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Abstract

Researchers have utilised normative, heuristic, and process approaches to understand people’s decision-making but with less focus on how satisfying these decisions are. There is a gap in the literature regarding the contribution of appraisals, stress, coping, and metacognitive awareness and acceptance to decision satisfaction. The conflict approach to decision-making, cognitive theories of stress and coping, and recent developments in cognitive-behavioural therapies may further our understanding of decision satisfaction. A Cognitive-Affective Model of Decision-Making Stress and Satisfaction was developed from the literature and tested in a three-phase longitudinal study. In Phase One (n = 182 adults; $M_{\text{age}} = 40.48$ years; $SD = 12.04$), a modified model focusing on a decision related to participants’ occupation or study was supported. It explained 61% of the variance in participants’ decision satisfaction. In Phase Two (n = 84; $M_{\text{age}} = 39.43$ years, $SD = 11.94$), the model was found to be invariant across a family/relationship decision. In Phase Three (n = 54; $M_{\text{age}} = 39.54$ years; $SD = 12.29$), model replication was not feasible although mean differences in the model’s manifest factors across occupation/study, family/relationship, and physical/mental health decision types were small or not significant, suggesting that the model is potentially invariant across all three decision types. The Cognitive-Affective Model of Decision-Making Stress and Satisfaction has both theoretical and practical implications for clinicians and researchers alike. These implications are discussed together with the thesis’ limitations and avenues for future research.
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CHAPTER ONE

Introduction

Decisions with which people are confronted can range from the ordinary, for example deciding which pair of shoes to buy, to the extremely stressful, such as deciding between different types of cancer treatments or perhaps, no treatment. A number of approaches to understanding people’s decision-making and the factors involved therein have been developed. Early researchers (e.g., W. Edwards, 1953; Ramsey, 1926; Tinter, 1941) utilised a normative approach where they argued that what people decided could be predicted by determining the maximum expected or actual utilities, that is gains or benefits, to be derived from the decision. Later researchers (e.g., Gigerenzer & Todd, 1999; Kahneman & Tversky, 1982; Simon, 1959) utilised an heuristic approach where the focus was on describing the mental processes that lead to how people made a decision instead of predicting what was decided. The normative and heuristic approaches have since been integrated into what might be called a process approach (Evans, 2011). Yet none of these approaches give any consideration to the stress people may experience when faced with making a decision, the coping strategies they employ to reduce this stress, or people’s satisfaction with the decision they make.

Another method referred to as the conflict approach (Balneaves & Long, 1999; Janis & Mann, 1977; Lewin, 1935) developed alongside the normative, heuristic, and process approaches to decision-making. The basic premise in the conflict approach is that decision-making is by nature stressful and that people experience decisional conflict as they are driven to choose between competing alternatives (Janis & Mann, 1976, 1977). Indicators of decisional conflict include feeling uninformed about the available alternatives and unclear about what
alternative is more valued (Balneaves & Long, 1999; O'Connor, 1995). Thus in their view decision-making involves a process of coping with the decisional conflict in order to make a decision that leaves the decision-maker free of post-decisional conflict (Janis & Mann, 1977). The antithesis of what Janis and Mann (1977) termed post-decisional conflict that is the experience of residual decisional conflict following a decision is decision satisfaction. Satisfaction with one’s decision seems at least equally if not more important than determining how one arrived at a decision.

The conflict approach to decision-making has many parallels with the broad body of literature on stress and coping which considered together might further our understanding of the cognitive-affective factors involved when people make decisions. Like decision-making, the concepts of stress of coping have been described in different ways.

Cannon (1932, 1935) and Selye (1950, 1956) focused on stress and coping as responses, Holmes and Rahe (1967) and Sarason, Johnson, and Siegel (1978) viewed stress as a stimulus that involves a certain level of coping or social readjustment, while others have focused on stress and coping as a cognitive process (Hobfoll, 1989; Lazarus & Folkman, 1984). Each of these theories has merit. Although the cognitive theories of stress and coping might be more beneficial in understanding people’s decision-making stress and satisfaction as it is their cognitive appraisal of the need to make a decision (i.e., stimulus) that can lead to decision-making stress (i.e., outcome).

In Lazarus and Folkman’s (1984) cognitive theory of stress and coping, it is people’s appraisal of a gap between the demands of the situation and the resources available to them to meet those demands which predicts the level of stress experienced and the coping strategies utilised. People employ a range of coping
strategies to manage the situation, their thinking or expectations about the situation, or to avoid the situation altogether (J. R. Edwards, 1992). A link between appraisals and the need to meet the demand to make a decision, can also been seen in Janis and Mann’s (1977) Conflict Theory, where it can be said that people appraise the time available and the energy/effort required to facilitate their decision-making. The ultimate goal in this case would be to use coping strategies to reduce decision-making stress and any post-decisional conflict, in other words, to enhance decision satisfaction.

Additional factors that might have an impact on people’s decision-making stress and decision satisfaction can be found in recent developments in cognitive-behavioural therapies (Hayes, 2008; Wicksell, Olsson, & Hayes, 2010). The focus in traditional cognitive-behavioural therapies, such as Beck’s (1976) Cognitive Therapy and Ellis’ (1962) Rational-Emotive Behaviour Therapy, is to change distorted and rigid cognitions to increase people’s psychological wellbeing. More recent therapeutic models, such as Hayes et al.’s (2006) Acceptance and Commitment Therapy, include strategies to increase people’s metacognitive awareness and acceptance. Empirical support for the effect of metacognitive awareness and acceptance on people’s health and psychological wellbeing has been positive (Masuda & Tully, 2012; McCracken, Barker, & Chilcot, 2014; Wicksell, Olsson, et al., 2010), and it might be that such metacognitions are also involved in reducing people’s decision-making stress and enhancing their decision satisfaction.

The aim in this thesis is to develop a model of decision-making stress and satisfaction that integrates the conflict approach, a cognitive model of stress and coping, and recent developments related to metacognitions. This model will be tested in a longitudinal repeated measures study across three separate decision contexts: (1)
occupation/study, (2) family/relationships, and (3) physical/mental health, in order to assess its stability.
CHAPTER TWO

Major Approaches to Decision-Making Research

The platform for contemporary decision-making research was established early in the 20th Century when the influence of mathematics, economics, and behaviourism (Skinner, 1938; J. B. Watson, 1919) were dominant. Early researchers (e.g., Ramsey, 1926; Tinter, 1938) focused on predicting people’s decision-making based on concrete external cues of a purely ‘rational’ and mathematical nature. Later researchers (e.g., Janis & Mann, 1977; Kahneman & Tversky, 1979; Simon, 1959) challenged these rational approaches stating that decision-making is strongly influenced, perhaps even dominated by, one’s cognitions and feelings of decisional conflict. These later cognitive-based approaches were aligned with the “cognitive revolution” of the 1960s and 70s that made the internal states of the decision-maker paramount. In this chapter the theoretical and empirical background to decision-making and decision satisfaction is presented with reference to four significant research approaches: (1) the normative approach, (2) the heuristic approach, (3) the conflict approach, and (4) the process approach. The normative approach to decision-making research is discussed first.

Normative Approaches

Decision-making research during the first half of the 20th Century was primarily prescriptive or normative. Early researchers such as Ramsey (1926) and Tinter (1938) were outcome-focused and therefore concerned more with predicting what people decided, as opposed to being process-focused or concerned with how people arrived at a decision. There was minimal consideration of processes such as the deliberation of options or the use of heuristics. Instead, principles of mathematics and economics were utilised to predict what a person would decide from a range of
given alternatives. The underlying assumption of this normative approach was that people have an inherently rational nature.

Ramsey (1926) aimed to predict people’s decisions using the laws of probability. He argued that people are inherently rational and therefore their decision-making would follow the rational laws of probability. His basic premise was that people make decisions that have the greatest probability of maximising utilities for them, that is, maximising gains or benefits. Ramsey developed a mathematical function he argued could predict the maximum utility or gain associated with any decision and therefore be predictive of what a person will decide. There are two elements, each presented in the form of probabilities, in Ramsey’s maximum utility function: (1) a person’s degree of ‘belief’ in the truth of a given proposition (e.g., “If I choose Option A, then there is a 70% chance of winning $10”) and (2) their degree of ‘desire’ for the utility associated with the proposition when true (e.g., “I will win $10”) or not true (e.g., “I do not win anything”). While degrees of belief and desire today would be inferred as a person’s internal assessments, Ramsey quantified these assessments in terms of external cues such as the money to be won and the probability of gaining that money. Any consideration of internal states of the decision-maker was merely implicit.

Ramsey’s (1926) decision theory was based on the premise that people had access to all relevant information, environmental conditions, and possible outcomes when making a decision. This premise is evident in Ramsey’s conclusion that the total sum of the probabilities ascribed to the degree of ‘belief’ and ‘desire’ within his mathematical function equal one. In order for these probabilities to equal one, there could be no element of risk or uncertainty associated with the prediction of the decision made. Ramsey’s decision theory is also based on the assumption that an
“ideal” decision, that is a decision with which the person will be satisfied, is purely a matter of maximised utilities. Another assumption was that there exists a predetermined “right” decision in each instance that will result in the maximisation of utility.

Like-minded researchers (e.g., Tinter, 1938; Tinter, 1941; Wald, 1939, 1947) aimed to apply Ramsey’s (1926) mathematical function to predicting people’s decisions, but attempts to do so did not develop much past logical and mathematical analyses of the principles involved. Later researchers (e.g., W. Edwards, 1953) who submitted Ramsey’s theory to empirical evaluation found limitations in the application of his theory. W. Edwards (1953) asserted that it is unrealistic to expect that people have knowledge of all possible environmental conditions, all relevant information, and all possible decision outcomes as proposed by Ramsey (1926).

W. Edwards argued that decisions are made under conditions of risk and uncertainty and therefore Ramsey’s mathematical function which was said to maximise utilities, could only ever be a function to maximise expected but not actual utilities that is, gains or benefits. By extrapolation, W. Edwards’ placement of decision-making within an environment of risk and uncertainty meant that Ramsey’s conceptualisation of what made an “ideal” decision, that is the decision with the highest probability of maximising the largest actual utility, could not exist. Rather a “not-as-ideal” decision would be a more realistic way of predicting decision-making in everyday life. Accordingly, W. Edwards’ presented an Expected Utility function that comprised two basic elements: (1) the desire for an expected outcome, that is, the expected utility; and (2) the belief in gaining that expected utility, presented as an expected probability. The decision with the greatest, expected probability that would
result in the maximum expected utility is, W. Edwards argued, what a person would choose.

W. Edwards’ (1953) provided empirical support for his Expected Utility Theory in a series of laboratory experiments. He constructed a series of monetary bets between which a sample of 12 undergraduates were asked to choose. The bets were presented in different ways suggesting different expected amounts of money could be won, but in reality the actual amount of money that could be won was held constant. The results indicated that the participants preferred to choose a bet they expected would have the greatest probability of winning them the greatest amount of money. As no monetary bet would result in a greater win, participants’ betting behaviours reflected their expectations rather than actualities, hence “Expected” Utility Theory. W. Edwards (1954a) replicated this experiment with another sample of eight undergraduates who also preferred to make bets with the greatest expected probability of winning them the greatest amount of money.

Although the small sample sizes and simplicity of the decisions posed limit the generalisability of these findings, W. Edwards (1954b) argued that these results supported his Expected Utility Theory and therefore challenged Ramsey’s (1926) earlier theory on maximising utilities. Despite their differences, W. Edwards (1954b) and Ramsey (1926) both argued that people’s decision-making is rational and that the most satisfactory decision is one that results in the greatest maximisation of utility, whether expected or actual. It was not until later in the 20th Century that Kahneman and Tversky (1979) refuted these assumptions with the development of their Prospect Theory.

Kahneman and Tversky (1979) argued that the decisions people make can be predicted by expected changes to their prospects, which they defined as a person’s
level of perceived wealth (monetary value) and welfare (general wellbeing), relative to their current levels of perceived wealth and welfare. Kahneman and Tversky termed the current levels of prospects as the person’s adaptation level, which would change as decisions were made and outcomes experienced. The goal of any decision therefore is to maximise their decision satisfaction, which in this case, is for people to maximise their prospects of wealth and welfare. A theory which considered relative changes in the decision-maker’s wealth and welfare around an adaptation or base level was in stark contrast to W. Edwards (1954b) and Ramsey (1926) who focused solely on maximising monetary gains. This shift in perspective led to a wider range of decision types that could be explored empirically.

In their drive to provide support for their theory, Kahneman and Tversky (1979) explored the impact of changes in people’s adaptation level by looking at decisions framed not just in terms of expected gains but also in terms of expected losses in prospects. They found that when decisions were framed in terms of possible gains in prospects, participants’ decisions reflected an internal drive to maximise those gains. Likewise, when decisions were framed in terms of possible losses in prospects participants’ decisions reflected a drive to avoid such losses. A drive to make satisfying decisions that maximise expected gains and minimise expected losses is paralleled later in Hobfoll’s (1989) theory of Conservation of Resources. Furthermore, Kahneman and Tversky (1982) found that the drive to minimise expected losses was greater than the drive to maximise expected gains. They also found that people do not always use rational calculations of maximising expected gains and losses, but often utilise decision heuristics which are discussed next.
Heuristic Approaches

Kahneman and Tversky (1982) argued that people’s intellectual abilities and psychological processes can limit their ability to make rational and personally satisfying decisions and as a consequence people use various cognitive-based heuristics or, mental “short-cuts”. They argued that heuristics are intuitive and reflect the use of three specific characteristics: (1) informal or unstructured decision strategies not requiring deliberation or other analytical methods, (2) formal rules consistent with the decision-maker’s personal model of the world, and (3) a decision strategy for everyday choices that does not require conscious cognitive awareness or reflection. An alternative definition from Gigerenzer and Gaissmaier (2011) saw heuristics as a “[cognitive] strategy that ignores part of the information, with the goal of making decisions more quickly, frugally, and/or accurately” (p. 454).

Among the common heuristics acknowledged in decision-making research today are the recognition heuristic, fluency heuristic, and take-the-best heuristic. Goldstein and Gigerenzer (2002) described the recognition heuristic as the cognitive process of making a decision based on information from similar past-experiences cued from long-term memory (i.e., it is ‘recognised’). Schooler and Hertwig (2005) described the fluency heuristic as a cognitive process of choosing the alternative that is first considered the ‘right’ decision (i.e., most ‘fluent’) from all the alternatives that may have been considered somewhat ‘right’. While, Gigerenzer and Todd (1999) described the cognitive process of choosing the alternative that first comes to mind as the take-the-best heuristic, regardless of whether it was logical or the most ‘correct’. The common theme among these and other heuristics is that they contribute to faster information processing using a lesser amount of information than the rational decision-making process argued to be central to the normative
approaches (W. Edwards, 1954b; Ramsey, 1926). While acknowledgement of decision heuristics was a major step forward in this area, researchers (e.g., Simon, 1979) realised that there were bounds to their use.

The use of decision heuristics is dependent on cues from the external environment within a reality which Simon (1979) argued was a bounded rationality. Simon argued that rationality is bounded by risks and uncertainty present in the external environment and by the internal cognitions and perceptions of the person making the decision. The aim of utilising decision heuristics within a bounded rationality was therefore to make as accurate or satisfying a decision as possible (i.e., a good enough approximation) while expending the least amount of time and effort. The process hypothesised to achieve this aim Simon (1959, 1979) termed satisficing.

Simon (1959, 1979) argued that satisficing involves the identification and consideration of various choices according to a personal level of aspiration that changes with each decision option until the person considers their identified choice best meets their level of aspirations. The result of satisficing is a decision that is “good enough”. The level of satisficing applied to a specific decision is largely determined by the decision heuristic selected by the decision-maker, which in turn, is determined by the amount of time and effort required to reach an optimal decision. Later researchers explored further the effect of these motivating factors on the selection of decision heuristics framed in what they termed an ecological rationality.

Payne, Bettman, and Johnson (1988), Gigerenzer and Goldstein (1996), and Gigerenzer and Todd (1999) viewed ecological rationality as the degree of “fit” between the selection of decision heuristics under changing environmental conditions and the desired outcome from the decision in a process of satisficing in order to make a “good enough” decision. Models of ecological rationality include
Payne et al.’s (1988) accuracy-effort framework and Gigerenzer and Goldstein’s (1996) fast and frugal framework. In these frameworks, people are said to utilise a range of decision heuristics to balance the effort, time, and amount of information involved in the decision-making process against whether an optimal and satisfying decision can be made. This balance involves an internal, dynamic mental cost-benefit analysis that is informed by continuously changing environmental conditions and the amount of effort, time, and information required to arrive at what the decision-maker considers an “optimal” decision.

For example, Payne et al. (1988; 1993) found that people initially selected decision heuristics that involved the least effort although sometimes this occurred at the expense of accuracy. In the event that an optimal decision could not be made, participants then adopted decision heuristics that involved more effort in order to increase their accuracy or satisfaction with the decision made. In the event that an accurate or satisfying decision still could be found and the effort expended in the decision-making process surpassed a subjectively appraised “optimal” level, then people returned to using decision heuristics that utilised minimal effort.

In a similar vein, Gigerenzer and Goldstein (1996) found that people initially utilised heuristics to make a decision in what they appraised as the quickest time possible and with the least amount of information needed. They also found that when people were unable to make a “good enough” decision, they resorted to increasingly effortful strategies such as analytical deliberation until an optimal or satisfying decision was made. At all times, the decision-making process was determined by minimising the appraised amount of time and information needed to make a choice. These results support the idea of an interdependent relationship between people’s appraisals and perhaps the impact on their decision-making or decision satisfaction.
The link between people’s internal cognitions and the external environment was made explicit through the exploration of different types of heuristics. Whether heuristic approaches to decision-making research can be integrated with the earlier normative approaches has become a focus of contemporary research (Evans, 2011). Attempts to integrate heuristic and normative models have led to a range of process-focused approaches to decision-making research and are discussed next.

**Process Approaches**

Contemporary decision-making research has focused on the integration of normative and heuristic approaches into a unified process approach to decision-making (Sahlin, Wallin, & Peterson, 2010). The process approach to decision-making is focused on how “Type 1” and “Type 2” processes interact and have an impact on the decisions people make (Evans, 2007). Osman (2004) defined “Type 1” processes in terms of the decision heuristics described in the earlier heuristic theories, such as the fluency heuristic; and “Type 2” processes in terms of the processes implicitly referred to in the earlier normative theories, such as calculating the decision that has greatest expected probability of resulting in the maximum expected utility. This “dual-process” conceptualisation of the people’s decision-making is perhaps the most commonly utilised today (Evans, 2011); however, it does not seem to take into consideration the effects of appraisals, stress, and coping on people’s decisions.

Although various dual-process models exist, Sahlin et al. (2010) argued that they can be categorised broadly into two groups: default-interventionist and parallel-competitive models. In terms of a default-interventionist model, Evans (2007) found that people initially utilise the faster, less effortful Type 1 processes such as decision heuristics (Gigerenzer & Todd, 1999) when faced with having to make a decision.
The use of Type 1 processes is automatic, cued by the external environment, and people’s internal biases and beliefs and these decisions are often unconscious. If a decision is unable to be made, the more time-consuming and effortful Type 2 processes such as mental cost-benefit analyses (Evans, 2007) override, or intervene in, the Type 1 processes to generate a satisfying choice. Evans argued that the intervention in Type 1 processes by Type 2 processes may or may not occur depending on external cues and the individual’s information processing style.

Kahneman and Frederick (2002) found that participants would typically use Type 1 processes first because of their speed and intuitive nature although when needed to help make a decision these could be overridden by Type 2 processes that are slower and more effortful. Handley, Newstead, and Trippas (2011) also found that, depending on external cues, participants’ automatic and default Type 1 processes could be replaced internally by a combination of Type 1 and Type 2 processes which can be seen as similar to Lazarus and Folkman’s (1984) primary and secondary appraisals, which have been argued by some to be sequential although by others as operating in parallel.

In contrast to these theories of a rational and rather linear nature, support now exists for a parallel-competitive model of decision-making. For instance, Sloman (1996, 2002) found Type 1 and Type 2 processes operated in parallel, thus influencing the decision-making process simultaneously. Denes-Raj and Epstein (1994) also found that participants engaged in the parallel use of Type 1 and Type 2 processes, each “competing” with the other in the decision making process. These examples highlight that the dual-processes people utilise when making decision can operate in a parallel-competitive way, while in other instances, they might operate in a default-interventionist manner.
Klaczynki (2006) and Evans (2009) have argued that the parallel-competitive and default-interventionist conceptualisations of decision-making are not mutually exclusive, but are dependent on the use of Type 3 metacognitive processes. In his Hybrid Model of Decision-Making, Evans argued that Type 3 metacognitive processes determine the differences in use of Type 1 and Type 2 processes seen in the default-interventionist and parallel-competitive models. He also stated that Type 3 processes monitor the information generated by Type 1 and Type 2 processes and control their use to manage the resources expended in making a decision. For example Type 3 process may override time-intensive Type 2 processes in favour of Type 1 processes when a faster decision needs to be made. Conversely, Type 3 process may control the use of faster Type 1 processes and initiate the use of Type 2 processes when a slower, more considered approach is warranted to make the best decision.

Empirical support for Evan’s (2009) Hybrid Model of Decision-Making is promising. For example, Sahlin et al. (2010) found Type 1 and Type 2 processes operated in parallel, with the information generated by these processes being monitored and controlled by Type 3, metacognitive processes. Similarly, Stanovich, West, and Toplak (2011) found Type 1 and Type 2 processes operated sequentially with Type 3 metacognitions monitoring and regulating Type 1 and Type 2 processes as required.

Although the process approach has contributed much to the decision-making literature and our understanding of how people make decisions, there is minimal consideration of the stress that is often associated with making a decision or of people’s satisfaction with their decisions. An alternative branch of research, the conflict approach, developed in parallel not only to these process approaches but also
to the earlier heuristic and normative approaches to decision-making. Researchers in this alternative branch of research, such as Festinger (1957) and Janis and Mann (1977), focused on the experience and impact of decision-making stress that resulted from choosing between conflicting courses of action.

Conflict Approaches

The central premise of the conflict approach is that decision-making often involves choosing between conflicting alternatives and this conflict is associated with feelings of stress which a person is motivated to reduce (Balneaves & Long, 1999). The conflict can result in the decision-maker approaching or avoiding various decision strategies, choice alternatives, and the potential consequences of each alternative (Appelt, Milch, Handgraaf, & Weber, 2011). Decision-making in the presence of conflict may or may not involve making a decision, and may or may not be based rationally (Janis & Mann, 1977). In this instance, the explicit goal of decision-making is to minimise decisional conflict and the implicit goal is to maximise decision satisfaction. An early example of a conflict approach, though less taken up at the time due to the still dominant normative approaches, was Lewin’s (1935, 1943) description of driving and resistance forces.

