals might have only limited awareness of their true decision-affect, or they might have reported affective reactions they believed the researcher wanted them to experience. The results of this measure may thus have been inflated by common sources of variance. To address this, Roseman and Evdokas (2004) propose supplementing self-reports with other sources of information about affective reactions, such as facial expression and physiological measures. A useful methodology to consider is experience sampling methodology (ESM). ESM is a type of repeated data collection method in which individuals provide in situ reports of their experiences over a period of time (Beal & Weiss, 2003). This enables information that assesses the influence of decision-affect at the point in time when it occurs. ESM combines the ecological validity of naturalistic behavioural observation with the precision of scaled questionnaire measures. For example, Foo et al. (2009) used a cell phone-based ESM in order to monitor entrepreneurs’ positive and negative decision-affect in real time (see also, Bono, Foldes, Vinson, & Muros, 2007; Fisher, 2000; 2002; Fisher & Noble, 2004).

Finally, this study demonstrated that MDM is much more than reason-based decision behaviour. It offers an abundance of additional research problems in order to understand the largely neglected influence of the temporal order of ‘hot processes’ for the deployment of effort to be comprehensive in decision making or to resort to low-effort heuristics and economize processing (i.e., save or conserve attentional resources). To this end, Beach and Connolly (2005) conclude that this abundance of problems suggests that it is a good time to be working in this discipline, the enterprise is exciting and fun, it is worthwhile and the future looks bright.
REFERENCES


APPENDIX I

Date

Dear

You are being asked to participate in a research study. We are going to give you information that will help you to understand the study, and what you will be asked to do during the study, the risks and benefits, and your rights as a study subject. If anything is not clear to you, please ask the researcher to explain.

I am currently registered at the Nelson Mandela Metropolitan University and conducting research on managerial decision making. The aim of this research is to investigate how well experienced managers use decisional skills they possess. The manner in which individuals approach complex decision tasks may be affected by beliefs in their competence that are self-enhancing or self-impeding and the research aims to investigate this notion.

This study has been approved by the Human Ethics Committee of the Nelson Mandela Metropolitan University. This is a group of independent experts whose responsibility it is to help ensure that the rights and welfare of participants in research are protected and that the study is carried out in an ethical manner. The study cannot be conducted without the Human Ethics Committee’s approval. The Human Ethics Committee can also answer any questions about your rights as a research subject.

Your contribution in this research study entails inventorying your views about your own problem solving and decision-making behaviour. Some of the measures we will use for the purposes of this research will be clearly marked “for research purposes only” and will not be used at all for the purposes of the assessment you have been nominated for.

Participation in the research is completely voluntary. You are not obliged to take part in the research. If you choose not to participate, your position will not be affected in any way and you will incur no consequence to which you may otherwise be entitled. Your identity will remain confidential. The results of this research study may be presented at scientific conferences or in specialist publications, but your identity will not be made known.

You will be asked to give your written informed consent to participate by signing and dating a form putting your initials against each section to indicate that you understand and agree to the conditions. You have the right to ask questions concerning the study at any time. You should also immediately report to the researcher any concerns you may have during the administration of these inventories. If you agree to take part, you have the right to change your mind at any time during the course of the assessment. You are free to withdraw this consent and discontinue participation at any time. However, if you do withdraw from the study, you should inform the administrator so that the data collection may be stopped in an orderly manner.
The telephone numbers of the researcher are provided on this letter head. Call this number if you have any questions or concerns about the study.

This informed consent has been prepared in compliance with the Professional Board for Psychology.

Yours sincerely
Wim Myburgh

Industrial Psychologist
Health Professions Council of South Africa
Registration no.: PS0015873
APPENDIX II

INFORMATION AND INFORMED CONSENT FORM

TITLE OF THE RESEARCH PROJECT:

AN EXPLORATION OF MANAGERIAL DECISION-MAKING PROCESSES AND AFFECTIVE OUTCOMES AS A FUNCTION OF INDIVIDUAL VARIABLE FACTORS AND SELF-EFFICACY BELIEFS

NELSON MANDELA METROPOLITAN UNIVERSITY

PRINCIPLE INVESTIGATOR: Wim Myburgh

Supervisor: Prof. M. B. Watson

Co-Supervisor: Prof. C. D. Foxcroft

ADDRESS: 46 Barnet Street, Gardens 8001, CAPE TOWN

CONTACT TELEPHONE NO.: 021 462 4883

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<tr>
<th>DECLARATION BY OR ON BEHALF OF PARTICIPANT</th>
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<td>HEREBY CONFIRM AS FOLLOWS:</td>
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<td>I was invited to participate in the abovementioned research project which is being undertaken by Wim Myburgh of Psymetric in conjunction with the Faculty of Health Sciences of the Nelson Mandela Metropolitan University.</td>
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<td>The following aspects have been explained to me. AIM: The investigator is studying how well experienced managers use their decision skills in complex decision tasks. The information will be used for the Requirements for the degree of Doctor Philosophiae.</td>
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<td>Procedures: I understand that I will be asked to disclose my decision making behaviour and preferences through a series of inventories, exercises and an interview.</td>
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<td>Possible benefits: As a result of my participation in this study I may gain an</td>
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understanding of the influence of my own self-competence beliefs more fully which may help to improve my managerial decision making performance. The findings, if disclosed to me during feedback, may suggest how to achieve this.

Confidentiality: My identity will not be revealed in any discussion, description or scientific publications by the investigator.

Access to findings: Any new information / or benefit that develop during the course of the study will be made available to me should I request this.

My participation is voluntary: My decision whether or not to participate will in no way affect my employment.

1. The information above was explained to by ………………………………

   (name of relevant person) in Afrikaans / English / Xhosa / other ………

   and I am in command of this language / it was satisfactorily translated to me

   by ………………………………… (name of translator).

   I was given the opportunity to ask questions and all these questions were

   answered satisfactorily.

2. No pressure was exerted on me to consent to participation and I understand that I may withdraw at any stage without consequences to me.

3. Participation in this study will not result in any additional cost to myself.

   I HEREBY CONSENT VOLUNTARILY TO PARTICIPATE IN THE

   ABOVEMENTIONED PROJECT.

Signed / confirmed at ………………………………………………………………

On ………………………………… 200……

………………………………………………….. (place)

Signature of participant  Signature of witness
IMPORTANT MESSAGE TO PARTICIPANT

Dear Participant

Thank you for your participation in this study. Should you at any time during the study,

• experience a concern as a result of the research, or

• you require any further information with regard to the study

..............................................................
..............................................................

(indicate any circumstances which should be reported to the investigator) kindly contact Wim Myburgh at telephone number 021-4624883 or at email wim@psymetric.co.za