Lewin (1935, 1943) utilised the concepts and methods of physics and mathematics to describe how internal and external forces such as feelings of regret and level of income determine behaviour across, what he termed, the psychological life space that changes temporally. Lewin argued that when driving forces (i.e., forces that lead to approach behaviour) conflict with resistance forces (i.e., forces that lead to avoidance behaviour) then a state of disequilibrium results, motivating the selection of behavioural strategies such as talking to family and friends,
procrastinating, or making a plan of action to reduce the disequilibrium, all of which today might be termed coping strategies.

Lewin (1935, 1943) categorised three discrete conflict types based on the combination of driving and resistance forces around the decision: (1) approach-avoidance, (2) approach-approach, and (3) avoidance-avoidance. Lewin relied on a mathematical justification of the principles involved in people’s decisions and associated behaviour as opposed to empirical evaluation and as a consequence, although innovative for his time, his conflict types remained largely descriptive.

Atthowe (1960) later argued that Lewin’s (1935, 1943) conflict types are not discrete but lie on a continuum of risk determined by the dominance of approach versus avoidance motivations. Decisions dominated by a motivation to either approach or avoid were termed by Atthowe as univalent and associated with choices of minimal risk. Decisions dominated by varying motivations to approach and avoid were termed disvalent. Lastly, decisions associated with equal levels of approach and avoidance were termed ambivalent.

Atthowe (1960) empirically tested this idea of an approach-avoidance continuum in a sample of 32 psychology undergraduates. He found that decisions involving higher risk on the part of the respondents were associated with close to equal levels of approach and avoidance, while decisions seen to involve less risk had either a disproportionate level of approach or avoidance. Although there were methodological limitations to his research, such as his use of the number, rather than the quality, of pros and cons identified as an indicator of approach and avoidance motivations respectively, Atthowe’s findings provide evidence in support of decision-making conflict. Festinger (1942, 1957), whose work largely overlapped the same decades as Lewin and Atthowe, has provided another example of the
conflict approach to decision-making research through his work on cognitive dissonance.

Festinger (1942, 1957) stated that decision strategies and outcomes are dependent on consonant (i.e., logically flowing) or dissonant (i.e., illogically flowing) cognitions. These cognitions include thoughts the decision-maker has about themself, their attitudes, opinions, environment, and past behaviour. If, when presented with a decision, the person’s cognitions about the options available and the possible decision outcome are not in conflict then a state of cognitive consonance is evoked. When the decision includes cognitions about the options that conflict then a state of cognitive dissonance results and is felt as acute emotional stress. Festinger argued that people’s decision-making is driven to minimise the amount of cognitive dissonance and indirectly to minimise the amount of dissonance-related stress experienced.

Festinger (1942, 1957) also proposed a range of key coping strategies utilised in the reduction of cognitive dissonance. These strategies included: (a) placing more attention or focus on other consonant thoughts, feelings, and behaviours; (b) reducing the importance of, or trivialising, the dissonant thoughts, feelings, and behaviours; (c) changing the dissonant thoughts, feelings, and behaviours to more consonant ones, and (d) changing the situation that initially evoked the dissonance response, either physically or through seeking new information and opinions. These coping strategies are not unlike those proposed many years later by Lazarus and Folkman (1984) in their Transactional Model of Stress and Coping.

In one study operationalising Festinger’s (1942, 1957) coping strategies, Elliot and Devine (1994) found that participants asked to write an essay on a counter-attitudinal topic, compared to a control group who wrote an essay on a topic
about which they felt passionate, reported higher levels of dissonance-related affect such as guilt and anxiety prior to writing the essay. After applying the reduction technique of changing their attitude about the essay topic, the participants then experienced lower levels of dissonance-related affect. The internal drive to reduce cognitive dissonance became evident as completion of the essay-writing task was dependent on participant’s application of dissonance reduction technique. The motivational effect of cognitive dissonance was advanced further by Janis and Mann (1977) in their Conflict Theory.

Janis (1959) and later Janis and Mann (1977) extended the ideas of Lewin (1935, 1943) and Festinger (1942, 1957) in their Conflict Theory. Janis (1959) defined decisional conflict as “opposing tendencies within an individual, which interfere with the formulation, acceptance, or execution of a decision” (p. 7). Janis and Mann (1976, 1977) argued that decisional conflict is inherent in decision-making and, similar to Lazarus and Folkman’s (1984) later theory of stress, patterns of coping with making a decision are directed towards reducing the decisional conflict experienced and to maximising post-decisional satisfaction. Janis and Mann (1976) identified five patterns of coping people may adopt to reduce feelings of decisional conflict: (1) unconflicted adherence, (2) unconflicted change, (3) defensive avoidance, (4) hypervigilance, and (5) vigilance (Table 2.1).

Janis and Mann (1976, 1977) placed their patterns of coping on a continuum of decisional conflict levels, with vigilance associated with a medium or optimal level of decisional conflict. When decisional conflict is low, people are likely to adopt either a coping pattern of unconflicted adherence or unconflicted change and are unlikely to make a decision purely because they do not feel the need to do so. Whereas when decisional conflict is high, people are likely to adopt an hypervigilant
Table 2.1

*Janis and Mann’s (1976) Five Patterns of Coping with Decisional Conflict*

<table>
<thead>
<tr>
<th>Coping Pattern</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unconflicted Adherence</td>
<td>The decision-maker complacently decides to continue whatever they have been doing, ignoring information about the risk of losses.</td>
</tr>
<tr>
<td>Unconflicted Change</td>
<td>The decision-maker uncritically adopts whatever new course of action is most salient or most strongly recommended to them.</td>
</tr>
<tr>
<td>Defensive Avoidance</td>
<td>The decision-maker evades the decisional conflict by procrastinating, shifting responsibility to someone else, or constructing wishful rationalisations and remaining selectively inattentive to corrective information.</td>
</tr>
<tr>
<td>Hypervigilance</td>
<td>The decision-maker searches frantically for a way out of the dilemma and impulsively seizes upon a hastily contrived solution that seems to promise immediate relief, overlooking the full range of consequences of their choice because of emotional excitement, repetitive thinking, and cognitive constriction (manifested by reduction in immediate memory span and simplistic ideas). In its most extreme form, hypervigilance is referred to as “panic”.</td>
</tr>
<tr>
<td>Vigilance</td>
<td>The decision-maker searches painstakingly for relevant information, assimilates it in an unbiased manner, and appraises alternatives carefully before making a choice.</td>
</tr>
</tbody>
</table>

or defensive avoidance coping pattern that would likely result in a decision being made solely to reduce the level of decisional conflict experienced. In effect, decisional conflict drives how a person approaches their decision and even whether a decision is made. The quality of the decision or the person’s satisfaction with it in these circumstances is questionable.

To date, empirical testing of Janis and Mann’s five patterns of coping with decisional conflict (Table 2.1) has been limited by measures that have questionable reliability. For example, Mann, Burnett, Radford, and Ford (1997) developed the Melbourne Decision-Making Questionnaire (MDMQ), which is a 22-item self-report measure with four factors: (1) vigilance, (2) hypervigilance, (3) buck-passing, and (4) procrastination. The first two factors reflect Janis and Mann’s coping patterns described earlier, the other two factors were developed to reflect two aspects of a defensive avoidance coping pattern. While each factor had acceptable internal reliability, the inter-factor correlations were medium to strong, which suggests that these factors do not assess independent patterns of coping. It is of course possible, even probable, that the assessment of independent coping patterns is hindered by participants’ use of multiple coping patterns during the one decision-making process.

Furthermore, measures of coping with decisional conflict such as the MDMQ are typically trait measures, hence limiting the capacity to measure state-based decisional coping strategies across diverse situations. Currently the availability of reliable, state-based measures of Janis and Mann’s coping patterns seems to be lacking. State-based measures of coping strategies from the general stress and coping literature, such as Guppy, Edwards, Brough, Peters-Bean, Sale, and Short’s (2004) Cybernetic Coping Scale-15, may yield better insights into coping in a decision-making context.
While empirical evaluations of Janis and Mann’s Conflict Theory have waned in recent years, their approach is still theoretically relevant especially when considered in parallel with the literature on stress and coping more generally. This general stress and coping literature and its relationships with decision-making will be discussed in the following chapter.

A summary of the major theoretical developments in decision-making research from the early 20th Century to the early 21st Century is presented in Figure 2.1.
Figure 2.1. Timeline of the major theoretical developments in decision-making research from the early 20th Century to the early 21st Century.
Chapter Summary

Early decision researchers (e.g., Ramsey, 1926; Tinter, 1938) utilised a normative approach to decision-making research. They argued that decisions are made rationally, that is decisions are made to maximise actual or expected utilities or prospects and could be predicted with the use of mathematical functions. Later decision researchers (e.g., Kahneman & Tversky, 1979; Simon, 1959) utilised an heuristic approach to decision-making research and argued that decision-making is not always rational and that people utilise heuristics such as the affect heuristic as “mental short-cuts”. They argued that heuristics save time and effort, are bounded by the psychological limitations of the decision-maker, and are utilised ecologically to match external environmental demands. Contemporary researchers (e.g., Evans, 2007; Sahlin et al., 2010) utilised a process approach to decision-making research and focused more on describing the decision-making process itself. Such decision-making process involved the use of fast, less effortful Type 1 (heuristic) processes and slower, more effortful Type 2 (normative) processes. In a roughly parallel branch of decision research, conflict-based researchers (e.g., Festinger, 1957; Janis & Mann, 1977; Lewin, 1943) argued that minimising decisional conflict over the available options and maximising decision satisfaction are the central motivating factors in people’s decision-making. Parallels between the conflict approach and the stress and coping literature more generally were suggested.
CHAPTER THREE

Stress and Coping

Stress is an universal phenomenon with which people cope on an almost daily basis. Researchers and clinicians have developed multiple models by which to understand stress and coping. Initially, Cannon (1935) and Selye (1950) viewed stress as a response to an external demand or stressor that triggers people to either approach or avoid the stressor. Holmes and Rahe (1967) and Dohrenwend, Krasnoff, Askenasy, and Dohrenwend (1978) later viewed stress as the stimulus or demand itself. Lazarus and Folkman (1984) later considered stress as a cognitive process that involves an appraisal of a demand or stressor against the resources available to deal with that demand. Decision-making can also be considered a demand that is stressful to the individual. In each situation of stress, the individual needs to adopt strategies to deal or cope with the situation. These coping strategies range from the basic flight or fight scenario to the use of proactive strategies, sophisticated cognitive restructuring techniques and the use of others as support. The aim in this chapter is to review the major developments in stress and coping research and how they might further our understanding of decision-making.

Response Theories

Researchers who focused on stress as a response have looked at both people’s internal and behavioural responses to a demand or stressor. Cannon (1932, 1935) hypothesised that physical stimuli or stressors such as changes in temperature or oxygen levels place pressure on people’s biological systems and trigger an internal response or “stress”. In a sample of rats exposed to various stressors, for example hypoxic or cold conditions, Cannon (1935) found the rats’ bodies responded with the activation of their sympathetic nervous system as well as
behavioural responses designed to cope with the stressor by attacking or escaping from it. When the stressor was removed, the rats’ parasympathetic nervous system restored the body to a state of homeostasis. Cannon extrapolated from his results with animals to humans. He concluded that a stressor or external stimulus results in the activation of a person’s sympathetic nervous system that, like in his animal studies, prompts the person to cope by preparing them to flee from or fight the stressor. Cannon termed this the flight or fight response. Although Cannon did not explicitly term these physiological and behavioural responses as “coping”, they clearly can be viewed as such.

In his conceptualisation of stress, Cannon (1935) focused solely on neurological and behavioural responses and utilised only objective, experimental methodologies with animal samples to support his theory. At the time, contemporaries such as Skinner (1938) and J. B. Watson (1919) argued that objective, experimental methodologies were the “gold standard” for obtaining reliable and valid data. Cannon, like his contemporaries, made no reference to people’s subjective experience of stress or any associated psychological processes. Ellis (1962) later argued that this lack of subjectivity limits the generalisability of Cannon’s results from animals to the human experience.

Selye (1950, 1956) also focused on stress as a response. In his laboratory experiments with rats, Selye observed what he considered were generalised biological responses to a range of stressors. As a surgeon, he noted a similar pattern of stress responses in his human patients when faced with the demands of surgery. He categorised these responses into three phases: (1) Alarm, (2) Resistance, and (3) Exhaustion and argued that these phases constitute a General Adaptation Syndrome (GAS) to stressors.
The alarm phase is when the sympathetic nervous system is activated in response to a stressor and prepares the body to respond to or cope with the stressor. This response involves decreasing biological activities not essential to immediate survival, such as digestive and bowel activities, so that the body can focus on proactive functions, such as increasing the heart rate and glucose release rate, in order for the body to deal or cope more effectively with the stressor. The alarm phase is not dissimilar to the biological responses described by Cannon (1935) in his flight or fight response. If the issue is resolved the parasympathetic nervous system returns the body to a homeostatic condition: should the stressor or demand not be resolved and be ongoing then the body enters the resistance phase.

The resistance phase is characterised by further behavioural responses aimed at resisting the stressor by removing or avoiding it, and these efforts can be conscious (e.g., instigating a plan to reduce the stressor) or unconscious (e.g., reflex responses, such as shivering). While in the resistance phase, Selye argued that the body is under continual strain and if the stressor is not dealt with and the body returned to its’ homeostatic state, then the person will eventually enter an exhaustion phase.

In the exhaustion phase, the last phase in the GAS, the stressor can no longer be resisted as the person’s internal and external resources are severely depleted. This depletion can result in damage to biological systems, the body becoming exhausted of all resources and vulnerable to illness and, in extreme cases, death.

Selye has made a significant contribution to stress research, yet criticism of his GAS theory comes from later researchers such as Appley and Trumbell (1967) and Lazarus and Folkman (1984). These criticisms related primarily to Selye’s assumption that responses to a stressor are the same regardless of who is
experiencing the stressor or the type of stressor being experienced. Some support for
this critique comes from Shedletsky and Endler (1974) who found variations in
people’s physiological responses to the threat of an electric shock versus their
responses to the threat of disapproval from others. These variations in physiological
responses do not support the generalised response that Selye presented in his GAS.
Frankenhaeuser’s (1971, 1976, 1982, 1991) research on biological stress markers
has, in part, supported the idea that people can vary in their response.

Frankenhaeuser (1982, 1991) stated that stressors can evoke a generalised
response, but she also identified specific biological stress responses. She termed
these responses biological stress markers. The generalised biological stress response
she identified involves the release of the hormones adrenaline and noradrenaline into
the bloodstream causing an activation or arousal of the person’s sympathetic nervous
system. This activation is not unlike Selye’s (1950) alarm phase of the GAS and that
prompting Cannon’s (1935) flight or fight response. As the stressor increases in
intensity, for example increases in workload, the release of adrenaline and
noradrenaline and activation of the sympathetic nervous system increase
accordingly. Once the situation is dealt or coped with, then the hormone cortisol is
released into the bloodstream to counteract the effects of adrenaline and
noradrenaline via activation of the parasympathetic nervous system and return the
body to a state of homeostasis. Frankenhaeuser (1982) argued that this combined
release of adrenaline, noradrenaline, and cortisol reflects a generalised stress
response similar to Selye’s description in his GAS: but also, based on a series of
laboratory experiments with adult samples, she identified specific responses in
different situations.
Frankenhaeuser (1982) found that in stressful situations where participants perceived themselves to have low controllability over the situation and experienced high negative affect, their cortisol, adrenaline, and noradrenaline levels significantly increased above their at-rest baseline levels. In participants who perceived they had high controllability over the situation and experienced low negative affect, their adrenaline and noradrenaline levels increased over both baseline and significantly over those in the “low controllability” situation. Their cortisol levels however, were significantly lower than their at-rest baseline measures and the low controllability group. These variations in adrenaline, noradrenaline, and cortisol suggest that specific stress responses can occur where there are different attitudes towards or appraisals of the situation, in this case, participants’ level of control. How people might appraise and respond to diverse decisions remains unclear.

If decision-making is considered first within the response theories of stress (Cannon, 1935; Frankenhaeuser, 1982; Selye, 1950), the situation that requires a decision be made such as having to decide between different medical treatments, could be considered the stimulus that evokes people’s biological stress responses. Example responses could include increases in the decision-maker’s pulse rate, an inability to sleep, and even a loss or increase in appetite. These responses can also be indicative of the activation of the person’s sympathetic nervous system in response to a demanding stimulus, in this case, the need to make a decision. The decision-maker would then direct their behaviour to returning their body to a state of homeostasis either by making the decision or by other methods such as avoiding the decision, or utilising proactive coping strategies such as seeking more information or using social supports. Of course, a decision that triggers a response involving the
sympathetic nervous system would typically be one of great importance to the person.

While there may be merit in utilising a response model of stress and coping in decision-making research, its focus is on the biological responses to the decision with scant consideration given to the need to make a decision as a stimulus or demand. As such, it seems that the application of this model to decision-making research is limited. Other researchers have considered environmental events or stimuli as the sources of stress rather than focusing on the responses evoked.

**Stimulus Theories**

Much research, especially in the 1960s and 70s, was focused on stress as an external stimulus or stressor that is associated levels of coping or “social readjustment” to deal with it (Dohrenwend et al., 1978; Holmes & Rahe, 1967; Rahe, Meyer, Smith, Kjaer, & Holmes, 1964; Sarason et al., 1978). External stimuli or stressors, such as work load or relationship issues, can provoke a stress response including internal feelings of tension or strain (Moore & Cooper, 1998). The types of stimuli, both positive and negative, considered to impose a level of strain on people range from major life events such as the loss of a spouse (Dohrenwend et al., 1978; Holmes & Rahe, 1967) to daily hassles such as traffic jams (DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982; Kanner, Coyne, Schaefer, & Lazarus, 1981). Even positive life events such as marriage or daily uplifts such as eating out or organising to meet with friends can be stressors (Kanner et al., 1981). Holmes and Rahe (1967) provided one of the initial stimulus measures with their work on major life events.

Holmes and Rahe listed 43 positive and negative major life events such as marriage (positive) and the death of a spouse (negative) that people commonly
reported to involve significant social change or re-adjustment in their life over a 12-month period. Attached to each major life event is a numerical weight based on mean ratings of the events’ stressfulness which Holmes and Rahe termed life change units. The death of a spouse has the highest weighting of 100 life change units; the lowest weighting of 11 life change units is for minor violations of the law. Holmes and Rahe argued that the product of an event’s life change unit weighting by the number of times a person has experienced that particular event is an indication of how much stress has been experienced in the previous 12 months. They further stated that the frequency of each major life event experienced in the previous 12 months multiplied by its respective life change unit weighting can predict the potential for the person to experience illness in the subsequent 12 months. Each event required the person to make some adjustment to their habits and lifestyle, which we would now call coping. At the time, Holmes and Rahe’s approach was considered an important step towards objectively conceptualising and measuring stress (Dohrenwend et al., 1978; Sarason et al., 1978) and their Social Readjustment Rating Scale is still in frequent use.

Not all researchers, for example Vinokur and Selzer (1975) and Mueller, Edwards, and Yarvis (1977) were optimistic about Holmes and Rahe’s linking of major life events to stress and coping and they argued for more subjective factors to be taken into consideration. One such factor is the desirability and undesirability of major life events (Sarason et al., 1978).

Sarason et al. revised Holmes and Rahe’s (1967) list of major life events commonly reported by people over a 12-month period to include 57 major life events. They stated that their revised list provided a more comprehensive and representative list of major life events than that provided by Holmes and Rahe. In
addition, Sarason et al. introduced more subjectivity to their measure by removing Holmes and Rahe’s pre-determined life change unit weightings and allowing people to designate the extent to which each major life event had a positive (desirable) or negative (undesirable) impact on their lives in the previous 12-months. The greater the impact on their lives, both desirable and undesirable, the greater the stress they reported to have experienced. They related these scores, like Holmes and Rahe, to the individual’s vulnerability to illness over the next 12 months. While Holmes and Rahe’s list of major life events also included both undesirable (e.g., death of a spouse) and desirable events (e.g., outstanding personal achievement), this distinction is not an explicit aspect in their work. Kanner et al. (1981) later contended that it is the minor, everyday events or daily hassles and not major life events that are better indicators of the stress people experience on a daily and perhaps even a cumulative basis.

Kanner et al. (1981) defined daily hassles as “the irritating, frustrating, distressing demands that to some degree characterize [sic] everyday transactions with the environment” (p. 3). Daily hassles can include having to wait in queues, being caught in traffic, or having too many meetings at work. While not a universally accepted view, Kanner et al. argued that daily hassles have a more proximal effect on people’s lives and are therefore a better indicator of people’s stress than major life events that often have a more distal effect. They also argued that the cumulative effect of daily hassles could be regarded as the total level of people’s stress in much the same way as major life events.

Kanner et al. (1981) developed a list of 117 daily hassles, for example misplacing or losing things and filling out forms, commonly reported by people in a one-month period. They argued that the frequency and intensity of daily hassles
experienced in a one-month period could be utilised as an index of the average stress people have experienced in that period. Kanner et al. conceptualised the counterpart of daily hassles, daily uplifts, in much the same way however research suggests that uplifts are not associated with people’s health (DeLongis et al., 1982).

In the first instance, these stimulus models appear to have more to offer decision researchers than the earlier response models in that the situation demanding a decision be made could be viewed as the stimulus or stressor acting on the person. The level of stress involved with making the decision might then be determined by the type of decision being made, for example a decision related to a person’s ill-health might be considered more stressful than a decision related to say, a change in their occupation. A limitation with this approach is the lack of consideration for how people actually cope with their stress. Another limitation lies in the absence of cognitive processes people undertake with respect to the stressor or the decision to be made. These cognitive processes, for example primary and secondary appraisals (Lazarus & Folkman, 1984), were explored in what are now known as the cognitive theories of stress and coping discussed next.

**Cognitive Theories**

In one of the earliest cognitive theories of stress and coping, Pearlin and Schooler (1978) defined stress in terms of the negative emotional responses to external stressors or life-strains. The ways in which one deals with the demand they termed coping. This refocus of stress as internal to the person marks a shift from the earlier stimulus models and also provides an explicit reference to coping. This approach is unique to the cognitive theories compared with the response and stimulus theories, wherein coping is merely inferred or described more in terms of a
spontaneous reaction, such as Cannon’s (1935) flight or flight response, rather than something more deliberate or proactive.

Pearlin and Schooler argued that coping has a protective function that can be effected in three ways: (1) removing or modifying the stressor, for example problem-solving or changing aspects of the stressor; (2) modifying or reframing the meaning of the stressor, for example changing one’s expectations about the stressor and (3) keeping the experience of stress within manageable bounds, for example by crying, screaming, or avoiding the stressor. Billings and Moos (1981, 1984) later described three types of coping strategies which are not markedly different to what Pearlin and Schooler proposed: (1) appraisal-focused coping, which involves people’s efforts to change their thoughts or expectations about the stressor; (2) problem-focused coping, which involves people’s efforts to problem-solve and change the stressor; and (3) emotion-focused coping, which involves people’s efforts to regulate the intensity of their stress response.

In their Transactional Model of Stress and Coping, Lazarus and Folkman (1984) also described types of coping, but these were based on a different definition of stress. They argued that stress is people’s perceived or appraised gap between situational demands or stressors and the resources available to them to meet those demands. This appraised gap then prompts the person to instigate coping strategies to reduce the gap and therefore the stress experienced. Lazarus and Folkman’s conceptualisation of stress and coping has probably been the most widely utilised in the literature over the past 30 years.

Lazarus and Folkman proposed that people use cognitive appraisals to assess the demands placed on them by a stressor. This process begins with a primary appraisal of the personal importance or significance of the demand to the
individual’s wellbeing. They identified five possible outcomes of this primary appraisal, such that the situation is considered: (1) harmful, (2) threatening, (3) challenging, (4) beneficial, or (5) benign. Subsequent to this primary appraisal of what the demand means to the person, Lazarus and Folkman argued that people then engage in a secondary appraisal.

They defined secondary appraisal as the person’s cognitive evaluation of the resources available to them or their general ability to cope with the demands of the situation. These resources could be external, for example having enough time or social support networks, or internal, such as having an internal locus of control or sense of self-efficacy. This secondary appraisal, based on the primary appraisal, is said to determine a person’s level of stress and the coping strategies employed to reduce the stress. For example, if a person’s primary appraisal of the demand from a stressor is harmful to their wellbeing and their secondary appraisal is that they do not have enough internal or external resources to meet those harmful demands, there is a perceived gap. The wider this gap the more stressful the situation will be for the person and the more coping strategies people try to utilise.

Lazarus and Folkman (1984) argued that people use two types of coping strategies to manage their stress: (1) problem-focused coping, which is similar to what Billings and Moos (1981) identified earlier; and (2) emotion-focused coping, which is also similar to Billings and Moos’ (1981) and Pearling and Schooler’s (1978) earlier models. Although Lazarus and Folkman did not include what Billings and Moos described as appraisal-focused coping, they did focus on the role of primary and secondary appraisals as antecedents to stress instead of coping responses to stress. They also argued that people employ problem-focused coping to change or problem-solve the situation when they appraise it as controllable. People
employ emotion-focused coping to change their perceptions or expectations about the situation when they appraise is as uncontrollable. People can also employ problem-focused and emotion-focused coping simultaneously until the appraised gap between the demands and resources, that is their stress level, is minimised or resolved. Hobfoll (1988, 1989) later described how people conserve resources in order to cope with appraised demands and subsequent feelings of stress.

In his Conservation of Resources (COR) theory, Hobfoll described people’s stress and coping as the continual striving to attain, retain, and maintain instrumental (e.g., money or assets), social (e.g., relationships or reputation), and psychological (e.g., self-confidence or sense of control) resources. Hobfoll argued that three factors influence the level of stress experienced: (1) anticipated or appraised loss of resources, (2) actual loss of resources, and (3) lack of resource gain despite efforts. He also argued that people’s feelings of stress could deplete the resources available to them for use as a buffer against further stress.

When faced with a decision, it may be that the person is also appraising the loss or gain of resources relevant to that decision. Hobfoll’s focus on the appraised loss of or gain in resources and attempts to conserve these resources has some commonality with Lazarus and Folkman’s (1984) focus on minimising the perceived gap between demands and resources, although his focus is on the latter. Later researchers such as J. R. Edwards (1992) and Ursin and Eriksen (2004) have also adopted Lazarus and Folkman’s (1984) basic premise of demands versus resources gap minimisation at the centre of their stress and coping models.

In his Cybernetic Model of Stress and Coping, J. R. Edwards (1992) outlined a negative feedback loop in which people are continually comparing the current state of their internal and external environment against a reference criterion or desired
state. Stress occurs and coping strategies employed when the person’s actual and desired states differ, that is, there is a gap. The greater the gap, the greater the stress experienced and the stronger the person is motivated or driven to reduce the perceived gap or change their expectations around what constitutes a desired state. Ursin and Eriksen (2004) also described this negative feedback loop in their Cognitive Activation Theory of Stress (CATS). In their definition of stress they incorporated not only psychological but also the biological factors that Cannon (1935) and Selye (1950) described in their earlier response models and the environmental factors Holmes and Rahe (1967) and Kanner et al. (1981) described in their stimulus models.

The cognitive theories of stress and coping have probably the most value in understanding people’s decision-making stress and their subsequent decision satisfaction. For example, the primary and secondary appraisals that form the basis of Lazarus and Folkman’s (1984) Transactional Model of Stress are not dissimilar to the types of appraisals Janis and Mann (1977) described in their Conflict Theory. In Conflict Theory, the identification of a need to make a decision can be viewed as the primary appraisal. The person’s secondary appraisal of the resources they have available to make the decision, that is, to meet the demand, would then predict the level of decision-making stress experienced. From this would follow the type of decisional coping strategies needed to reduce any decision-making stress and facilitate a satisfying decision. While there are strengths in utilising a cognitive theory of stress and coping within the decision-making context there are some limitations.

One limitation to utilising these cognitive theories in decision-making research, or indeed any research, lies in the inability to operationalise primary and
secondary appraisals independently to avoid tautological issues. This issue might be addressed by making an assumption that the need to make a decision is, in itself, the primary appraisal while the secondary appraisals involve identifying the resources available to help make an informed or satisfying decision. It is this process, or secondary appraisal, that will be assessed in this thesis to predict the level of decision-making stress and decision satisfaction.

A timeline of the major theoretical developments in stress and coping research, together with the major theoretical developments in decision-making research for comparison (adapted from Figure 2.1) is presented in Figure 3.1.
Figure 3.1. Timeline of the major theoretical developments in stress and coping research from the early 20th Century to the late 20th Century, together with the major theoretical developments in decision-making research (adapted from Figure 2.1).
The shifts over the last century from a rational and behavioural perspective to one incorporating cognitions can be seen to occur in both the decision-making and stress and coping research. These shifts seem to indicate the influence of the zeitgeist and advances in psychology theories generally.

Additional factors that may have an impact on people’s decision-making involve the recent research into people’s metacognitions, specifically people’s metacognitive awareness and acceptance. There is currently no extant work that has addressed these metacognitions in the decision-making context and this possibility will be discussed in the next chapter.

**Chapter Summary**

The major developments in stress and coping research: response theories, stimulus theories, and cognitive theories, were reviewed in this chapter. In the early 20th Century, stress was commonly viewed as a response that prompted a person to approach or avoid a stimulus or stressor, for example Cannon’s (1932; 1935) flight or fight response and Selye’s (1950, 1956) General Adaptation Syndrome. In the mid 20th Century, researchers such as Holmes and Rahe (1967) and Kanner et al. (1981) conceptualised stress in terms of stimuli (e.g., major life events, daily hassles, and daily uplifts) acting on the person and involving a level of social readjustment. Later, Lazarus and Folkman (1984) viewed stress as a cognitive process involving cognitive appraisals of the “gap” between the demands of a situation and the resources available to cope with those demands. The integration of a stress and coping model with a conflict model of decision-making was suggested. The parallels between these models over time were presented. The chapter was concluded with the suggestion that recent developments related to people’s metacognitions may also a role in a model of decision-making stress and satisfaction.
CHAPTER FOUR

Metacognitions and Cognitive-Behavioural Therapies

Recent developments in cognitive-behavioural therapies include methods to cultivate people’s metacognitive abilities, specifically their metacognitive awareness and acceptance (Herbert & Forman, 2011). The focus on metacognitions and psychological flexibility has posed a challenge to traditional cognitive-behavioural therapies such as Ellis’ (1962) Rational Emotive Therapy and Beck’s (1976) Cognitive Therapy where the focus has been on controlling and changing the content and frequency of distorted and rigid cognitions. Although metacognitive awareness and acceptance have been found to improve people’s health and wellbeing (Bourne, Morris, & Eldemire-Shearer, 2010; Chawla & Ostafin, 2007; Kashdan & Rottenberg, 2010), the conceptualisation of these concepts is varied and their role in reducing stress and enhancing people’s decision-making is unexplored. The aim in this chapter is to review the traditional cognitive-behavioural therapies, the subsequent work on metacognitions, and their possible influence on people’s decision-making.

**Traditional Cognitive-Behavioural Therapies**

Researchers during the early 20th Century, such as J. B. Watson (1919) and Skinner (1938), utilised a behavioural approach to psychological therapy and research. The presence of cognitions or what Skinner (1938) called “private events” were acknowledged but considered irrelevant in understanding and changing people’s behaviour. In the cognitive revolution of the mid-20th Century, cognitive psychologists such as Beck (1976) and Ellis (1962) contested the earlier behavioural approach and the irrelevance of people’s cognitions in relation to their behaviour. Ellis’s (1962, 1970, 1993) research on rules and core beliefs is one example of this shift.
Ellis hypothesised that people make sense of life experiences by creating rules for themselves and others based on their core beliefs, for example “things must be the way I plan them or life will be unbearable”. These core beliefs then guide future cognitions and behaviours. Such rules and core beliefs are created through the assimilation and accommodation of new experiential information into mental structures that Piaget (1950, 1963, 1970) had termed schemas. Ellis (1962) and Beck (1976) stated that schemas can be of either a positive or a negative nature.

As Piaget (1950, 1963, 1970) described in his Cognitive Development Theory, schemas contain information relating to particular past experiences organised to facilitate understanding of present experiences and to anticipate future experiences. The process of assimilation involves modifying new incoming experiential information to fit into established schemas. The process of accommodation involves altering established schemas to fit the new incoming experiential information and comes into effect when assimilation fails. When people are able to assimilate new experiences into established schemas or modify their schemas to accommodate new experiential information then a state of equilibrium is reached. This new state of adaptation results in an higher stage of cognitive development. Piaget argued that any rigidity in people’s ability to assimilate and accommodate new experiential information could result in cognitive developmental delays.

Although rules, core beliefs, and schemas facilitate the process of working through and making sense of everyday experiences, Ellis (1962, 1970, 1993) also argued that problems arise when these cognitions become irrational and rigid. Ellis identified rigidity in terms of the general or blanket nature of people’s cognitions, characterised by words such as “I should” and “I must”. Ellis described three
indicators of irrational and rigid cognitions where: (1) the achievement of goals is blocked, resulting in distressing emotions that persist and in behaviours that are harmful to oneself, others, and life overall; (2) reality is distorted or misinterpreted even in the presence of contradictory evidence; and (3) ways of thinking about and evaluating oneself, others, and life are illogical. Beck’s (1976; Beck & Weishaar, 1989) concept of cognitive distortions is another example of where cognitions become irrational and rigid. Clearly such rigidity could make decision-making difficult, if not distressing and outcomes unsatisfying.

Beck and colleagues (1976; Beck & Weishaar, 1989) argued that people’s everyday cognitions can become distorted and rigid during the process of assimilating and accommodating new experiential information. Beck and Weishaar (1989) classified these cognitive distortions into six types: (1) Arbitrary Inference, e.g., In the context of the company for which you work downsizing due to financial difficulties, you automatically think: “I must have lost my job because I am a bad worker” (2) Overgeneralisation, e.g., “I will never be a success because I failed my first assignment” (3) Selective Abstraction, also known as Tunnel Vision or Mental Filter, e.g., “My friend [who was rushing to work] has rejected me because he did not stop to say hello” (4) Personalisation, e.g., “People laughing together are laughing at me” (5) Polarised Thinking or Black-and-White Thinking, e.g., “If everyone does not approve of me then I am worthless” and (6) Magnification or Minimisation, e.g., “I will become destitute now that I have lost my wallet”. Each type of cognitive distortion results in an automatic misinterpretation of reality and a somewhat rigid way of perceiving one’s self, others, and the world (Dryden & David, 2008; Sporrle, Strobel, & Tumasjan, 2010).
Beck (1976) developed the principles in his Cognitive Therapy (CT) as a means of reducing the negative effect of people’s distorted cognitions on their behaviour. The focus in CT is on directly challenging people’s distorted and rigid cognitions in order to change their content and frequency. One therapeutic technique utilised in CT includes thought stopping where people are taught to say “Stop!” aloud or in their head whenever they become aware of an unwanted cognition such as “I am a failure” and substitute a more rational, pre-determined thought. Another technique is cognitive restructuring where people are taught to verify the truth of their cognitions through logical disputation instead of automatically viewing their cognitions as facts. Ellis (1970) also sought to reduce the negative effect of people’s distorted and rigid cognitions on behaviour with the development of his Rational Emotive Therapy (RET), now termed Rational-Emotive Behavioural Therapy (REBT).

Ellis (1970) developed REBT as a method to teach people how to challenge and replace their irrational core beliefs. Ellis created an “ABC” format to facilitate REBT. The “A” represents identifying the actual event; the “B” represents the person identifying their core beliefs about the event; and the “C” represents the person identifying the consequences of their core beliefs in terms of their emotions and behaviour. Ellis (2005) has since extended this ABC format to include “D” – disputing irrational core beliefs with rational core beliefs, “E” – the new effect or consequence as a function of changing the original belief. Ellis stated that the main process of challenging the identified irrational core beliefs (B) is through logical or rational disputation, which Beck (1976) also described in his CT model. Both REBT and CT have since been subsumed under the more commonly used title of Cognitive Behaviour Therapy (CBT).
The efficacy of CBT has been demonstrated in several empirical studies. For instance, Allen et al. (2010) used CBT with depressed and anxious adults and found that participation in CBT significantly reduced participants’ symptoms. Alavi, Sharifi, Ghanizadeh, and Dehbozorgi (2013), in a sample of adolescents who had attempted suicide, found that participation in CBT significantly reduced their suicidal ideation, feelings of hopelessness and of depression. Similarly, Safren et al. (2013) found participation in CBT significantly improved adherence to diabetes self-management tasks such as checking blood glucose levels and taking prescribed medications in their sample of adults with uncontrolled Type Two Diabetes. Overall, the clinical use of CBT has yielded good results in reducing people’s psychological distress and increasing health-promoting behaviours.

Recent developments in CBT, such as Hayes et al.’s (2006) Acceptance and Commitment Therapy (ACT), have shifted the focus from identifying, challenging, and replacing negative distortions to the active cultivation of people’s metacognitions in order to increase their psychological flexibility. As Hayes et al. stated, the cultivation of psychological flexibility enables people to make more value-consistent decisions over what courses of action to commit to in life. The flow-on effects from this being much improved health and psychological wellbeing (Gregg, Callaghan, Hayes, & Glenn-Lawson, 2007; Harris, 2006; Wicksell, Olsson, et al., 2010).

**Psychological Flexibility and Metacognitions**

Recent developments in CBT have involved, directly or indirectly, a focus on increasing people’s psychological flexibility instead of the traditional focus on reducing their cognitive distortions and rigidity. This more positive approach is
consistent with the recent developments in positive psychology generally (Seligman & Csikszentmihalyi, 2000).

Hayes et al. (2006) defined psychological flexibility as “the ability to fully contact the present moment and the thoughts and feelings it contains without needless defence, and,…persisting or changing behaviour in the pursuit of goals and values” (p. 9). Harris (2008) defined psychological flexibility as “the ability to adapt to a situation with awareness, openness, and focus and to take effective action, guided by your values” (p. 41). While Wicksell, Lekander, Sorjonen, and Olsson (2010) defined psychological flexibility as “the ability to act effectively in accordance with a valued life in the presence of unpleasant thoughts, emotions, or bodily symptoms” (p. 771). While these definitions vary, they have a sense of positiveness in common. Furthermore, these definitions all incorporate what have been termed metacognitions, particularly metacognitive awareness and acceptance. Metacognitive awareness and acceptance are directed at being able to choose and commit to a course of action consistent with one’s personal life values (Hayes et al., 2006).

Flavell (1976) provided one of the first definitions of metacognition stating: “metacognition refers to one’s knowledge concerning one’s own cognitive processes and products or anything related to them” (p. 232). Hennessey (1999) later defined metacognition as “(1) an awareness of one’s own thinking; (2) an awareness of the content of one’s conceptions; [and] (3) an active monitoring of one’s cognitive processes” (p. 3). More recently, Akturk and Sahin (2011) defined metacognition as: …individuals’ planning of their information about their own and others’ cognitive processes before they fulfil their task, observing their thinking, learning and understanding while performing a task, controlling and
regulating their thinking by making arrangements on site and evaluating after they have completed their task. (p. 3732)

By extension, metacognitive awareness is a person’s ability to be aware of or pay attention to their thoughts and thinking (Schraw & Dennison, 1994), while metacognitive acceptance is the person’s acceptance of their thoughts and thinking made conscious through their metacognitive awareness (Atkinson & Wade, 2012). While metacognitive awareness together with metacognitive acceptance may not stop people experiencing distress, they might allow people the opportunity to choose the way in which they respond to the distress (Harris, 2009a).

Hayes et al. (2006) stated that the therapeutic process in ACT is to cultivate people’s metacognitive awareness and metacognitive acceptance and direct these towards choosing a course of action that is satisfying or consistent with their life values. The aim in this process is to increase explicitly people’s psychological flexibility, a by-product of increased metacognitive awareness and metacognitive acceptance. For example, the person who automatically avoids social interactions due to the fear of having a panic attack could, through increasing their metacognitive awareness and acceptance of their fear, decides to start going to the local market. The person may still feel fearful while at the local market, but the automatic avoidance of such a situation can now be reduced. Furthermore, they now have more control over deciding whether they will continue to avoid or now approach social situations more generally. It may be that metacognitive awareness contributes to less decision-making stress by creating a mental “distance” between the person’s sense of “self” and their experience of distress. Also, metacognitive acceptance may make the person more conducive to the use of positive coping strategies and less emotion-
focused or avoidance-based coping strategies when faced with the stress associated with making an important decision.

Such a premise supports the therapeutic techniques in ACT which are designed to cultivate people’s metacognitive awareness and acceptance to increase personal control over decisions about the best course of action to take (Fletcher & Hayes, 2005). One technique used specifically to cultivate metacognitive awareness is to label the process of thinking. For example, take the negative self-referential thought: “I am a bad person”, and insert the phrase: “I’m having the thought that…” in front of it so that the thought becomes: “I’m having the thought that I am a bad person”. Hayes, Levin, Plumb-Vilardaga, Villatte, and Pistorello (2013) argued that this technique de-literalises thoughts and allows the person to defuse or separate their sense of self or identify from the content of their thinking and thus become more metacognitively aware. In the context of decision-making, people may experience reduced decision-making stress as increased metacognitive awareness defuses their sense of self from the content of their thinking and de-literalises that thought content. Although difficult when experiencing the discomfort of stress, a higher level of metacognitive acceptance may assist people in using less emotion-focused or avoidance-based and more problem-solving behaviours to make a more personally satisfying decision. As metacognitive awareness and acceptance are integral components of ACT (Hayes et al., 2006), research that has explored the efficacy of ACT is reviewed next.

**Empirical Support for Metacognitive Awareness and Acceptance**

Empirical research on the outcomes of ACT is in its infancy, yet most evidence to date suggests it is an effective therapeutic framework to enhance people’s health and wellbeing. In a systematic review and meta-analysis comparing
the outcomes associated with the use of ACT versus traditional CBT, Ruiz (2012) found that ACT resulted in similar reductions in people’s anxiety levels as did CBT, but those receiving ACT experienced greater reductions in depression and greater improvements in their quality of life than those receiving CBT. Similarly, Sharp (2012) in a review of the use of ACT and CBT with people experiencing anxiety disorders found both therapies to be effective in reducing the severity and frequency of anxiety symptoms.

In addition, Folke, Thomas, and Melin (2012) found people with long-term depression who participated in ACT compared to a group not receiving any active treatment experienced significant decreases in their depression levels and increases in their general health and quality of life compared to the control group. In a sample of adults with mild to moderate depression, Bohlmeijer, Fledderus, Rokx, and Pieterse (2011) also found those who participated in ACT reported significant decreases in their depression levels compared with those people on the waiting list for the ACT program.

Although these results are promising, Mahaffey, Wheaton, Fabricant, Berman, and Abramowitz (2012) found metacognitive acceptance had no predictive effect on participants’ levels of social phobia. Also, Landstra, Ciarrochi, Deane, and Hillman (2013) found no direct effect for metacognitive acceptance on participants’ levels of depression, anxiety, stress, and physical quality of life, although they did find that metacognitive acceptance had an indirect effect on participants’ ability to identify and describe their emotions. While these studies might suggest the findings overall are equivocal, on balance the results support the positive impact of metacognitive awareness and acceptance on people’s psychological wellbeing. Furthermore, Landstra et al.’s study highlights the psychological insight that people
can achieve as a result of metacognitive acceptance training. This training, in itself, may be an important initiative in decision-making.

The ACT-based research however does have limitations. As with other therapies and therapy-outcome research, there is uncertainty around which components of the ACT process contributed to the positive outcomes. Was it the development of metacognitive awareness that resulted in the person’s decreased levels of distress? Or was it their commitment to a course of action consistent with their personal life values? Perhaps it was neither of these as it is also possible that the outcomes observed were due to the quality of the therapeutic relationship itself or due to a placebo effect. The effect of both of these factors has typically been underestimated in the literature (Faries, Yalcin, Harder, & Heiligenstein, 2001; Posternak & Zimmerman, 2007).

Despite these limitations, it does seem that metacognitive awareness can lead to decreases in people’s anxiety and distress which, in turn, may have a effect on people’s levels of metacognitive acceptance. If one can remain metacognitively accepting even when experiencing stress, then a reduced level of emotion-focused or avoidance might ensue while at the same time proactive coping might be enhanced. It can be suggested therefore, that metacognitive awareness and acceptance may have a positive impact on people’s decision-making. The role of metacognitive awareness is to create a psychological distance or space between self as the “thinker” and the content of that thinking which, even when these cognitions are negative, distorted, or stress-provoking, could lead to reduced levels of anxiety and stress.

The proposed effects of metacognitive awareness and acceptance on people’s decision-making will be discussed in the next chapter where the development of a Cognitive-Affective Model of Decision Making Stress and Satisfaction is presented.
Chapter Summary

In the cognitive revolution of the 1960s and 70s, therapies focused on people’s cognitions, rules, and core beliefs, such as Ellis’ (1962) REBT and Beck’s (1976) CT, were developed. The aim in these traditional forms of CBT was to challenge and change people’s distorted and rigid cognitions. More recent developments in CBT, such as Hayes’ (2006) ACT, are less focused on challenging and changing cognitions and more focused on increasing people’s psychological flexibility through the cultivation of their metacognitive awareness and acceptance.

Metacognitive awareness refers to people’s awareness of their thoughts and thinking. Metacognitive acceptance refers to people’s ability to maintain their metacognitive awareness of their thoughts and thinking without needless defence or avoidance. Empirical support for the cultivation of these metacognitions, being an integral component of ACT, has been largely positive (Ruiz, 2012; Sharp, 2012). It was suggested that metacognitive awareness and acceptance might also be relevant in the context of decision-making stress and satisfaction.
CHAPTER FIVE

A Cognitive-Affective Model of Decision-Making Stress and Satisfaction

In this chapter, a Cognitive-Affective Model of Decision-Making Stress and Satisfaction will be developed based upon an integration of Janis and Mann’s (1977) Conflict Theory, Lazarus and Folkman’s (1984) Transactional Model of Stress and Coping, and recent research on metacognitive awareness and acceptance.

Decision-Making Stress: Conflict and Affect

As discussed earlier, Janis and Mann (1977) defined decisional conflict as “simultaneous opposing tendencies within the individual to accept and reject a given course of action” (p. 46). They argued that decisional conflict is characterised by mental distress due to: (1) feeling uninformed about the available alternatives, (2) unclear values regarding the best course of action to follow, (3) feeling unsupported or pressured by others in making a decision, and (4) uncertainty around the potential benefits and consequences of each alternative course of action. It is these unpleasant emotional and social factors that Janis and Mann argued motivate people’s decision-making and predict whether they make a personally satisfying choice or delay making a choice.

As with most human actions, Janis and Mann stated that some level of arousal or in their terms, conflict, is required before people have enough impetus or motivation to make a decision. They hypothesised that moderate amounts of decisional conflict motivate people to find a rational or “optimal” outcome to the decision but high levels of decisional conflict can impede people’s ability to make decisions. This hypothesised non-linear relationship between decisional conflict and decision-making can be seen to reflect Yerkes and Dodson’s (1908) inverted-U
performance-arousal relationship although such a proposition has not been tested. This decisional conflict can also be viewed as decision-making stress.

There is a large body of research on the impact of decisional conflict on patients’ decision-making with respect to different medical treatments. For example, Rini et al. (2009) explored the impact of decisional conflict in women who needed to decide how to manage their breast cancer risk following a positive BRCA1/2 breast cancer test. They found that women who make a decision at or before their 1-month follow up appointment experienced the least amount of decisional conflict, compared with women who delayed their decision-making until their 6-month follow up appointment. Women who delayed making their decision until their 12-month follow up appointment experienced the most decisional conflict. The direction of the relationship between these factors, that is, delay in making a decision leading to decision conflict or decisional conflict leading to a delay in making a decision was not expressly stated. Yet on balance, it would seem that these results support elements of Janis and Mann’s (1977) Conflict Theory, wherein they hypothesised that people who delay their decision-making experience the most decisional conflict.

Knops et al. (2013) also explored the decisional conflict reported by inpatients who were required to decide between treatment options. They found that for every unit increase in decisional conflict the likelihood of patients delaying making their decision increased by four per cent or, conversely, decreased decisional conflict led to decreased delay in making a decision. Again the direction of the relationship between these factors was not expressly stated; however these results also seem to support Janis and Mann’s hypothesis that people are more likely to delay their decision-making as decisional conflict increases.
While the literature suggests that decisional conflict appears to have an impact on whether a decision is made or delayed, Janis and Mann (1977) also stated that people could experience negative affect associated with their conflict as part of an overall feeling of stress. Feldman-Barrett (1998) described affect as occupying two orthogonal dimensions: (1) valence – the subjective feeling of pleasantness or unpleasantness, and (2) arousal – the subjective state of feeling motivated or unmotivated. Fear, for example, lies on the unpleasant end of the valence dimension and could lie on either the motivated or unmotivated end of the arousal dimension depending on the situation. Tomkins and McCarter (1964) stated that “affective responses are the primary motives of human beings” (p. 119) and they directed people “to explore and to attempt to control the circumstances that evoked [their] positive and negative affective responses…[and] implicitly or explicitly entails the maximizing [sic] of positive affect and the minimizing [sic] of negative affect” (Tomkins, 2014, p. 167). This motivational effect seems to reflect that of conflict when making decisions. It may be that people’s affect and the components of decisional conflict described by Janis and Mann (1977) are the main contributors to people’s overall experience of decision-making stress (Figure 5.1).

Figure 5.1. Schematic diagram of the proposed components of decision-making stress (decisional conflict and affect). Signs (+ and −) indicate the direction of the effect
There is a bias however, for conflict-based decision researchers and stress and coping researchers generally to focus on the effects of negative affect. It may also be positive affect, the other end of Feldman-Barrett’s (1988) affect dimension, which has an impact on people’s decision-making. Certainly Folkman and Moskowitz (2000), Folkman (2008), and Greenglass and Fiksenbaum (2009) all argued for the inclusion of positive affect as an indicator of the stress people experience. While the role of positive affect warrants investigation, it should not be at the expense of negative affect. Indeed D. Watson, Clark, and Tellegen (1988) argued against a bipolar conceptualisation of affect in favour of two, unipolar constructs of positive affect and negative affect. Empirical testing of the effect of affect in any proposed model would therefore be enhanced by the inclusion of both positive and negative affect as two separate indicators of decision-making stress in addition to the conflict-related indicators.

Consistent with Janis and Mann’s (1977) Conflict Theory, a model would need to include the residual decision-making stress people might experience after they have made a decision. This residual decision-making stress can be seen as synonymous with decision satisfaction (Janis & Mann, 1977), which is discussed next.

**Decision Satisfaction**

It is common for research on decision satisfaction to not contain an explicit conceptualisation or definition of it. Decision satisfaction is often inferred from other terms such as “residual decisional conflict” (Janis & Mann, 1977) and a person feeling that they have made an “informed” (Vlemmix et al., 2013) or an “effective” (O'Connor, 1995) decision. In each instance, as the perceived gap between the actual
decision made and a subjective “ideal” decision is minimised, there is a reduction in the level of post-decisional conflict experienced.

What are the components of such a subjective “ideal” decision? From a conflict perspective, O’Connor (1995) stated that ideal decisions are informed by all relevant information and are consistent with the decision-maker’s personal values which are unlikely to change, at least in the immediate time interval. Furthermore, O’Connor stated that making an ideal decision is synonymous with making an effective decision and therefore it can be argued to also reflect decision satisfaction. She characterised the decision satisfaction associated with making an ideal decision as when the actual decision is: (1) consistent with the decision-maker’s values, (2) unlikely to be changed, and (3) associated with a lack of post-decisional conflict or stress.

In line with this conceptualisation of decision satisfaction, Keng and Liao (2009) found post-purchase conflict negatively predicted people’s satisfaction with their purchase and also their intention not to purchase the same or a similar product in the future. Post-purchase conflict also was strongly, positively predictive of the likelihood of complaining to a relative or friend about the product as well as searching for information and feedback about the product from the internet, family, and friends. These findings support the contention that post-decisional conflict is negatively related to decision satisfaction and can have an impact on people’s future decision-making related to the same product or the same decision context.

Conversely, in a sample of women faced with decisions regarding their treatment for breast cancer, Kokufu (2012) found reduced levels of decisional conflict led to increased levels of decision satisfaction. Also, in a sample of adults with cystic fibrosis considering a referral for lung transplantation, Vandemheen et al.
found increases in participants’ decision satisfaction was positively predictive of decreases in their decisional conflict. These results provide empirical support for a link between decision-making stress, albeit in terms of decisional conflict, and decision satisfaction (Figure 5.2).

While there is empirical support for the impact of decision-making stress on whether people delay their decision-making, or make a decision reasonably promptly, and their satisfaction post the decision, it is not clear what predicts decision-making stress. Janis and Mann (1977) asserted that it is how people appraise the decision, for example whether people judge that they enough resources such as the time in which to make a decision, and these appraisals are discussed next.

**Decision Appraisals**

Research related to the role of appraisals in decision-making has been limited to the effect of one or two types of appraisals. For instance, Cooper-Martin (1994) explored the impact of effort appraisals on decision-making, while Maule, Robert, Hockey, and Bdzola (2000) explored the impact of time appraisals on decision-making. Lerner and Keltner (2000) also explored the impact of personal control and decision certainty appraisals on decision-making. As these researchers focused on only one or two types of decision appraisals the concurrent effect of multiple decision appraisals, such as those proposed in Janis and Mann’s (1977) Conflict Theory, on decision-making has not been tested fully.

Janis and Mann (1977) argued that people’s feelings of decisional conflict or stress are primarily determined by four appraisals: (1) are the risks serious if I don’t change? (2) are the risks serious if I do change? (3) is it realistic to hope to find a better solution? and (4) is there sufficient time to search and deliberate? The first two questions are to some degree echoed in Lazarus and Folkman’s (1984) later
Figure 5.2. Schematic diagram of the proposed relationship between decision-making stress and decision satisfaction. Bolded variables and paths indicate new factors added to the schematic diagram from Figure 5.1. Signs (+ and −) indicate the direction of the effect.
Transactional Theory of Stress and Coping where they defined primary appraisals as cognitive evaluations of the demand placed on the person by the situation: In this case, is there an imperative to make a decision? Janis and Mann’s third and fourth questions can also be seen to reflect Lazarus and Folkman’s description of secondary appraisal, that is the resources available to meet the demands of the situation, in this instance, knowledge of possible options and time. It can be argued that the person’s acknowledgement of their need to make a decision is in fact their primary appraisal per se. It would then be the person’s secondary appraisal of the resources available to them to make their decision that has an impact on their level of decision-making stress.

Janis and Mann argued that people could start to experience decisional conflict or stress after they appraise the need to make a decision. As the importance or impact of the decision increases, the person’s willingness or urgency to engage in decision-making also increases so too might their level of decision-making stress. If the third and fourth appraisals: (3) is it realistic to hope to find a better solution? and (4) is there sufficient time to search and deliberate? are able to be answered positively, then this would decrease the person’s level of decision conflict. In contrast, Janis and Mann argued that as people’s appraisal of their ability to find the solution to the decision decreased, along with the amount of time available to decide, the intensity of the person’s decisional conflict would also increase.

Janis and Mann (1977) also argued that people appraise their general ability to cope with making the decision, which they termed an appraisal of their decision self-esteem. This type of appraisal might also be considered a generalised, though decision-making specific, form of Lazarus and Folkman’s (1984) secondary appraisal. A person’s appraisal of their decision-self esteem, or general ability to
cope with making the decision, may also be indicative of one of Hobfoll’s (1989) internal resources which he argued people utilise to deal with stress.

To this end, Okwumabua, Wong, and Duryea (2003) found significant, negative correlations between self-reported symptoms of depression and appraisals of decision self-esteem in their sample of African-American students, although the effect sizes were very low. When they split the sample by age cohort: 12-13, 14-15, and 16-17 years, the significant correlations and low effect sizes remained indicating that these findings were constant across these adolescent cohorts.

Similarly, in sample of female adolescents, Commendador (2011) found a significant, negative correlations between appraisals of decision self-esteem and the use of a complacent and a panic decision-making style. Conversely, a positive correlation was present between appraisals of decision self-esteem and participants who reported a vigilant pattern of coping with decision-making. The effect sizes for each of these correlations were low. This focus on one type of appraisal, particularly when the effect of that appraisal on people’s decision-making is small, could be considered a limitation in the exploration of people’s decision-making stress and decision satisfaction. Rather it is suggested that such a model include appraisals of: (1) people’s general ability to cope with making the decision and (2) the specific resources available to make a decision, both of which are central to Janis and Mann’s (1977) Conflict Theory (Figure 5.3). The types of decisional coping strategies people use to reduce their decision-making stress and which may increase the likelihood of making a choice with which they are satisfied will be discussed next.
Figure 5.3. Schematic diagram of the proposed relationships between decision appraisals, decision-making stress, and decision satisfaction. Bolded variables and paths indicate new factors added to the schematic diagram from Figure 5.2. Signs (+ and –) indicate the direction of the effect.
Decisional Coping Strategies

Festinger (1957) stated that people are driven to reduce any dissonance-related stress by changing or justifying their actions or thoughts about the situation that triggered the stress. People will shift between strategies until the dissonance-related stress is reduced to a subjectively evaluated, “acceptable” level where people feel they can manage the situation at hand. This position was paralleled later by Janis and Mann (1977) in their Conflict Theory and, in the broader area of coping research (e.g., J. R. Edwards, 1992; Frydenberg, 2014; Pearlin & Schooler, 1978), where the aim of coping is to reduce feelings of stress, manage the stressor itself, and in some instances or for some people avoiding the stressor altogether.

Empirical research on how people cope with decision-making stress has waned in favour of understanding the processes or strategies people use to make their decisions (Balneaves & Long, 1999). These decision strategies however, might also be considered types of coping strategies people utilise to reduce their decision-making stress and increase their decision satisfaction. For example, the Type 2, normative-based decision strategies described in dual-process models of decision-making (Evans, 2011), such as assessing the pros and cons of the situation and seeking new information (Osman, 2004), are not dissimilar to what Lazarus and Folkman (1984) considered as problem-focused coping.

Similarly, Simon’s (1959, 1979) satisficing process, whereby people make a “good enough” decision that may involve changing their expectations about what a good decision is, could be likened to what Pearlin, Menaghan, Lieberman, and Mullan (1981) and J. R. Edwards (1992) stated were coping strategies directed at modifying one’s expectations about a stressor such as the need to make a decision. Given these similarities the three types of coping strategies: (1) changing the
situation, (2) changing expectations, and (3) the emotion-focused strategy of avoiding the situation, which are also dominant in the broader coping literature, might have an impact on reducing people’s decision-making stress and increasing their decision satisfaction. This proposition is worthy of empirical investigation.

In addition, the use of social resources may be a way by which people proactively cope with decision-making stress. Greenglass and Fiksenbaum (2009) found increased use of social resources predicted increases in people’s ability to proactively cope with competing work demands, feelings of positive affect, and general wellbeing. Similarly, in a sample of breast cancer survivors, McDonough, Sabiston, and Wrosch (2014) found that the use of social resources predicted increases in participants’ subjective wellbeing and growth post a trauma. Davis and Brekke (2014), in a study of people with a severe mental illness, also found that the use of social resources predicted increases in participants’ proactive coping ability and social role functioning. It may be the use of social resources will also reduce people’s decision-making stress and increase their decision satisfaction (Figure 5.4).

**Metacognitive Awareness and Acceptance**

Some of the more recent CBTs such as ACT include strategies to cultivate people’s metacognitive awareness and acceptance of their thoughts and feelings (Hayes, Villate, Levin, & Hilderbrandt, 2011). These metacognitions are then directed at supporting people in making meaningful decisions in the way they think, feel, and behave that is more psychologically flexible (Hayes et al., 2006). Empirical research to date has largely supported the positive effects of metacognitive awareness and acceptance on people’s lives. One of the specific research foci in the literature is whether metacognitive awareness reduces anxiety.

For instance, in a sample of university students, participants’ levels of
Figure 5.4. Schematic diagram of the proposed relationships between decisional coping strategies (change the situation, change expectations, avoid the decision, and use social resources) decision appraisals, decision-making stress, and decision satisfaction. Bolded variables and paths indicate new factors added to the schematic diagram from Figure 5.3. Signs (+ and –) indicate the direction of the effect.
metacognitive awareness predicted lower levels of social anxiety as measured by fear and avoidance of social interactions. Also using a sample of university students, Pearson, Brown, Bravo, and Witkiewitz (2014) found metacognitive awareness decreased anxiety. Pearson et al. also found that metacognitive awareness indirectly predicted lower levels of depression and alcohol-related problems, such as saying things while intoxicated that are later regretted, to increases in a sense of purpose in life.

Furthermore, Mohlman (2009) found metacognitive awareness predicted lower levels of anxiety and depression in people who received a first diagnosis of age-related hearing loss. Lau et al. (2006) also found lower levels of general stress in people with higher levels of metacognitive awareness. It might be that metacognitive awareness has a role in decreasing the level of anxiety and stress people experience when making decisions. These results, while only a few examples, highlight the growing trend within the literature that show a positive impact for metacognitive awareness.

Research on metacognitive acceptance mainly supports a positive relationship with people’s proactive coping behaviours. For example, Chapman, Gratz, and Brown (2006) found that when participants stress levels increased, their metacognitive acceptance was reduced and this reduction lead to an increased use of emotion-focused coping behaviours, in this instance deliberate self-harm to escape from their stressful feelings. Masuda, Price, Anderson, and Wendell (2010) also found metacognitive acceptance to be related inversely to the frequency of cognitions reinforcing eating disorder behaviours and general psychological ill-health. While there are several reports of the positive effects of increased
metacognitive awareness and acceptance, there is a gap in the literature regarding the potential role of these metacognitions in people’s decision-making.

Janis and Mann (1977) argued that people’s decision-making stress would initiate the use of decisional coping strategies, which are then directed at reducing their stress. The reciprocal effects of these variables may also be experienced indirectly. In this instance, it may be that people’s decision-making stress contributes indirectly to an increased use of decisional coping strategies though their metacognitive acceptance. The increase in people’s use of decisional coping strategies might, in turn, increase their metacognitive awareness as they try to cope with the situation, which then decreases the level of their decision-making stress (Figure 5.5).

The proposed relationships between appraisals, stress, coping, satisfaction, and the inclusion of metacognitive awareness and acceptance reflect a novel approach to understanding people’s decision-making and satisfaction. The validity of the proposed Cognitive-Affective Model of Decision-Making Stress and Satisfaction will be explored in this thesis.
Figure 5.5. Schematic diagram of the relationships between metacognitive awareness and acceptance, decision appraisals, decision-making stress, decisional coping strategies, and decision satisfaction. Bolded variables and paths indicate new factors added to the schematic diagram from Figure 5.4. Signs (+ and –) indicate the direction of the effect.
Chapter Summary

A model of people’s decision-making stress and satisfaction was proposed based upon the elements of Janis and Mann’s (1977) Conflict Theory and Lazarus and Folkman’s (1984) Transactional Model of Stress and Coping, and incorporated recent developments with respect to metacognitions, in particular, metacognitive awareness and acceptance. The relevance of secondary appraisals and the role of both positive and negative affect on decision-making stress and coping were considered in addition to their indirect effects on decision satisfaction.
CHAPTER SIX

Thesis Aims

The aim in this thesis was to test the Cognitive-Affective Model of Decision-Making Stress and Satisfaction developed from the literature (Figure 5.5). The model reflects an integration of the decision-making and stress and coping literature, specifically Janis and Mann’s (1977) Conflict Theory and Lazarus and Folkman’s (1984) Transactional Model of Stress and Coping. Recent developments in cognitive psychology on metacognitive awareness and acceptance were also incorporated into the model to predict people’s satisfaction with their decision. Positive affect, as well as negative affect, was also included in the model as Folkman and Moskowitz (2000) and Folkman (2008) have argued that it is important to consider both measures of affect given that low negative affect does not necessarily equate to high positive affect (D. Watson et al., 1988).

A repeated measures design was used to test the model over three separate phases to determine its stability across different types of decisions or to determine any cross-context variations (Figure 6.1). The three types of decisions will be related to people’s occupation or study, their family or relationship, and to their physical or mental health.
Figure 6.1. Outline of the longitudinal study proposed to test the aims in this thesis.
Aims and Hypotheses

The aim in Phase One of this repeated measures study is to test the proposed Cognitive-Affective Model of Decision-Making Stress and Satisfaction developed from the literature (Figure 6.1) with respect to a decision participants have made related to their occupation or study within the past six months. In order to test the theoretical model, it was operationalised as shown in Figure 7.1.
Figure 7.1. The operationalised version of the proposed Cognitive-Affective Model of Decision-Making Stress and Satisfaction to be tested in the First Phase of the Repeated-Measures Design.

The signs (+ and -) indicate the direction of the effects to be tested.
Method

Design

The first phase of this 3-phase repeated-measures design is a survey to test the hypothesised model in relation to a decision participants had made recently related to their occupation or study.

Participants

A convenience sample of 182 adults (27 males, $M_{age} = 36.04$ years; $SD = 9.92$; 147 females, $M_{age} = 41.33$ years; $SD = 12.25$; and eight participants who did not indicate their gender, $M_{age} = 39.75$ years; $SD = 12.65$) participated in the study. An independent samples \(t\)-test indicated male participants were significantly younger than female participants ($t_{172} = 2.12$, \(p = .03\)). Despite the imbalance in numbers between those participants who indicated their gender and those who did not, a Mann-Whitney \(U\)-test revealed no significant difference in age between those who did and did not indicate their gender (Mann-Whitney \(U = 86.00\), \(p = .40\)).

Procedure

Ethical approval for the conduct of this study was obtained from the Charles Darwin University Human Research Ethics Committee (CDU-HREC; Appendix A.1). Participants were recruited by two means: (1) a notice advertising the study was posted on the online learning portal used by students of the university, and (2) notices were posted on the online social networking site, Facebook. The notices contained an invitation to participate in a study looking at factors influencing a decision potential participants had made recently related to their occupation or study (Appendix B.1). The notice contained a web link to the online survey: (http://cduhes.asia.qualtrics.com/SE/?SID=SV_6R3J2Ea4hKCB68Q), as well as a
request for them to share the web link with their Facebook friends, email contacts, and other students at the university.

The web site contained a Plain Language Statement (Appendix B.2) outlining the requirements of participation and advice to participants that they could withdraw from the study at any time by simply closing their web browser. They were also advised that completion and submission of the online survey (Appendix B.3) would be deemed to be their informed consent to participate in the study. No incentives were offered for participation in the study. No response rate could be calculated due to the method of recruitment.

At the completion of the online survey participants were asked if they were willing to complete the online survey a second time one month later while reflecting on a different decision. Those participants who consented to completing the second online survey were then asked to provide a six-letter code consisting of the first three letters of their parents’ names. For example if the participant’s parents’ names were Mary and John then their six-letter code was MARJOH. This six-letter code, along with participants’ gender and age, will be used to match their responses across the three phases of this longitudinal study and it was submitted along with their responses from the current phase. These participants were then directed to an independent online survey form where they were asked to provide their email address twice, to overcome any typographical mistakes. At no time was it possible to link these email addresses to the participants’ original responses. Those participants who did not consent to complete the online survey a second time were asked to submit their responses from the current phase and thanked for their time.
Scale Development

In the absence of available scales to assess Janis and Mann’s (1977) decision appraisals or Schraw and Dennison’s (1994) metacognitive awareness, items to assess these factors were developed for use in this thesis. Four items (e.g., I thought that there was enough time to make the decision; Appendix B.3) were written to assess participants’ appraisal of their general ability and the specific resources available to them to assist them in making their decision. These items are answered on a five-point Likert scale ranging from 1 (Not at All) to 5 (Extremely).

A further five items (e.g., I was aware of my thoughts and how I was thinking at that time; Appendix B.3) were written to assess people’s metacognitive awareness, that is people’s awareness of their thought processes while contemplating the decision to be made. These items are answered on a five-point Likert scale ranging from 1 (Not at All) to 5 (Extremely).

Materials

All participants were required to provide demographic information on their age, gender, marital status, and whether or not they were employed or engaged in study. In addition, participants were invited to complete the two scales designed for this thesis as well as the following measures.

The Acceptance and Action Questionnaire, Version II, (AAQ-II; Bond et al., 2011) is a seven-item measure of experiential or metacognitive acceptance (e.g., My painful experiences and memories [do not] make it difficult for me to live a life that I would value) answered on a seven-point Likert scale ranging from 1 (Never True) to 7 (Always True). The AAQ-II has strong internal reliability (Cronbach’s α = .86). In the current study, only the five items with the highest factor loadings were included for parsimony and item wording was edited to reflect the past tense and a decision-
making context (e.g., My painful experiences and memories [did not] make it
difficult for me [to make a decision] that I would value).

The Decisional Conflict Scale (DCS; O'Connor, 1995) is a 16-item scale of
five factors: (1) Uninformed (e.g., I [do not] know which options are available to
me), (2) Unclear Values (e.g., I am [not] clear about which benefits matter most to
me), (3) Not supported (e.g., I [do not] have enough support from others to make a
choice), (4) Uncertain (e.g., I am [un]clear about the best choice for me), and (5)
Effective Decision (e.g., I am satisfied with my decision.). The items are rated on a
five-point Likert scale ranging from 1 (Strongly Agree) to 5 (Strongly Disagree). The
items in the first four subscales are reverse coded and were utilised as indicators of
decision-making stress; items on the Effective Decision subscale were used as an
indicator of decision satisfaction. Internal reliabilities of the subscales are strong.
Cronbach’s $\alpha = .85$ to $\alpha = .93$.

The International Positive and Negative Affect Schedule Short Form (I-
PANAS-SF; E. R. Thompson, 2007) is a 10-item scale of two factors: (1) positive
affect (e.g., I felt excited), and (2) negative affect (e.g., I felt afraid). Items are rated
on a five-point Likert scale ranging from 1 (Never) to 5 (Always). Internal reliability
of each subscale is good, Cronbach’s $\alpha = .78$ and $\alpha = .76$, respectively.

The Cybernetic Coping Scale-15 (CCS-15; Guppy et al., 2004) is a 15-item
scale of five factors, with: (1) Change the Situation (e.g., I work on changing the
situation to get what I want), (2) Accommodation/Change Expectations (e.g., I try to
adjust my expectations to meet the situation), and (3) Avoidance (e.g., I try to avoid
thinking about the problem) used in the current study. Each subscale has three items
rated on a five-point Likert scale ranging from 1 (Do not use at all) to 5 (Use very
much). In the current study, item wording was edited to reflect the decision-making
context (e.g., I tried to adjust my expectations to [make the decision]). Internal reliability of each subscale is good, Cronbach’s $\alpha = .69$ to $\alpha = .81$.

The Use of Social Resources subscale of the Deakin Coping Scale (USR-Deakin; Moore, 2003) is a four-item scale (e.g., discussed [the decision] with my friends and colleagues) answered on a five-point Likert scale ranging from 1 (Never) to 5 (Always), and has strong internal reliability, Cronbach’s $\alpha = .88$.

In the current study, all items were written in the past tense. All measures were scored so that higher scores indicated higher levels of the variable (e.g., higher scores on the AAQ-II indicated higher levels of metacognitive acceptance). Participants were required to answer all items in terms of a decision they had made in the previous six months that was related to their occupation or study.

**Results**

The data were analysed using the Statistical Package for Social Sciences (SPSS; Version 22) and the structural equation modelling software, AMOS (Version 7). The statistical analyses were conducted in three phases: (1) descriptive statistics of the demographic data, (2) principal components and internal reliability analyses to determine the factor structure and internal reliability of the new scales of decision appraisals and metacognitive awareness in decision-making, and (3) structural equation modelling to test the hypothesised Cognitive-Affective Model of Decision-Making Stress and Satisfaction.

**Demographics**

The majority of participants were married/living with a partner (60.5% - female participants, 55.6% - male participants, and 50% - no gender reported). There was no association between participants’ gender and marital status (Table 7.1).
Table 7.1

**Participants’ Marital Status by Gender**

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Gender</th>
<th></th>
<th></th>
<th>Cramer’s $V$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female $n$ (%)</td>
<td>Male $n$ (%)</td>
<td>NK $n$ (%)</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>39 (26.5)</td>
<td>12 (44.4)</td>
<td>3 (37.5)</td>
<td></td>
</tr>
<tr>
<td>Married/Living Together</td>
<td>89 (60.5)</td>
<td>15 (55.6)</td>
<td>4 (50.0)</td>
<td></td>
</tr>
<tr>
<td>Divorced</td>
<td>17 (11.6)</td>
<td>-</td>
<td>1 (12.5)</td>
<td>5.87 .18</td>
</tr>
<tr>
<td>Widowed</td>
<td>1 (.7)</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>147 (100.0)</td>
<td>27 (100.0)</td>
<td>8 (100.0)</td>
<td></td>
</tr>
</tbody>
</table>

NK = Not known.

The majority of participants were employed (78.9% of the female participants, 85.2% of the male participants, and 87.5% of those participants who did not indicate their gender). A Pearson’s $\chi^2$ test indicated no association between participants’ gender and the context of the decision (Table 7.2) but clearly most participants reflected upon a decision related to their occupation.

Table 7.2

**Participants’ Occupation/Study Status by Gender**

<table>
<thead>
<tr>
<th>Occupation/Study Status</th>
<th>Gender</th>
<th></th>
<th></th>
<th>Cramer’s $V$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female $n$ (%)</td>
<td>Male $n$ (%)</td>
<td>NK $n$ (%)</td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td>116 (78.9)</td>
<td>23 (85.2)</td>
<td>7 (87.5)</td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>31 (14.8)</td>
<td>4 (14.8)</td>
<td>1 (12.5)</td>
<td>.56 .06</td>
</tr>
<tr>
<td>Total</td>
<td>147 (100.0)</td>
<td>27 (100.0)</td>
<td>8 (100.0)</td>
<td></td>
</tr>
</tbody>
</table>

NK = Not known

**Principal Components and Internal Reliability Analyses**

Principal Components Analyses (PCAs) with oblique rotations were conducted on participants’ responses to the four items written to assess secondary
decision appraisals and the five items written to assess metacognitive awareness in decision-making.

Inspection of histograms, box plots, and skewness, kurtosis, and Shapiro-Wilk statistics for the four items of decision appraisals revealed approximate item normality. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (KMO = .73) and Bartlett’s Test of Sphericity (Approximate $\chi^2_6 = 144.10, p < .001$) both indicated the factorability of the correlation matrix.

The PCA revealed one factor with an eigenvalue greater than unity. Cattell’s scree plot, Tabachnick and Fidell’s (2007) criteria of choice, also indicated the presence of one factor. This factor accounted for 54.07% of the total variance and was labelled Decision Appraisals. Internal reliability analysis revealed Cronbach’s alpha = .69 (Table 7.3).

Table 7.3

*Standardised Factor Loadings, Eigenvalue, Variance Explained, and Descriptive Statistics of the Decision Appraisals Scale (DAS) in an Occupation/Study Context*

<table>
<thead>
<tr>
<th>Item</th>
<th>Decision Appraisals</th>
</tr>
</thead>
<tbody>
<tr>
<td>I thought that…</td>
<td></td>
</tr>
<tr>
<td>I was able to cope with making the decision</td>
<td>.82</td>
</tr>
<tr>
<td>I had the effort/energy needed to make the decision</td>
<td>.80</td>
</tr>
<tr>
<td>I was able to find the best solution to the decision</td>
<td>.74</td>
</tr>
<tr>
<td>There was enough time to make the decision</td>
<td>.53</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>2.16</td>
</tr>
<tr>
<td>% Variance Explained</td>
<td>54.07</td>
</tr>
<tr>
<td>$M$</td>
<td>18.40</td>
</tr>
<tr>
<td>$SD$</td>
<td>2.58</td>
</tr>
<tr>
<td>$\alpha$</td>
<td>.69</td>
</tr>
</tbody>
</table>
Inspection of histograms, box plots, and skewness, kurtosis, and Shapiro-Wilk statistics for the five items of metacognitive awareness revealed approximate item normality. The KMO measure of sampling adequacy (KMO = .82) and Bartlett’s Test of Sphericity (Approximate $\chi^2_{10} = 277.81, p < .001$) both indicated the factorability of the correlation matrix.

The PCA revealed one factor with an eigenvalue greater than unity. Cattell’s scree plot also indicated the presence of one factor. This factor accounted for 57.32% of the total variance and was labelled Metacognitive Awareness. Internal reliability analysis revealed Cronbach’s alpha = .81 (Table 7.4).

Table 7.4

<table>
<thead>
<tr>
<th>Item</th>
<th>Metacognitive Awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td>I was aware of my thoughts and how I was thinking at that time</td>
<td>.82</td>
</tr>
<tr>
<td>I was aware of how I was evaluating the options available to me</td>
<td>.78</td>
</tr>
<tr>
<td>I was conscious of my thinking at that time</td>
<td>.76</td>
</tr>
<tr>
<td>I monitored my thinking constantly</td>
<td>.73</td>
</tr>
<tr>
<td>I paid close attention to my thoughts about each available option</td>
<td>.69</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>2.87</td>
</tr>
<tr>
<td>% Variance Explained</td>
<td>57.32</td>
</tr>
<tr>
<td>$M$</td>
<td>18.16</td>
</tr>
<tr>
<td>$SD$</td>
<td>3.54</td>
</tr>
<tr>
<td>$\alpha$</td>
<td>.81</td>
</tr>
</tbody>
</table>
Correlation Matrix

Pearson Product-Moment Correlations were calculated for all summated factors in the model (Table 7.5). The analysis revealed that Use of Social Resources did not correlate greater than \( r = .30 \) with the other decisional coping strategies or with decision satisfaction and was removed from further analyses. The other decisional coping strategies were significantly correlated with each other. The decision-making stress factors were also significantly inter-correlated.

Measurement Model

The data were analysed initially for their goodness of fit against the measurement model (Kline, 2005). In order to identify the measurement model, the error variances of MAS, AAQII, DAS, and the manifest Decision Satisfaction variable were constrained according to Bollen’s (1989) recommendations\(^1\) for single-indicator latent variables.

The independent Chi-square confirmed there were significant relationships among the variables in the model, \( \chi^2_{\text{indep}} = 702.56, p < .001 \), but the overall \( \chi^2 \) did not support the fit of the data to the measurement model, \( \chi^2_{43} = 122.34, p < .001 \); Relative \( \chi^2 (\chi^2/df) = 2.84 \); Goodness of Fit Index (GFI) = .90; Tucker-Lewis Index (TLI) = .81; Comparative Fit Index (CFI) = .87; Root Mean Square Error of Approximation (RMSEA) = .10; Probability of Close Fit (p/close) < .001; Standardised Root Mean Square Residual (SRMR) = .09.

The modification indices indicated several statistical modifications that could be made which would result in a significant improvement in the fit of the data to the measurement model. These modifications were considered for their theoretical

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\(^1\) Bollen (1989) recommended such error variances be constrained to: \( (1 - \alpha)s^2 \left(1 - \alpha\right)s^2 \) where \( \alpha = \) Cronbach’s alpha coefficient of the relevant manifest variable, and \( s^2 = \) variance of the relevant manifest variable.
Table 7.5

Pearson Product-Moment Correlation Coefficients (r) for Metacognitive Awareness, Metacognitive Acceptance, Decision Appraisals, Decision-Making Stress (Uninformed, Values Unclear, Unsupported, Uncertain, Negative Affect, and Positive Affect), Decisional Coping Strategies (Change Situation, Change Expectations, Avoid Decision, Use Social Resources), and Decision Satisfaction in an Occupation/Study Context.

<table>
<thead>
<tr>
<th>MAS</th>
<th>AAQII</th>
<th>DAS</th>
<th>Uninformed</th>
<th>Values Unclear</th>
<th>Unsupported</th>
<th>Uncertain</th>
<th>Negative Affect</th>
<th>Positive Affect</th>
<th>Change Situation</th>
<th>Change Expectations</th>
<th>Avoid Decision</th>
<th>Use Social Resources</th>
<th>Decision Satisfaction</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
<td>(8)</td>
<td>(9)</td>
<td>(10)</td>
<td>(11)</td>
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<td>2.</td>
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<td>-0.03</td>
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<td>-0.35***</td>
<td>-0.39***</td>
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<td>4.</td>
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<td>-0.32***</td>
<td>-0.38***</td>
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</tr>
<tr>
<td>5.</td>
<td>-0.21***</td>
<td>-0.24***</td>
<td>-0.44***</td>
<td>0.43***</td>
<td>0.41***</td>
<td>1</td>
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<tr>
<td>6.</td>
<td>-0.18*</td>
<td>-0.49***</td>
<td>-0.55***</td>
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<td>7.</td>
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<td>-0.42***</td>
<td>0.19*</td>
<td>0.13</td>
<td>0.19***</td>
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<tr>
<td>8.</td>
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<td>0.32***</td>
<td>0.44***</td>
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<td>-0.40***</td>
<td>-0.21**</td>
<td>-0.47***</td>
<td>-0.21***</td>
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<tr>
<td>9.</td>
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<td>0.02</td>
<td>-0.08</td>
<td>-0.24**</td>
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<td>-0.10</td>
<td>0.16*</td>
<td>0.27***</td>
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<td>0.08</td>
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<td>0.02</td>
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<td>0.06</td>
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<td>11.</td>
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<td>-0.41***</td>
<td>-0.22**</td>
<td>0.20*</td>
<td>0.21**</td>
<td>0.13</td>
<td>0.23**</td>
<td>0.42***</td>
<td>-0.17</td>
<td>0.17</td>
<td>0.29***</td>
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<td>12.</td>
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<td>0.02</td>
<td>-0.01</td>
<td>-0.07</td>
<td>-0.42***</td>
<td>0.02</td>
<td>0.09</td>
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<td>0.13</td>
<td>0.04</td>
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</tr>
<tr>
<td>13.</td>
<td>-0.22**</td>
<td>-0.35***</td>
<td>0.52***</td>
<td>-0.43***</td>
<td>-0.49***</td>
<td>-0.41***</td>
<td>-0.55***</td>
<td>-0.31***</td>
<td>0.51***</td>
<td>0.13</td>
<td>-0.01</td>
<td>-0.18**</td>
<td>-0.18*</td>
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<td>14.</td>
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<td>0.80</td>
<td>0.69</td>
<td>0.78</td>
<td>0.85</td>
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<td>0.80</td>
<td>0.82</td>
<td>0.81</td>
<td>0.83</td>
<td>0.69</td>
</tr>
</tbody>
</table>

MAS = Metacognitive Awareness Scale; DAS = Decision Appraisals Scale; AAQII = Acceptance and Action Questionnaire, Version II.
*p < .05; **p < .01; ***p < .001
relevance (e.g., Positive Affect → Change Situation) and, following Bollen’s recommendation, those considered relevant were added to the measurement model one at a time. Negative Affect was removed from the final measurement model, as it was not a significant indicator of decision-making stress as originally hypothesised (Table 7.6).

The correlations between decision satisfaction and decision-making stress, and decision appraisals and decision-making stress while all were in the hypothesised negative direction, were indicative of a level of multicollinearity. The final measurement model however provided a good fit of the data to that model and so the components were considered suitable for structural equation modelling. The modifications made to the measurement model were incorporated into the hypothesised Cognitive-Affective Model of Decision-Making Stress and Satisfaction prior to testing.
Table 7.6

*Goodness of Fit Statistics for the Final Measurement Model in an Occupation/Study Context*

<table>
<thead>
<tr>
<th></th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>$\chi^2/df$</th>
<th>GFI</th>
<th>TLI</th>
<th>CFI</th>
<th>RMSEA</th>
<th>$p$/close</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesised Measurement Model</td>
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<td>&lt; .001</td>
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<td>.90</td>
<td>.81</td>
<td>.87</td>
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<td>&lt; .001</td>
<td>.09</td>
</tr>
<tr>
<td>Paths Added</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Affect → Change Situation</td>
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<td>42</td>
<td>&lt; .001</td>
<td>2.43</td>
<td>.91</td>
<td>.85</td>
<td>.91</td>
<td>.09</td>
<td>.003</td>
<td>.07</td>
</tr>
<tr>
<td>Uninformed → Values Unclear</td>
<td>70.62</td>
<td>41</td>
<td>.003</td>
<td>1.72</td>
<td>.94</td>
<td>.92</td>
<td>.95</td>
<td>.06</td>
<td>.18</td>
<td>.06</td>
</tr>
<tr>
<td>Path Removed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decision-Making Stress → Negative Affect&lt;sup&gt;a&lt;/sup&gt;</td>
<td>86.62</td>
<td>51</td>
<td>&lt; .001</td>
<td>1.70</td>
<td>.93</td>
<td>.93</td>
<td>.95</td>
<td>.06</td>
<td>.18</td>
<td>.05</td>
</tr>
</tbody>
</table>

*Note.* GFI = Goodness-of-Fit Index; TLI = Tucker-Lewis Index; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; $p$/close = probability of close fit; SRMR = Standardised Root Mean Square Residual.

<sup>a</sup> Negative Affect was removed from the final measurement model as it was not a significant indicator of decision-making stress as originally hypothesised. The final goodness of fit statistics reflect these changes.
Figure 7.2. Final measurement model within an occupation/study context showing standardised, predictive pathways (β) and correlations (r).
MAS = Metacognitive Awareness Scale; AAQII = Acceptance and Action Questionnaire, Version II; DAS = Decision Appraisals Scale.
*p < .05; **p < .01; ***p < .001
Model Testing

The revised model, with negative affect removed and paths added from positive affect to change the situation and from uninformed to values unclear, was tested in relation to a decision people had made about their occupation or study, using the structural equation modelling software, AMOS (Version 7).

**Goodness of Fit Indices and Explained Variances.** The $\chi^2_{\text{indep}}$ confirmed there were significant relationships among the variables in the model, $\chi^2_{\text{indep}} = 702.56, p < .001$. While $\chi^2$ was significant, $\chi^2_{46} = 79.17, p = .002$, all other fit indices including the $\chi^2/df = 1.72$; GFI = .93; TLI = .92; CFI = .95; RMSEA = .06; $p/$close = .17; SRMR = .07 indicated a good fit of the data to the model. As the $\chi^2$ statistic is highly sensitive to sample size and the other goodness of fit indices were acceptable (Hair Jr., Black, Babin, & Anderson, 2010), the data were deemed to provide a good fit to the model.

The modification indices revealed no additions that were theoretically relevant or that would result in a significant improvement in the fit of the data to the model. Those paths in the model that were not significant at $p < .05$ (e.g., Decision-Making Stress $\rightarrow$ Decisional Coping Strategies) were removed for parsimony as they failed to contribute to the understanding of decision-making stress and satisfaction (Figure 7.3; Table 7.7).

The variables in the final model explained 61% of the variance in decision satisfaction, 81% of the variance in decision-making stress, 52% of the variance in decisional coping strategies, 36% of the variance in metacognitive acceptance, and 4% of the variance in metacognitive awareness (Figure 7.3).
Figure 7.3. Final model within an occupation/study context showing standardised, predictive pathways (β) and squared-multiple correlations (%). Dashed pathways were removed from the final model, as they are not significant at $p < .05$.

* $p < .05$; ** $p < .01$; *** $p < .001$; DAS = Decision Appraisals Scale; MAS = Metacognitive Awareness Scale; AAQII = Acceptance and Action Questionnaire, Version II.
### Table 7.7

*Goodness of Fit Statistics for the Final Model within an Occupation/Study Context*

<table>
<thead>
<tr>
<th></th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>$\chi^2$/df</th>
<th>GFI</th>
<th>TLI</th>
<th>CFI</th>
<th>RMSEA</th>
<th>$p$/close</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesised Model</td>
<td>79.17</td>
<td>46</td>
<td>.002</td>
<td>1.72</td>
<td>.93</td>
<td>.92</td>
<td>.95</td>
<td>.06</td>
<td>.17</td>
<td>.07</td>
</tr>
<tr>
<td>Paths Removed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decision-Making Stress → Decisional Coping Strategies</td>
<td>79.41</td>
<td>47</td>
<td>.002</td>
<td>1.69</td>
<td>.93</td>
<td>.93</td>
<td>.95</td>
<td>.06</td>
<td>.20</td>
<td>.07</td>
</tr>
<tr>
<td>Decisional Coping Strategies → Decision-Making Stress</td>
<td>79.96</td>
<td>48</td>
<td>.003</td>
<td>1.67</td>
<td>.93</td>
<td>.93</td>
<td>.95</td>
<td>.06</td>
<td>.22</td>
<td>.07</td>
</tr>
<tr>
<td>Decisional Coping Strategies → Decision Satisfaction</td>
<td>80.80</td>
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<td>.003</td>
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<td>.93</td>
<td>.93</td>
<td>.95</td>
<td>.06</td>
<td>.23</td>
<td>.07</td>
</tr>
</tbody>
</table>

*Note.* GFI = Goodness-of-Fit Index; TLI = Tucker-Lewis Index; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; $p$/close = probability of close fit; SRMR = Standardised Root Mean Square Residual.
**Direct Effects.** Decision appraisals had a direct, positive effect on the use of decisional coping strategies ($\beta = .32$) and a direct, negative effect on decision-making stress ($\beta = -.85$). There were direct, negative effects of decision-making stress on decision satisfaction ($\beta = -.78$) and on metacognitive acceptance ($\beta = -.67$). The use of decisional coping strategies exerted no significant, direct effect on decision satisfaction, but coping did have a direct, positive effect on metacognitive awareness ($\beta = .32$), which in turn, had a direct, negative effect on decision-making stress ($\beta = -.38$). Metacognitive acceptance had a direct, negative effect on decisional coping strategies ($\beta = -.89$). There were no direct or reciprocal effects between decision-making stress and decision coping strategies. There were multiple indirect effects in the model, most of which had multiple pathways; therefore discussion will be confined to the total effects (Direct + Indirect effects) presented next.

**Total Effects.** Decision appraisals exerted a total, negative effect of $\beta = -.85$ on decision-making stress and a total, positive effect of $\beta = .65$ on decision satisfaction through decision-making stress. Decision-making stress exerted a total, negative effect of $\beta = -.78$ on decision satisfaction through metacognitive acceptance, the use of decisional coping strategies, and metacognitive awareness. Decision-making stress also exerted a total, positive effect of $\beta = .55$ on the use of decisional coping strategies through metacognitive acceptance. Metacognitive acceptance had a total, negative effect of $\beta = -.27$ on metacognitive awareness through the use of decisional coping strategies. Lastly, metacognitive awareness exerted total, positive effects of $\beta = .24$ on metacognitive acceptance and $\beta = .28$ on decision satisfaction through decision-making stress (Table 7.8).
Table 7.8

*Standardised Total Effects (β) within the Final Model in an Occupation/Study Context*

<table>
<thead>
<tr>
<th>Metacognitive Awareness</th>
<th>Metacognitive Acceptance</th>
<th>Decision-Making Stress</th>
<th>Decision Coping Strategies</th>
<th>Decision Appraisals</th>
<th>Uninformed</th>
<th>Positive Affect</th>
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</thead>
<tbody>
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<td>.18</td>
<td>.30</td>
<td>-.06</td>
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</tr>
<tr>
<td>Metacognitive Acceptance</td>
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<td>.08</td>
<td>.55</td>
<td></td>
</tr>
<tr>
<td>Decision-Making Stress</td>
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<td>-.85</td>
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</tr>
<tr>
<td>Decisional Coping Strategies</td>
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</tr>
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<td>-.78</td>
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<td>.06</td>
<td>.55</td>
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</tr>
<tr>
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<td>-.07</td>
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<td>.50</td>
<td>-.09</td>
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<tr>
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<td>-.47</td>
<td>.31</td>
<td>.53</td>
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<td></td>
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<td>.83</td>
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</tbody>
</table>

*Note. AAQ-II = Acceptance and Action Questionnaire, Version II; MAS = Metacognitive Awareness Scale; DAS = Decision Appraisals Scale.*
Discussion

The aim in Phase One of this repeated measures study was to test the proposed Cognitive-Affective Model of Decision-Making Stress and Satisfaction in relation to a decision participants had made about their occupation or study within the previous six months. Two new scales: (1) the Decision Appraisals Scale (DAS) and (2) the Metacognitive Awareness Scale (MAS) were developed for this study as no extant scales assessing these constructs were identified in the literature. The construct validity and internal reliability of these scales is discussed first, prior to the model testing.

The Decision Appraisals Scale

The results of the Principal Components Analysis (PCA) support the unifactorial structure of the Decision Appraisals Scale (DAS) in an occupation/study context. The items explained 54.07% of the variance and demonstrated adequate internal reliability, Cronbach’s $\alpha = .69$. The marker item: “I was able to cope with making the decision” can be seen to parallel Lazarus and Folkman’s (1984) concept of secondary appraisal in that the person appraised that they had the resources or the ability to deal with the demand, in this case, the decision to be made. The other items in the scale also support a link to secondary appraisals, such as “I had the energy to make the decision”. The DAS addresses the need for a scale to assess decision appraisals in the proposed model. The construct validity and internal reliability of the second scale developed for this study, the Metacognitive Awareness Scale, was then tested in the same manner.

The Metacognitive Awareness Scale

The results of the PCA support the unifactorial structure of the Metacognitive Awareness Scale (MAS). The items explained 57.32% of the variance and exhibited
strong internal reliability, Cronbach’s $\alpha = .81$. The marker variable, “I was aware of my thoughts and how I was thinking at that time”, reflects the concept of metacognitive awareness in that the person was aware of their thoughts and thinking processes at a specific point in time, in this instance, when making a decision. These results suggest that the MAS is an appropriate measure of people’s metacognitive awareness when making decisions in an occupation/study context.

**Correlation Analyses**

Pearson’s Product Moment Correlations revealed that the majority of the measures were significantly inter-correlated as hypothesised. Participants’ scores on their appraisal of specific resources available to them to cope with making their decision were correlated negatively with the hypothesised components of decision-making stress\(^2\) and negative affect but positively with positive affect. While not causal, this finding can be interpreted to suggest that participants with a positive appraisal of their situation, in this instance the need to make a decision, experienced less decision-making stress and more positive affect. That is, they felt less uncertain, more informed and supported and their values were clear to them at that time. These correlation results support Lazarus and Folkman’s (1984) argument that there is a relationship between people’s experience of stress and their appraisal of having sufficient resources available to cope with a stressor, in this instance the decision to be made.

Participants’ decision appraisal scores were also negatively correlated with levels of avoidance as a means of coping with the decision which can be taken as an indication that participants were being proactive (Greenglass & Fiksenbaum, 2009).

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\(^2\) The hypothesised components of decision-making stress were: (1) feeling uninformed about the available alternative, (2) unclear about the most valued option, (3) feeling unsupported by others, (4) feeling uncertain about what to choose, (5) positive affect, and (6) negative affect.
As anticipated most variables in the model were correlated with decision satisfaction in the hypothesised directions including metacognitive awareness and acceptance. The only variable that failed to demonstrate a substantial correlation with any variable, other than with one of the proposed components of decision-making stress, namely feeling unsupported, was the coping variable use of social resources. This finding is contrary to most research that suggests that social support, typically a part of people’s resources, is either a buffer or a direct protector against stress (Billings & Moos, 1981, 1984; Carver, 2011; Chao, 2011; Davis & Brekke, 2014; Greenglass & Fiksenbaum, 2009; Moore, 2003; Romero, Riggs, & Ruggero, 2015). As a consequence of this null finding with respect to appraisal and use of social resources and the latter’s possible confound with unsupported as a component of decision-making stress, the use of social resources variable was excluded from the hypothesised measurement model and subsequent model testing.

**Measurement Model**

The data were tested for their goodness of fit against the hypothesised measurement model and following modifications that included adding a path from positive affect to changing the situation and a path from uninformed to values unclear, the model was acceptable. Negative affect was removed at this stage as it failed to contribute to its latent variable, decision-making stress.

The finding that negative affect did not contribute to understanding decision-making stress is not consistent with Janis and Mann’s (1977) Conflict Theory. This result is also unexpected considering the focus in the stress research on negative affect as a key indicator of the stress people experience (Bhui, Sokratis, Stansfeld, & White, 2012; Feldman, Cohen, Hamrick, & Lepore, 2004; Nixon, Mazzola, Bauer,
The significant contribution of positive affect as a negative contributor to the latent variable decision-making stress supports Folkman and Moskowitz’s (2000) and Greenglass and Fiksenbaum’s (2009) argument that positive affect should be included in any attempt to understand people’s stress. Given that the assessment of positive and negative affect in the current study is based on D. Watson et al.’s (1988) conceptualisation of positive and negative affect as two, unipolar constructs, it appears to be the absence of positive affect and not the presence of negative affect that better indicates participants’ decision-making stress. Clearly, a focus on promoting positive affect, more so than alleviating negative affect, is important to assist people in reducing their decision-making stress.

The three decisional coping strategies: (1) avoid the decision, (2) change the situation, and (3) change expectations each positively contributed to participants’ decisional coping. This result is at first counter intuitive and not in accord with the broader coping literature (Folkman & Moskowitz, 2000; Lazarus & Folkman, 1984; Pearlin et al., 1981), wherein avoidance, an emotion-focused strategy, might be regarded as negatively contributing to coping with demands while attempts to change the situation and to change one’s own expectations, more proactive strategies, might be regarded as positive contributors to coping. Lazarus and Folkman (1984) have found however, that people can use both emotion- and problem-focused strategies simultaneously and this would explain the positive loadings. Alternatively, it could be inferred that the use of strategies to change the situation and change expectations, might also be forms of avoiding the decision or the perceived alternatives. That is, the participants may have avoided making their
decision until they changed aspects of the situation to get what they wanted or changed their expectations until the decision appeared easier to make. If either were the case, it would explain why all three of these factors contributed positively to decisional coping.

**Model Testing**

The revised Cognitive-Affective Model of Decision-Making Stress and Satisfaction provided a good fit of the data to the model in respect to a decision related to participants’ occupation or study. The fit of the data to the modified model remained stable even when the non-significant paths (decision-making stress → decisional coping strategies, decisional coping strategies → decision-making stress, and decisional coping strategies → decision satisfaction) were removed for parsimony. Of the five latent variables in the final model, four (decision satisfaction, decision-making stress, decisional coping strategies, and metacognitive acceptance) had over 35% of their variance explained by the variables in the model. It can be inferred from these generally high figures that the model is appropriately specified (Hair Jr. et al., 2010) and reliable conclusions about the effects in the model can be made.

**Impact on Decision Satisfaction.** The variables in the final model accounted for a substantial 61% of the variance in decision satisfaction, the primary outcome variable in the model. Decision satisfaction, assessed with O’Connor’s (1995) four-item Effective Decision subscale, included items not only about how satisfied the participants were with the decision they had made (e.g., I am satisfied with my decision), but also whether they thought that they had made an informed choice; that their decision reflects what is important to them and whether they are unlikely to change their decision (e.g., I expect to stick with my decision). These items all
indicate that the participant had made an informed choice, one that was important to 
them, and one with which they satisfied. This last point is especially important in 
terms of the antithesis of decision satisfaction, what Janis and Mann (1977) termed 
post-decision conflict.

In terms of which factors exerted the most influence on participants’ decision 
satisfaction, clearly their level of decision appraisal was a strong, albeit indirect, 
positive influence, while decisional stress was a strong negative predictor. Such 
findings suggest that it is the positive nature of people’s appraisal or thinking about 
issues that can lead to a satisfying decision while stress ameliorates this satisfaction. 
As expected, positive appraisals, such as having enough time or energy to make the 
decision, exerted a negative influence on decision-making stress. These results 
support Keng and Liao (2009), Vandemheen et al. (2009) and Kokufu (2012) who all 
found people’s decision-making stress has a negative impact on their decision 
satisfaction.

Metacognitive awareness (e.g., I was aware of my thoughts and thinking at 
the time) was also a significant albeit less substantial and indirect influence on 
decision satisfaction. This last finding suggests that a person’s ability to be aware 
their own thought processes could lead to a positive result, in this case, a decision 
with which they are satisfied.

**The Role of Decision Appraisals.** In terms of how positively participants 
appraised their decisions, that is, their evaluations of having enough time, energy, 
the ability to find the best outcome and of being able to cope with the decision-
making process, substantially reduced their levels of decision-making stress (.85). 
Positive secondary appraisals also increased directly, as well as indirectly through 
decision-making stress and metacognitive acceptance, participants coping efforts.
This result provides support for Janis and Mann’s (1977) Conflict Theory and Lazarus and Folkman’s (1984) Transactional Model of Stress and Coping where they argued that people’s appraisal of a demand or stressor has implications for how they cope with the demand and also implications for how much stress is experienced.

It is important to comment that while participants’ positive decision appraisals lead to both an increase in their use of avoidance (e.g., I tried to avoid thinking about the decision) an emotion-focused strategy as well as more proactive strategies, that is changing the situation or one’s expectations, this may not necessarily be either theoretically or practically incongruent as mentioned earlier (Lazarus & Folkman, 1984, 1987; Richter et al., 2013; Romero et al., 2015; Somerfield & McCrae, 2000; Stanton & Snider, 1993). Alternatively, it may be that if participants appraised they had both the time and energy required to make a decision, they could turn their attention away from the decision in the short-term. Such a form of avoidance could be considered a positive response to positive appraisals, although future research would be needed to explore this proposition further.

It is clear from the model that decision appraisals have an important role in reducing the intensity of people’s decision-making stress, increasing their ability to cope with that stress, and ultimately to make the most satisfying decision possible. Certainly health or other professionals might strengthen their own and other people’s ability to make satisfying decisions especially when under stress. This might require a focus on how people appraise their decisions in terms of the resources available to them to make a decision or to cope with the process of decision-making, as well as fostering capacity to be metacognitively aware of their thoughts and thinking.
processes. Further research might further explore the role of decision appraisals on people’s stress, coping, metacognitive abilities and decision satisfaction.

**Decision-Making Stress, Coping, and Metacognitions.** The hypothesis that direct, reciprocal effects exist between participants’ decision-making stress and the use of decisional coping strategies was not supported. This lack of direct, reciprocal effects is inconsistent with Janis and Mann’s (1977) and Lazarus and Folkman’s (1984) argument that the stress people experience is a direct predictor of their use of coping strategies that are subsequently aimed at reducing their stress levels. In fact, the direct, reciprocal effects between stress and coping are a central dynamic in the cognitive models of stress and coping (Folkman & Moskowitz, 2000; Lazarus & Folkman, 1984; Pearlin & Schooler, 1978) generally. It is clear in the model however, that decision-making stress and the use of decisional coping strategies do have an overall impact on each other (total effects of .55 and -.11, respectively) through metacognitive awareness and acceptance.

Participants’ metacognitive acceptance of their thoughts surrounding the decision being made acted as an intermediary between their levels of stress and their subsequent use of decisional coping strategies. With higher levels of decision-making stress, there was a decrease in levels of metacognitive acceptance (e.g., My painful experiences and memories made in difficult to make a decision that I would value), which in turn directly contributed to a substantial reduction in participants’ use of decisional coping strategies (-.89). These findings support Harris (2009b) and Hayes et al. (2006) who both argued that the discomfort of stress can have a negative impact on a person’s ability to accept their thoughts and thinking and thus increase their use of avoidance strategies as way of managing the stress felt. It might be that in circumstances where stress levels are high, people’s ability to engage in higher-
order cognitive process such as metacognitive acceptance generally is reduced. Indeed, this is an effect commonly seen in people suffering from anxiety disorders (Bhui et al., 2012; Campagna & Curtis, 2007; Craigie, Rees, & Marsh, 2008; Mahaffey et al., 2012; Pearson et al., 2014; Sharp, 2012; White et al., 2013).

In addition, metacognitive awareness (“I was aware of my thoughts and how I was thinking at that time”) also acted as an intermediary factor, in this case between participants’ use of decisional coping strategies and their level of decision-making stress. That is, as the participants utilised more decisional coping strategies, their metacognitive awareness also increased, which in turn reduced their level of decision-making stress. It can be inferred therefore, that people’s use of decisional coping strategies might contribute to an overall reduction in their decision-making stress through increasing their metacognitive awareness. Indeed, such an enhancement is consistent with Hayes et al.’s (2006) ACT framework and the ACT-focused research in general (Masuda et al., 2010; McCracken et al., 2014; Ruiz, 2012). It might be that an ACT framework can be utilised by clinicians to cultivate people’s metacognitive awareness in order to reduce stress and at the same time, their metacognitive acceptance to foster coping and thus enhance their ability to cope with the stress involved in decision-making and more generally.

Overall, the results of the model testing provide initial support for the Cognitive-Affective Model of Decision-Making Stress and Satisfaction in relation to a decision concerning people’s occupation or study. When appraising enough time and energy, the ability to find the best outcome, and a general ability to cope with making the decision, people may experience reduced decision-making stress. In addition, they may also increase their use of decisional coping strategies. While decision-making stress might positively contribute to peoples’ use of decisional
coping strategies, this effect would be indirect through their metacognitive acceptance. The corresponding effect of using decisional coping strategies to reduce their decision-making stress would also be small and indirect through people’s metacognitive awareness. The resultant level of decision-making stress experienced might then have the strongest, direct, negative effect on whether people make a decision with they are satisfied or not.

**Theoretical Implications**

The results in this study have furthered our theoretical understanding of decision satisfaction and decision-making. The integration of two extant theories: Conflict Theory (Balneaves & Long, 1999; Janis & Mann, 1977; Lewin, 1943) and a cognitive model of stress and coping (Lazarus & Folkman, 1984; Pearlin & Schooler, 1978; Lazarus & Folkman, 1984), together with the incorporation of recent developments related to metacognitive awareness and acceptance (Hayes et al., 2013; Hayes et al., 2011) and positive affect (Folkman, 2008; Folkman & Moskowitz, 2000) have provided a contemporary approach to the research on decision-making.

Firstly, the results highlight the important contribution that decision-making stress has on whether people are able to make satisfying decisions. Of all the major theoretical developments in decision-making research, it is the conflict approach (Balneaves & Long, 1999; Janis & Mann, 1977; Lewin, 1943) that includes a central role for the stress people experience when making decisions. In the alternative theories: normative (W. Edwards, 1953; Kahneman & Tversky, 1979; Ramsey, 1926), heuristic (Gigerenzer & Todd, 1999; Kahneman & Tversky, 1982), and process approaches (Evans, 2011; V. A. Thompson, 2009) consideration of the impact of decision making-stress is minimal. Given the important role of decision-
making stress identified, further confirmation of the contribution of this factor in other decision-making contexts is warranted.

Secondly, when participants appraised that they had the resources required to make their decision, they experienced less stress and utilised more coping strategies. This link between people’s appraisals, stress, and coping is consistent with the cognitive models of stress and coping (Hobfoll, 1989; Lazarus & Folkman, 1984; Pearlin & Schooler, 1978) and the conflict approach to decision-making (Balneaves & Long, 1999; Janis & Mann, 1977; Lewin, 1943). Therefore, the current finding that people’s perceptions or evaluations of the resources available to them to make a decision in terms of whether they have enough time, energy, the ability to find the best solution, and of their general ability to cope will determine how stressed they feel and what strategies they employ to reduce the stress.

The focus on people’s appraisals, stress, and coping is in contrast to the normative, heuristic, and process approaches to decision-making. The focus in the normative approach is predicting what decision will maximise people’s actual or expected utilities or prospects (W. Edwards, 1953; Kahneman & Tversky, 1979; Ramsey, 1926). While the heuristic approach (Gigerenzer & Todd, 1999; Kahneman & Tversky, 1982) involves people’s cognitions or mental process, the focus is on the strategies people utilise to make the best or more satisfying decision possible, instead of the stress and coping experienced. Furthermore, the process approach (Evans, 2011; V. A. Thompson, 2009) which reflects an amalgamation of the normative and heuristic approaches, thus remaining focused on the processes involved when people make decisions. Minimal consideration is given to the appraisals, stress, and coping involved in making a decision which were emphasised in the current study.
Lastly, the contribution of metacognitive awareness and acceptance on people’s stress and coping adds an additional metacognitive layer to the cognitive-affective factors involved in people’s decision-making. This metacognitive layer exists in other models of decision-making, for example in his Hybrid Model of Decision Making, Evans (2009) included “Type 3” metacognitive processes. The role of metacognitive factors’, in this instance metacognitive awareness and acceptance, contribution to people’s decision-making stress, coping, and satisfaction has been highlighted in the current study. Further examination of this contribution is warranted to confirm the results. For instance, whether the Cognitive-Affective Model of Decision-Making Stress and Satisfaction can be replicated in other contexts, notably decisions related to people’s family or relationship, and their health will be the focus in Phases Two and Three of this study.

**Summary**

The proposed Cognitive-Affective Model of Decision-Making Stress and Satisfaction was tested in relation to a decision people had made recently concerning their occupation or study in a sample of 182 adults. The Decision Appraisals Scale (DAS) designed to assess Janis and Mann’s (1977) decision appraisals, and the Metacognitive Awareness Scale (MAS) designed to assess participants’ awareness of their thoughts while making a decision were developed for use across the three phases of this study. The DAS and MAS demonstrated good construct validity and internal reliability and were utilised in the model testing. The model testing provided overall support for the model in an occupation/study context with only a few modifications. Sixty-one per cent of participants’ decision satisfaction and 81% of their decision-making stress were predicted by the variables in the model. The results confirm the role of people’s appraisals, stress, coping, and metacognitive awareness
and acceptance on their decision satisfaction. Theoretical implications of these findings include the addition of a metacognitive layer to the cognitive-affective factors involved in people’s decision-making as well as the importance of including positive affect as a separate construct in addition to negative affect. Whether the model is replicable across multiple types of decisions such as family or relationships, and health will be the focus in Phases Two and Three.
CHAPTER EIGHT

Phase Two

Aims and Hypotheses

The aim in Phase Two of this longitudinal study was to replicate the modified Cognitive-Affective Model of Decision-Making Stress and Satisfaction determined in Phase One of the study (Figure 8.1) with respect to a decision people had made within the past six months regarding their family or their relationship. In addition, the construct validity and internal reliability of the Decision Appraisals Scale (DAS) and the Metacognitive Awareness Scale (MAS) will be subjected to confirmatory analyses.

Method

Design

The second phase in this repeated-measures design was to replicate the Cognitive-Affective Model of Decision-Making Stress and Satisfaction presented in Phase One in relation to a decision participants had made concerning their family or their relationship over the previous six months.

Participants

Eighty-four of the 182 participants from Phase One (11 males, $M_{\text{age}} = 36.27$ years, $SD = 6.39$; 73 females, $M_{\text{age}} = 39.90$ years, $SD = 12.53$) participated in Phase Two. An independent samples $t$-test indicated no significant difference in participants’ age by gender, $t_{82} = .94$, $p = .35$. The current sample represents a 46% response rate of participants from Phase One.

Procedure

Ethical approval for the conduct of this study was obtained from the Charles Darwin University Human Research Ethics Committee (CDU-HREC; Appendix
A.1). A reminder to participate in the current phase of the study (Appendix C.1) was emailed to those participants who provided their email address at the end of Phase One. The email thanked participants for their participation in the previous study and for consenting to participate in the current study on a decision related to their family or relationship. The email also contained a web link to the online survey http://cduhes.asia.qualtrics.com/SE/?SID=SV_2h660pLOJv2RVCB.

The web link provided a Plain Language Statement (Appendix C.2) similar to that provided for Phase One and an advice to participants that they could withdraw from the study at any time by simply closing their Internet browser. They were also advised that completion and submission of the online survey (Appendix C.3) would be deemed to be their informed consent to participate in the current study. No incentives were offered for participation in the study.

At the completion of the online survey participants were asked if they were willing to complete the online survey a third and final time one month later while reflecting on a different decision. Those participants who consented to completing the third and final online survey were then asked to provide the same six-letter code as used in P1. The participants were then directed through the same procedure as in Phase One to provide their email details in a separate file. At no time was it possible to link the email addresses to the respective participant’s original responses. If participants chose not to provide their consent, they were simply directed to submit their responses from the current study and thanked for their time.

Materials

All participants were required to provide their six-letter code, as well as demographic information on their age, gender, marital status and current or most
recent occupation/study. These factors were used to match participants’ current data with their scores at P1.

Participants were also required to complete the same scales that contributed to the model in Phase One (Figure 7.3). The scales were answered in terms of a decision related to their family or relationship made within the previous six months.

- The Decision Appraisals Scale (described in Phase One)
- The Metacognitive Awareness Scale (described in Phase One)
- The Acceptance and Action Questionnaire, Version II (Bond et al., 2011)
- The Decisional Conflict Scale (O’Connor, 1995)
- The Positive Affect subscale of the International Positive and Negative Affect Scale, Short Form (E. R. Thompson, 2007)
- The Avoidance, Change the Situation, and Change Expectations subscales of the Cybernetic Coping Scale-15 (Guppy et al., 2004)

A full description of these scales is provided in Chapter Seven.

**Results**

The data were analysed using the Statistical Package for Social Sciences (SPSS; Version 22) and the structural equation modelling software, AMOS (Version 7). The statistical analyses were conducted in two phases: (1) analysis of the demographics and decision context data, (2) confirmatory factor analyses and internal reliability analyses of the Decision Appraisals Scale (DAS) and the Metacognitive Awareness Scale (MAS), (3) structural equation modelling to test the Cognitive-Affective Model of Decision-Making Stress and Satisfaction in a family/relationship decision context, and (4) invariance testing of the model across the occupation/study (Phase 1) and family/relationship (Phase 2) contexts.
Prior to conducting the relevant statistical tests, the data from participants who responded at Phase 2 were compared against the Phase 1 data set to determine if there were any systematic differences in respondents.

A Pearson’s Chi-square ($\chi^2$) test indicated there was no association between the gender of the participant pool at P1 and the gender of those who also participated at P2, $\chi^2 \approx .26$, $p = .61$ (Table 8.1).

Table 8.1

Participants’ Gender by Study Phase: Phase 1 (P1) and Phase 2 (P2)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Study Phase</th>
<th>$\chi^2_{1}$</th>
<th>Cramer’s V</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P1</td>
<td>P2</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>147 (84.5)</td>
<td>73 (86.9)</td>
<td>.26 $^b$</td>
</tr>
<tr>
<td>Male</td>
<td>27 (15.5)</td>
<td>11 (13.1)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>174 $^a$ (100.0)</td>
<td>84 (100.0)</td>
<td></td>
</tr>
</tbody>
</table>

$^a$ Eight participants at P1 did not indicate their gender.

$^b$ $p = .66$

An Independent samples $t$-test revealed no significant gender difference on age between P1 and P2 participants (Table 8.2).

Table 8.2

Participants’ Age by Gender in Phase 1 (P1) and Phase 2 (P2)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age (years)</th>
<th>P1</th>
<th>P2</th>
<th>$t$</th>
<th>$df$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n = 174$^a$)</td>
<td>(n = 84)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>41.33 (12.25)</td>
<td>39.90 (12.53)</td>
<td>.81</td>
<td>218</td>
<td>.42</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>36.04 (9.92)</td>
<td>36.27 (6.39)</td>
<td>.07</td>
<td>36</td>
<td>.94</td>
<td></td>
</tr>
</tbody>
</table>

$^a$ Eight participants in Phase One did not indicate their gender
Furthermore, testing was conducted to determine if there were any systematic effects between the participants who responded in Phase Two \((n = 84)\) and those who did not \((n = 98)\) on their Phase One data.

A \(\chi^2\) test revealed no significant association by gender by P1 and P2 participation \((\chi^2 = .35, p = .55)\); an independent samples \(t\)-test revealed no significant age difference between the participants who responded at P2 and those who did not \((t_{180} = 1.69, p = .09)\), and a one-way Multivariate Analysis of Variance revealed no significant differences on the study variables at P1 between the participants who responded at P2 and those who did not \((\text{Pillai’s Trace } F_{12,169}^{12} = 1.43, p = .16, \text{ partial } \eta^2 = .09)\) (Table 8.3).

Table 8.3

Descriptive Statistics for each Variable in Phase 1 (P1) and Phase 2 (P2)

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean (SD)</th>
<th>P1</th>
<th>P2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>a</td>
<td>b</td>
</tr>
<tr>
<td>DAS</td>
<td>14.93 (2.54)</td>
<td>15.26 (2.69)</td>
<td></td>
</tr>
<tr>
<td>MAS</td>
<td>18.74 (3.45)</td>
<td>18.59 (3.45)</td>
<td></td>
</tr>
<tr>
<td>AAQII</td>
<td>20.35 (4.11)</td>
<td>19.01 (4.45)</td>
<td></td>
</tr>
<tr>
<td>DCS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uninformed</td>
<td>6.23 (2.28)</td>
<td>6.00 (2.01)</td>
<td></td>
</tr>
<tr>
<td>Values Unclear</td>
<td>6.63 (2.69)</td>
<td>6.16 (2.41)</td>
<td></td>
</tr>
<tr>
<td>Unsupported</td>
<td>7.78 (2.75)</td>
<td>8.53 (2.64)</td>
<td></td>
</tr>
<tr>
<td>Uncertainty</td>
<td>8.40 (2.79)</td>
<td>8.54 (2.71)</td>
<td></td>
</tr>
<tr>
<td>Decision Satisfaction</td>
<td>16.47 (2.99)</td>
<td>16.27 (2.90)</td>
<td></td>
</tr>
<tr>
<td>I-PANAS-SF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Affect</td>
<td>17.51 (3.67)</td>
<td>16.36 (3.96)</td>
<td></td>
</tr>
<tr>
<td>CCS-15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change the Situation</td>
<td>9.11 (3.01)</td>
<td>7.78 (3.10)</td>
<td></td>
</tr>
<tr>
<td>Change Expectations</td>
<td>8.82 (2.40)</td>
<td>8.76 (2.87)</td>
<td></td>
</tr>
<tr>
<td>Avoidance</td>
<td>6.81 (2.75)</td>
<td>6.70 (3.00)</td>
<td></td>
</tr>
</tbody>
</table>

Note. DAS = Decision Appraisals Scale; MAS = Metacognitive Awareness Scale; DCS = Decisional Conflict Scale; I-PANAS-SF = International Positive and Negative Affect Scales, Short Form; CCS-15 = Cybernetic Coping Scale, 15-item version. \(^a n = 182; \ ^b n = 84\)
Considered together, these results suggest there were no systematic effects present on participants’ demographic factors or on the study variables assessed at Phase 1 between those participants who participated in Phase 2 of the study and those who did not.

**Current Demographics and Decision Context**

Of the female participants in P2, 57.5% reported that they were married or living together with a partner, while 54.5% of the male participants reported that they were single. A Pearson’s Chi-square ($\chi^2$) test indicated no association between participants’ gender and marital status (Table 8.4).

Table 8.4

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Gender</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>Male</td>
<td>$\chi^2$</td>
<td>Cramer’s V</td>
</tr>
<tr>
<td>Single</td>
<td>21 (28.8)</td>
<td>6 (54.5)</td>
<td>3.73 $^a$</td>
<td>.21</td>
</tr>
<tr>
<td>Married/Living Together</td>
<td>42 (57.5)</td>
<td>5 (45.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divorced</td>
<td>10 (13.7)</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Widowed</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>73 (100.0)</td>
<td>11 (100.0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$^a p = .15$

In addition, 57.5% of the female participants and 54.5% of the male participants reflected on a decision related to their family, as opposed to their relationship with a partner or significant other. A Pearson’s $\chi^2$ test indicated no association between participants’ gender and the context of their decision (Table 8.5).
Table 8.5

*Decision Context by Participants’ Gender*

<table>
<thead>
<tr>
<th>Decision Context</th>
<th>Gender</th>
<th>(\chi^2)</th>
<th>Cramer’s V</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>Male</td>
<td></td>
</tr>
<tr>
<td>Family</td>
<td>42 (57.5)</td>
<td>6 (54.5)</td>
<td></td>
</tr>
<tr>
<td>Relationships</td>
<td>31 (42.5)</td>
<td>5 (45.5)</td>
<td>.03 (^a)</td>
</tr>
<tr>
<td>Total</td>
<td>73 (100.0)</td>
<td>11 (100.0)</td>
<td></td>
</tr>
</tbody>
</table>

**Confirmatory Factor Analyses and Internal Reliability Analyses**

Confirmatory Factor Analyses (CFAs) using a Maximum Likelihood Estimation method were conducted to confirm the factor structures of the DAS and the MAS in the current data.

Inspection of histograms, box plots, skewness, kurtosis, and Shapiro-Wilk statistics for the DAS revealed approximate item normality. The independent Chi-square (\(\chi^2_{\text{indep}}\)) confirmed there were significant relationships among the variables in the model, \(\chi^2_{\text{indep}} = 48.23, p < .001\). The \(\chi^2\) and other fit indices all supported the fit of the data to the model, \(\chi^2 = 3.80, p = .15\); Relative \(\chi^2 (\chi^2/df) = 1.90\); Goodness of Fit Index (GFI) = .98; Tucker-Lewis Index (TLI) = .87; Comparative Fit Index (CFI) = .96; Root Mean Square Error of Approximation (RMSEA) = .10; Probability of Close Fit (\(p/\text{close}\)) = .21; Standardised Root Mean Square Residual (SRMR) = .05 (Figure 8.1).
Internal reliability of the DAS was calculated using Cronbach’s $\alpha$, which was marginal ($\alpha = .65$). Although removal of the fourth item: “I thought that I had enough time to make the decision” would have improved alpha by .05 to $\alpha = .70$, it was not removed as it would have been at too great a cost to the theory behind the scale, that is as a measure of the decision appraisals central to Janis and Mann’s Conflict Theory.

Inspection of histograms, box plots, skewness, kurtosis, and Shapiro-Wilk statistics for the MAS also revealed approximate item normality. The $\chi^2_{\text{indep}}$ confirmed there were significant relationships among the variables in the model, $\chi^2_{\text{indep} \ 10} = 163.57, p < .001$. The $\chi^2$ and other fit indices all supported the fit of the data to the model, $\chi^2_{\text{s}} = 5.74, p = .33; \chi^2/df = 1.15; \text{GFI} = .97; \text{TLI} = .99; \text{CFI} = .99; \text{RMSEA} = .04; p/close = .45; \text{SRMR} = .04$ (Figure 8.2).
Confirmatory Factor Analysis of the Metacognitive Awareness Scale (MAS) within a family/relationships context, showing standardised factor loadings ($\beta$).

$*** p < .001$

Internal reliability of the MAS was calculated using Cronbach’s $\alpha$, which was strong (Cronbach’s $\alpha = .80$). These analyses determined that the DAS and the MAS were suitable for inclusion in the model testing.

Model Testing

The modified Cognitive-Affective Model of Decision-Making Stress and Satisfaction determined in Phase One was tested in relation to participants’ decision concerning their family or their relationship using the structural equation modelling software, AMOS (Version 7).

Goodness of Fit Indices and Explained Variances. In order to identify the model, the error variances of MAS, AAQII, DAS, and the manifest Decision Satisfaction variable were constrained according to Bollen’s (1989) recommendations for single-indicator latent variables.

The $\chi^2_{indep}$ indicated there were significant relationships between the variables in the model, $\chi^2_{indep} = 805.45$, $p < .001$. The $\chi^2$ and other fit indices all

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$^3$ Bollen (1989) recommended such error variances be constrained to: $(1 - \alpha)s^2$ where $\alpha$ = Cronbach’s alpha coefficient of the relevant manifest variable, and $s^2$ = variance of the relevant manifest variable.
supported the fit of the data to the model in a family/relationships context, $\chi^2_{60} = 93.21$, $p = .004$, $\chi^2/df = 1.55$; GFI = .93; TLI = .93; CFI = .95; RMSEA = .05; $p$/close = .63; SRMR = .05 (Figure 8.4).

The variables in the model explained 62% of the variance in decision satisfaction, 75% of the variance in decision-making stress, 74% of the variance in decisional coping strategies, 17% of the variance in metacognitive acceptance, and 3% of the variance in metacognitive awareness. As expected, there are some variations in the explained variances between Phase Two and Phase One (Figure 8.3) but as is shown in the invariance testing later, these were not significant.

**Direct Effects.** Decision appraisals had a direct effect on participants’ use of decisional coping strategies ($\beta = .52$) and a direct, negative effect on their decision-making stress ($\beta = -.81$). There was a direct, negative effect for decision-making stress on participants’ decision satisfaction ($\beta = -.79$) and metacognitive acceptance ($\beta = -.41$). The use of decisional coping strategies had no significant, direct effect on participants’ metacognitive awareness ($\beta = -.02$), although metacognitive awareness had a direct, negative effect on their decision-making stress ($\beta = -.28$).

Metacognitive acceptance had a direct, negative effect on participants’ use of decisional coping strategies ($\beta = -.53$). There are also some variations in the direct effects between Phase Two and Phase One but again, these are shown in the later report on the invariance testing not to be significant.
Figure 8.3. The model within a family/relationships context showing standardised, predictive pathways (β) and squared-multiple correlations (%). Dashed pathways, removed from the model in Phase One as they are not significant at \( p < .05 \), are included here for visual comparison only.

\* \( p < .05 \); \* \* \( p < .01 \); \* \* \* \( p < .001 \); \* d \( p < .10 \); DAS = Decision Appraisals Scale; MAS = Metacognitive Awareness Scale; AAQII = Acceptance and Action Questionnaire, Version II.
**Total Effects.** In terms of the total effects in the model, participants’ decision appraisals exerted a total, negative effect of $\beta = -0.82$ on their decision-making stress and a total, positive effect of $\beta = 0.65$ on their decision satisfaction. Decision-making stress exerted a total, negative effect of $\beta = -0.79$ on participants’ decision satisfaction, a total, negative effect of $\beta = -0.41$ on their metacognitive acceptance. There was also a total, positive effect of $\beta = 0.22$ for decision-making stress on participants’ use of decisional coping strategies through metacognitive acceptance. Metacognitive acceptance had a total, negative effect of $\beta = -0.53$ on participants’ use of decisional coping strategies, while metacognitive awareness had a total, positive affect of $\beta = 0.22$ on their decision satisfaction. There was a total, negative effect of $\beta = -0.28$ for metacognitive acceptance on participants’ decision-making stress. The standardised total effects ($\beta$) in the Cognitive-Affective Model of Decision-Making Stress and Satisfaction are presented in Table 8.6.
Table 8.6

*Standardised Total Effects ($\beta$) in the Cognitive-Affective Model of Decision-Making Stress and Satisfaction in the Family/Relationships Context*

<table>
<thead>
<tr>
<th></th>
<th>Metacognitive Awareness</th>
<th>Metacognitive Acceptance</th>
<th>Decision-Making Stress</th>
<th>Decisional Coping Strategies</th>
<th>Decision Appraisals</th>
<th>Uninformed</th>
<th>Positive Affect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metacognitive Awareness</td>
<td>.01</td>
<td>.01</td>
<td>-.01</td>
<td>-.02</td>
<td>.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metacognitive Acceptance</td>
<td>.11</td>
<td>.01</td>
<td>-.41</td>
<td>.01</td>
<td>.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decision-Making Stress</td>
<td>-.28</td>
<td>.01</td>
<td>.01</td>
<td>.01</td>
<td>-.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decisional Coping Strategies</td>
<td>-.06</td>
<td>-.53</td>
<td>.22</td>
<td>.01</td>
<td>-.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decision Satisfaction</td>
<td>.22</td>
<td>.01</td>
<td>-.79</td>
<td>-.01</td>
<td>.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uninformed</td>
<td>-.12</td>
<td>.01</td>
<td>.44</td>
<td>.01</td>
<td>-.36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unsupported</td>
<td>-.13</td>
<td>.01</td>
<td>.48</td>
<td>.01</td>
<td>-.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unclear Values</td>
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<td>.01</td>
<td>.63</td>
<td>.01</td>
<td>-.52</td>
<td>.26</td>
<td></td>
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<tr>
<td>Uncertain</td>
<td>-.20</td>
<td>.01</td>
<td>.71</td>
<td>.01</td>
<td>-.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Affect</td>
<td>.13</td>
<td>.01</td>
<td>-.47</td>
<td>.01</td>
<td>.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change Situation</td>
<td>.02</td>
<td>-.15</td>
<td>-.05</td>
<td>.28</td>
<td>-.10</td>
<td>.24</td>
<td></td>
</tr>
<tr>
<td>Change Expectations</td>
<td>-.03</td>
<td>-.23</td>
<td>.10</td>
<td>.44</td>
<td>-.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoid Decision</td>
<td>-.04</td>
<td>-.35</td>
<td>.14</td>
<td>.65</td>
<td>-.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decision Satisfaction</td>
<td>.20</td>
<td>.01</td>
<td>-.71</td>
<td>.01</td>
<td>.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAQ-II</td>
<td>.10</td>
<td>.89</td>
<td>-.37</td>
<td>.01</td>
<td>.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAS</td>
<td>.89</td>
<td>.01</td>
<td>.01</td>
<td>-.02</td>
<td>.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DAS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.81</td>
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</tr>
</tbody>
</table>

*Note. DAS = Decision Appraisals Scale; MAS = Metacognitive Awareness Scale; AAQ-II = Acceptance and Action Questionnaire, Version II.*
Invariance Testing

A series of hierarchically nested models with increasing parameter constraints were compared to assess the invariance of the Cognitive-Affective Model of Decision-Making Stress and Satisfaction in the family/relationships context (P2) and the occupation/study context (P1) following Bollen’s (1989) recommendations. A description of the parameter constraints made to each of the nested models is presented in Table 8.7. If the pooled data’s (P1 and P2) goodness of fit to the hierarchically nested models does not change significantly as they are systematically compared, then the Cognitive-Affective Model of Decision-Making Stress and Satisfaction is increasingly invariant across the two contexts (Milfont & Fischer, 2010).

Table 8.7

<table>
<thead>
<tr>
<th>Nested Model</th>
<th>Parameter Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1 - Configural Invariance</td>
<td>All parameters are allowed to vary freely across contexts a</td>
</tr>
<tr>
<td>Model 2 - Measurement Invariance</td>
<td>Measurement weights are constrained to equal across contexts.</td>
</tr>
<tr>
<td>Model 3 - Structural Invariance</td>
<td>Model 2 constraints with the measurement intercepts and structural weights also constrained to equal across contexts.</td>
</tr>
<tr>
<td>Model 4 - Structural Covariance Invariance</td>
<td>Model 3 constraints with the structural intercepts, means, and covariances also constrained to equal across contexts.</td>
</tr>
<tr>
<td>Model 5 - Structural residuals invariance</td>
<td>Model 4 constraints with the structural residuals also constrained to equal across contexts.</td>
</tr>
<tr>
<td>Model 6 - Measurement residuals invariance</td>
<td>Model 5 with measurement residuals also constrained to equal across contexts.</td>
</tr>
</tbody>
</table>

a Except for those measurement residuals already constrained following Bollen’s (1989) recommendation.
Initially, the goodness of fit of the data to the first of the nested models, Model 1 (Table 8.7), was assessed. In Model 1, all parameters were allowed to vary freely across the two contexts. The goodness of fit indices supported the fit of the data to Model 1 (Table 8.8), which indicates that the configuration or latent factor structures in the model are invariant across the occupation/study and family/relationships contexts.

The measurement weights for each of the manifest variables in the model were then constrained to equal across the two contexts (Model 2) and the model rerun. The goodness of fit indices also supported the fit of data to Model 2 (Table 8.8), indicating that the factor loadings for each of the latent variables’ manifest indicators are invariant across the occupation/study and family/relationships contexts. When the fit indices for Model 2 were compared to Model 1, there were no significant differences in the data’s goodness of fit, $\Delta \chi^2 = 5.86, p = .44$ (Table 8.8).

Next, in addition to the constraints already made to the model, the measurement intercepts and structural weights were constrained to equal across the two contexts (Model 3) and the model rerun. The goodness of fit indices supported the fit of data to Model 3, indicating that the structural paths between the latent variables are invariant across the occupation/study and family/relationships contexts. When the fit indices for Model 3 were compared to Model 2, there were no significant differences in the data’s goodness of fit, $\Delta \chi^2 = 13.74, p = .13$ (Table 8.8).

The model was rerun with the structural intercepts, means, and covariances also constrained to equal across the two contexts (Model 4). The goodness of fit indices supported the fit of data to Model 4, indicating that the each latent variable’s variance and covariance are invariant across the occupation/study and

---

4 Except for those measurement residuals already constrained following Bollen’s (1989) recommendation.
family/relationships contexts. When the fit indices for Model 4 were compared to Model 3, there were no significant differences in the data’s goodness of fit, \( \Delta \chi^2_1 = .47, p = .49 \) (Table 8.8).

The model’s structural residuals were then also constrained to equal across the two contexts (Model 5). The goodness of fit indices also supported the fit of data to Model 5, indicating that the error terms for each endogenous latent variable are invariant across the occupation/study and family/relationships contexts. When the fit indices for Model 5 were compared to Model 4, there were no significant differences in the data’s goodness of fit, \( \Delta \chi^2_5 = 3.97, p = .55 \) (Table 8.8).

Lastly, the model’s measurement residuals, the last remaining parameters, were also constrained to equal across the two contexts (Model 6). The goodness of fit indices supported the fit of data to Model 6, indicating a strict level of invariance across the occupation/study and family/relationships contexts. When the fit indices for Model 6 were compared to Model 5, there were no significant differences in the data’s goodness of fit, \( \Delta \chi^2_8 = 13.42, p = .10 \) (Table 8.8).

As there were no significant differences in the goodness of fit indices when Models 1 to 6 were compared, the original model (Model 1) that contained no parameter constraints was considered appropriate for use across the two contexts (Table 8.8).
Table 8.8

*Goodness of Fit Statistics for the Hierarchically Nested Models and their Comparisons*

<table>
<thead>
<tr>
<th>Hierarchically Nested Models</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>$\chi^2$/df</th>
<th>GFI</th>
<th>TLI</th>
<th>CFI</th>
<th>RMSEA</th>
<th>$p$/close</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1</td>
<td>147.91</td>
<td>98</td>
<td>.001</td>
<td>1.51</td>
<td>.92</td>
<td>.92</td>
<td>.94</td>
<td>.04</td>
<td>.75</td>
<td>.07</td>
</tr>
<tr>
<td>Model 2</td>
<td>153.77</td>
<td>104</td>
<td>.001</td>
<td>1.48</td>
<td>.91</td>
<td>.93</td>
<td>.94</td>
<td>.04</td>
<td>.80</td>
<td>.07</td>
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<tr>
<td>Model 3</td>
<td>167.51</td>
<td>113</td>
<td>.001</td>
<td>1.48</td>
<td>.91</td>
<td>.93</td>
<td>.94</td>
<td>.04</td>
<td>.81</td>
<td>.07</td>
</tr>
<tr>
<td>Model 4</td>
<td>167.98</td>
<td>114</td>
<td>.001</td>
<td>1.47</td>
<td>.91</td>
<td>.93</td>
<td>.94</td>
<td>.04</td>
<td>.82</td>
<td>.07</td>
</tr>
<tr>
<td>Model 5</td>
<td>171.95</td>
<td>119</td>
<td>.001</td>
<td>1.45</td>
<td>.91</td>
<td>.93</td>
<td>.94</td>
<td>.04</td>
<td>.86</td>
<td>.07</td>
</tr>
<tr>
<td>Model 6</td>
<td>185.37</td>
<td>127</td>
<td>.001</td>
<td>1.46</td>
<td>.90</td>
<td>.93</td>
<td>.93</td>
<td>.04</td>
<td>.85</td>
<td>.08</td>
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</table>

<table>
<thead>
<tr>
<th>Nested Model Comparisons</th>
<th>$\Delta\chi^2$</th>
<th>$\Delta df$</th>
<th>$p$</th>
<th>$\Delta\chi^2$/df</th>
<th>$\Delta$GFI</th>
<th>$\Delta$TLI</th>
<th>$\Delta$CFI</th>
<th>$\Delta$RMSEA</th>
<th>$\Delta$p/close</th>
<th>$\Delta$SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 2 vs. Model 1</td>
<td>5.86</td>
<td>6</td>
<td>.44</td>
<td>-.03</td>
<td>-.01</td>
<td>.01</td>
<td>.00</td>
<td>.00</td>
<td>-</td>
<td>.00</td>
</tr>
<tr>
<td>Model 3 vs. Model 2</td>
<td>13.74</td>
<td>9</td>
<td>.13</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>-</td>
<td>.00</td>
</tr>
<tr>
<td>Model 4 vs. Model 3</td>
<td>.47</td>
<td>1</td>
<td>.49</td>
<td>-.01</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>-</td>
<td>.00</td>
</tr>
<tr>
<td>Model 5 vs. Model 4</td>
<td>3.97</td>
<td>5</td>
<td>.55</td>
<td>-.03</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>-</td>
<td>.00</td>
</tr>
<tr>
<td>Model 6 vs. Model 5</td>
<td>13.42</td>
<td>8</td>
<td>.10</td>
<td>.01</td>
<td>-.01</td>
<td>.00</td>
<td>-.01</td>
<td>.00</td>
<td>-</td>
<td>.01</td>
</tr>
</tbody>
</table>

*Note.* Model 1 = All parameters are allowed to vary freely; Model 2 = Measurement weights are constrained to equal across contexts; Model 3 = Model 2 constraints with measurement intercepts and structural weights also constrained to equal across contexts; Model 4 = Model 3 constraints with structural intercepts, means, and covariances also constrained to equal across contexts; Model 5 = Model 4 with structural residuals also constrained to equal across contexts; Model 6 = Model 5 with measurement residuals also constrained to equal across contexts. Those measurement residuals constrained following Bollen’s (1989) recommendation described in Phase One were also constrained in Phase Two.
Discussion

The aim in Phase Two of this repeated measures study was to test the modified Cognitive-Affective Model of Decision-Making Stress and Satisfaction in relation to a decision participants had recently made regarding their family or their relationship. Forty-six per cent of Phase One participants also participated in Phase Two, a figure that Moser and Kalton (1989) suggested is better than an average response rate.

A test of participants’ Phase One data revealed no significant differences in age or on the study variables between those participants who subsequently responded at Phase 2 and those who did not. Chi-square analysis also failed to reveal any significant gender association between Phase Two participants and participants from Phase One who did not participate in Phase Two. These null findings suggest that there is no systematic response bias between Phase 1 and Phase 2, at least in terms of the current participants and their scores on the variables under study.

The DAS and MAS

Confirmatory Factor Analyses (CFA) of the Decision Appraisals Scale and the Metacognition Awareness Scale supported their relevant factor structures in the current data when answered in response to a decision related to participants’ family or relationship. The scales also demonstrated adequate internal reliabilities ($\alpha = .65$ and .80, respectively). The DAS and MAS were considered suitable for utilisation in the model testing.

Model Testing

The data provided overall support for the Cognitive-Affective Model of Decision-Making Stress and Satisfaction when applied to a decision related to participants’ family or relationship. The variables in the model accounted for 62% of
the variance in decision satisfaction, 75% of the variance in decision-making stress, 74% of the variance in decisional coping strategies, 17% of the variance in metacognitive acceptance, and three per cent of the variance in metacognitive awareness. These explained variances are consistent with those found in Phase One and support the appropriate specification of the model in a second context (Hair Jr. et al., 2010). As the total effects in the model are similar between Phase 1 and Phase 2, although related to a different decision in each case, these will not be discussed again here but rather the role of the manifest variables on the latent variables will be considered.

**Latent Factor Loadings.** The manifest components of decision appraisals, decision satisfaction, and metacognitive awareness and acceptance were all single summated factors and as such their factor loadings are high (.81 to .90). The weakest loading is for decision appraisals and it might be that this reflects the less than optimal level of internal reliability ($\alpha = .65$) for the scale (Hair Jr. et al., 2010).

While the appraisal types assessed in the DAS were in line with the literature (Commendador, 2011; Cooper-Martin, 1994; Janis, 1982; Janis & Mann, 1977; Maule et al., 2000; Okwumabua et al., 2003) it might be that future research could extend the appraisal items in this scale with a view to increasing its reliability.

The five manifest components of decision-making stress: (1) feeling uninformed about the available alternatives, (2) unclear about what options is most valued, (3) feelings unsupported by others, (4) uncertainty about what to decide and (5) the absence of positive affect, all loaded significantly onto decision-making stress (.44 to .71) and reflect the loadings found in Phase One. The contribution of the first four manifest components to decision-making stress supports Janis and Mann’s (1977) definition of decisional conflict or decisional stress. Interestingly, it
was participants’ feeling of uncertainty around their decision that demonstrated the highest loading and which can be seen as forming the basis of what Festinger (1942, 1957) termed cognitive dissonance and Janis and Mann (1977) termed decisional conflict.

In Phase Two, the second and third strongest indicators of decision-making stress are feeling unclear about what alternatives are more valued and feeling unsupported by others in their decision-making whereas in Phase One (an occupation/study context) they were the absence of positive affect and feeling uninformed about the available options. From these variations, it could be inferred that when participants were making a decision related to their family or relationship the greatest factor in their stress is the uncertainty they feel, followed by feeling unclear what alternatives are more valued and how supported they feel in their decision-making. In the occupation/study context however, the greatest factor in participants’ decision-making stress is again feeling uncertain, but this is coupled with the absence of positive affect and feeling uninformed about the available options. These variations might be due to the personal nature of decisions related to the family or relationships where the impact on and influences from others close to the decision-maker may be more predominant than in the occupation/study context, where decisions can be less personal and more professional- or business-like.

The absence of positive affect as an indicator of decision-making stress represents a novel addition to the literature. Its inclusion in the model followed the recommendation of Folkman (2008) and Folkman and Moskowitz (2000) who argued that it is important to consider both negative and positive affect when assessing mood. Clearly such a recommendation was supported in both phases of this study to date as, in Phase One negative affect failed to make any contribution to
participants’ stress although increasing levels of positive affect was shown to be a negative contributor to decision-making stress in both phases.

Each of the three types of decisional coping strategy: avoid the decision, change the situation, and change expectations contributed positively to the latent variable of decisional coping strategies but, as in Phase One, it was avoidance which was the strongest indicator (.65). As in Phase One, this finding is at first contrary to the broader coping literature (Folkman & Moskowitz, 2000; Lazarus & Folkman, 1984; Pearlin et al., 1981) where avoidance would be seen as an emotional coping strategy and typically would load negatively compared to attempts to change the situation and change one’s expectations as positive contributors to coping with stress. However, as mentioned earlier, avoidance is an emotion-focused strategy which, according to Folkman and Lazarus (1984) can occur in conjunction with attempts to be proactive. In fact, in their 1984 sample of medical students they reported that some 94% of that sample used emotion- and problem-focused strategies simultaneously.

It might also be inferred in the decision-making context that the indicators change the situation and change expectations, might also be forms of avoiding the decision. In that, participants may have avoided making their decision until they changed aspects of the situation to get what they wanted or changed their expectations until the decision appeared easier to make.

Although a sequential use of these coping strategies was not assessed in the current phases of this study, each of these suggestions has some theoretical merit in explaining why the three decisional coping strategies all load positively onto decisional coping. Clearly such a proposition warrants further investigation in subsequent research.
Invariance Testing

Invariance testing of the Cognitive-Affective Model of Decision-Making Stress and Satisfaction across the two phases of the study to date was systematically assessed using a series of hierarchically nested models with increasing parameter constraints. The data from Phase Two (family/relationships context) and Phase One (occupation/study context) were pooled and their goodness of fit to each of the six nested models was tested.

The goodness of fit of the data to each of the six nested models was supported, indicating that the Cognitive-Affective Model of Decision-Making Stress and Satisfaction determined in Phase One was valid in Phase Two. There were also no significant differences in the goodness of fit of the data when the nested models were compared against each other. These findings suggest that the Cognitive-Affective Model of Decision-Making Stress and Satisfaction is invariant across contexts: in this instance, decisions participants made regarding their occupation/study and their family/relationship. This invariance adds further confidence to the comparisons discussed earlier related to the model’s specification, explained variances, and the total effects. Whether the model is applicable in a health context will be the focus in Phase Three to be presented next.

Summary

The Cognitive-Affective Model of Decision-Making Stress and Satisfaction, tested in relation to a decision about participant’s occupation/study in Phase One, was re-tested in relation to a decision concerning their family/relationship in Phase Two. The factor structures and internal reliability of the DAS and the MAS were also confirmed and utilised in the model testing. The data provided good support for the model. Data from the current study when compared to that from Phase One,
revealed the invariance of the model across contexts. The findings in Phase Two further support the contributions that people’s decision appraisals, decision-making stress, use of decisional coping strategies, and metacognitive awareness and acceptance have on their decision satisfaction. The applicability of the model to a health-related decision will be tested in Phase Three of this longitudinal study.
CHAPTER NINE

Phase Three

Aims and Hypotheses

The aim in Phase Three is to replicate the modified Cognitive-Affective Model of Decision-Making Stress and Satisfaction determined in Phases One and Two (Figure 8.4), with respect to a decision participants had made within the past six months concerning their physical or mental health.

Method

Design

This is the third and final phase of a repeated-measures design (Figure 6.2) utilised to replicate the model concerning a decision made with respect to participants’ physical or mental health.

Participants

Fifty-four of the 84 participants from Phase Two (4 males, $M_{age} = 36.75$ years; $SD = 9.11$; and 50 females, $M_{age} = 39.76$ years, $SD = 12.56$) participated in the current phase of the study. A non-parametric Mann-Whitney $U$-test for unequal group numbers revealed no significant difference in age by gender, Mann-Whitney $U = 84.50$, $p = .48$. Of the female participants, 46% were married or living together with a partner, while 75% of the male participants were single. A Chi-square ($\chi^2$) test indicated no association between participants’ gender and marital status, $\chi^2_2 = 1.75$, $p = .42$. The current sample represents a 64% response rate of participants from Phase Two and a 30% response rate of participants from Phase One.

Procedure

Ethical approval for the conduct of this study was obtained from the Charles Darwin University Human Research Ethics Committee (CDU-HREC; Appendix
A reminder to participate in this final phase of the study (Appendix D.1) was emailed to those participants who provided their email address at the end of Phase Two. The emailed thanked them for their participation in the previous two phases of the study and for consenting to participate in this the third and final phase of the study focusing on a decision related to their physical and/or mental health. The email also contained a web link to the online survey http://cduhes.asia.qualtrics.com/SE/?SID=SV_eG83Guk3xPPL3ZH.

The web link provided a Plain Language Statement (Appendix D.2) and an advice to participants that they could withdraw from this phase of the study at any time by simply closing their Internet browser. They were also advised that completion and submission of the online survey (Appendix D.3) would be deemed to be their informed consent to participate in the current study phase. No incentives were offered for their participation.

**Materials**

All participants were required to provide their six-letter code, as well as demographic information on their age, gender, marital status and whether they were currently employed or engaged in study. These factors were used to match participants’ current scores on the study variables with their scores at Phases One and Two.

Participants were also required to complete the same scales that contributed to the model in Phase Two (Figure 7.3). The scales were answered in terms of a decision related to their physical or mental health made within the previous six months.

- The Decision Appraisals Scale (described in Phase One)
- The Metacognitive Awareness Scale (described in Phase One)
• The Acceptance and Action Questionnaire, Version II (Bond et al., 2011)
• The Decisional Conflict Scale (O'Connor, 1995)
• The Positive Affect subscale of the International Positive and Negative Affect Scale, Short Form (E. R. Thompson, 2007)
• The Avoidance, Change the Situation, and Change Expectations subscales of the Cybernetic Coping Scale-15 (Guppy et al., 2004).

A full description of each of the scales is provided in Chapter Seven.

Results

The data were analysed using the Statistical Package for Social Sciences (SPSS; Version 22). The statistical analyses were to be conducted in two phases: (1) analysis of the demographic data, and (2) structural equation modelling to test the Cognitive-Affective Model of Decision-Making Stress and Satisfaction in a physical/mental health decision context.

Demographics

Phase Three Participants. A series of analyses were conducted to determine if there were any systematic variations on the demographics of participants at Phase Two whose chose to participate in Phase Three (n = 54) and those who did not (n = 30).

A $\chi^2$ analysis revealed no association by gender at Phase Two by those participants who responded at Phase Three and those who did not ($\chi^2 = 1.73, p = .19$; Table 9.1), nor was there any significant age difference at Phase Two between responders and non-responders at Phase Three ($t_{82} = .18, p = .86$).
Table 9.1

*Phase 3 (P3) Responders versus Non-Responders from Phase 2 (P2) by Gender.*

<table>
<thead>
<tr>
<th>Gender (n [%])</th>
<th>P3 Participation</th>
<th>( \chi^2 )</th>
<th>Cramer’s V</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Responders (n = 54)</td>
<td>Non-Responders (n = 30)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>50 (92.6)</td>
<td>25 (83.3)</td>
<td>1.73 (^a)</td>
</tr>
<tr>
<td>Male</td>
<td>4 (7.4)</td>
<td>5 (16.7)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>54 (100.0)</td>
<td>30 (100.0)</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) \( p = .19 \)

**All Phases.** Further analyses were conducted to ascertain if there were any systematic variations by gender or age across those who chose to participate in all three phases of the study and those who did not.

A \( \chi^2 \) analysis revealed no association by gender by people who participated at Phase 1, Phase 2 and Phase 3, \( \chi^2 = 2.17, p = .34 \) (Table 9.2).

Table 9.2

*Participants’ Gender by Study Phase: Phase 1 (P1), Phase 2 (P2), and Phase 3 (P3)*

<table>
<thead>
<tr>
<th>Gender</th>
<th>Study Phase</th>
<th>( \chi^2 )</th>
<th>Cramer’s V</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P1</td>
<td>P2</td>
<td>P3</td>
</tr>
<tr>
<td>Female</td>
<td>147 (84.5)</td>
<td>73 (86.9)</td>
<td>50 (7.4)</td>
</tr>
<tr>
<td>Male</td>
<td>27 (15.5)</td>
<td>11 (13.1)</td>
<td>4 (7.4)</td>
</tr>
<tr>
<td>Total</td>
<td>174 (^a)</td>
<td>84 (100.0)</td>
<td>54 (100.0)</td>
</tr>
</tbody>
</table>

\(^a\) Eight participants at P1 did not indicate their gender.

\(^b\) \( p = .34 \)
A two-way ANOVA was used to compare participants’ age by gender across the three phases of the study. The analysis revealed no significant difference in age by gender across the three phases of the study however, males who participated at Phase 1 were significantly younger than females (Table 9.3).

Table 9.3

*Participants’ Age by Gender across Phase 1 (P1), Phase 2 (P2), and Phase 3 (P3)*

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age (years)</th>
<th>P1 (n = 174*)</th>
<th>P2 (n = 84)</th>
<th>P3 (n = 54)</th>
<th>F</th>
<th>df</th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>41.33 (12.25)</td>
<td>39.90 (12.53)</td>
<td>39.76 (12.56)</td>
<td>.48</td>
<td>2, 267</td>
<td>.003</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>36.04 (9.92)</td>
<td>36.27 (6.39)</td>
<td>36.75 (9.11)</td>
<td>.01</td>
<td>2, 39</td>
<td>.001</td>
<td></td>
</tr>
</tbody>
</table>

\[F\] 4.50*  
\[df\] 1, 172  
\[η²\] .02  

*Eight participants in Phase One did not indicate their gender.

*p < .05*

Model Testing

The current sample size of 54 derived from the original 182 participants in Phase One was insufficient to submit to structural equation modelling (Hair Jr. et al., 2010). Instead, a Repeated-Measures Multivariate Analysis of Variance (RM-MANOVA) was conducted to compare participants’ scores for each of the manifest variables in the model: metacognitive awareness and acceptance, decision appraisals, decision-making stress (uninformed, values unclear, unsupported, uncertain, and positive affect), decisional coping strategies (change situation, change expectations,
and avoid decision), and decision satisfaction scores by decision context (occupation/study, family/relationships, and physical/mental health). Only data from the 54 participants who participated in each of the three phases were utilised.

The RM-MANOVA revealed a significant, multivariate effect for decision type, Pillai’s Trace $F_{28, \, 160} = 2.11, p = .002$, partial $\eta^2 = .27$. The univariate tests indicated significant, within-participant differences in metacognitive awareness and change the situation, across the three contexts.

Post hoc analyses revealed that on average participants’ metacognitive awareness scores were significantly lower for their physical/mental health decisions, compared to their occupation/study and family/relationships decisions. Participants also scored lower on changing the situation for their family/relationships decisions, compared to their occupation/study and physical/mental health decisions. The effect sizes for these differences however, were small ($\eta^2 = .12$ and .11, respectively; Table 9.4).
Table 9.4

Cross-Context Differences in Participants’ Metacognitive Awareness, Metacognitive Acceptance, Decision Appraisals, Decision-Making Stress (Uninformed, Values Unclear, Unsupported, Uncertain, and Positive Affect), Decisional Coping Strategies (Change Situation, Change Expectations, and Avoid Decision), and Decision Satisfaction

<table>
<thead>
<tr>
<th>Variable</th>
<th>Occupation/Study M (SD)</th>
<th>Family/Relationships M (SD)</th>
<th>Physical/Mental Health M (SD)</th>
<th>F_{2, 92}</th>
<th>p</th>
<th>partial η^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metacognitive Awareness</td>
<td>19.21 (3.48) ^a</td>
<td>18.87 (3.10) ^a</td>
<td>17.19 (4.49)</td>
<td>6.49</td>
<td>.002</td>
<td>.12</td>
</tr>
<tr>
<td>Metacognitive Acceptance</td>
<td>20.17 (4.29)</td>
<td>19.00 (4.31)</td>
<td>19.79 (4.66)</td>
<td>1.45</td>
<td>.24</td>
<td>.03</td>
</tr>
<tr>
<td>Decision Appraisals</td>
<td>14.87 (2.55)</td>
<td>15.04 (2.65)</td>
<td>15.19 (2.79)</td>
<td>.28</td>
<td>.75</td>
<td>.006</td>
</tr>
<tr>
<td>Uninformed</td>
<td>6.21 (2.41)</td>
<td>6.04 (2.15)</td>
<td>6.19 (2.38)</td>
<td>.15</td>
<td>.86</td>
<td>.003</td>
</tr>
<tr>
<td>Unclear Values</td>
<td>6.47 (2.69)</td>
<td>6.25 (2.70)</td>
<td>6.53 (2.38)</td>
<td>.22</td>
<td>.80</td>
<td>.005</td>
</tr>
<tr>
<td>Unsupported</td>
<td>7.70 (2.73)</td>
<td>8.59 (2.67)</td>
<td>7.74 (2.96)</td>
<td>2.30</td>
<td>.11</td>
<td>.05</td>
</tr>
<tr>
<td>Uncertain</td>
<td>8.77 (2.80)</td>
<td>8.83 (2.69)</td>
<td>7.89 (2.87)</td>
<td>2.36</td>
<td>.10</td>
<td>.05</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>17.51 (3.95)</td>
<td>16.00 (4.31)</td>
<td>16.74 (4.48)</td>
<td>2.67</td>
<td>.07</td>
<td>.05</td>
</tr>
<tr>
<td>Change Situation</td>
<td>9.21 (3.28) ^a</td>
<td>7.47 (3.13)</td>
<td>8.95 (3.09) ^a</td>
<td>5.83</td>
<td>.004</td>
<td>.11</td>
</tr>
<tr>
<td>Change Expectations</td>
<td>8.81 (2.51)</td>
<td>8.79 (2.79)</td>
<td>8.36 (2.72)</td>
<td>.53</td>
<td>.59</td>
<td>.01</td>
</tr>
<tr>
<td>Avoid Decision</td>
<td>6.68 (2.86)</td>
<td>6.96 (3.20)</td>
<td>6.59 (2.50)</td>
<td>.32</td>
<td>.69</td>
<td>.007</td>
</tr>
<tr>
<td>Decision Satisfaction</td>
<td>16.25 (3.00)</td>
<td>16.36 (2.96)</td>
<td>15.83 (3.40)</td>
<td>.54</td>
<td>.59</td>
<td>.01</td>
</tr>
</tbody>
</table>

*Note.* Where *p* is significant, groups sharing a superscript do not differ at *p* < .05
Discussion

The aim in the final phase (Phase Three) of this repeated-measures study was to test the modified Cognitive-Affective Model of Decision-Making Stress and Satisfaction with respect to a physical or mental health decision the participants had made within the past six months. Sixty-four per cent of the 84 participants from Phase Two participated in Phase Three. This represents what Moser and Kalton (1989) suggested is a good response rate for repeated-measures designs.

A comparison of Phase Two demographics for people who responded at Phase Three and those who did not, revealed no systematic variations by gender or age. Furthermore, while the sample size decayed over time, analyses also revealed that there was no gender association by phases of the study however, at Phase One male participants were significantly younger than female participants.

Manifest Variable Comparisons by Decision Type

The small sample of 54 respondents at Phase Three precluded the use structural equation modelling. It was decided instead, to use the data from these 54 participants and compare their scores across the three phases of the study in relation to the three decision types: (1) occupation/study, (2) family/relationships, and (3) physical/mental health.

The Repeated Measures MANOVA revealed a global difference by decision type on the model’s manifest variables although univariately only metacognitive awareness and changing the situation differed significantly. When making decisions related to their physical or mental health, participants scored lower on metacognitive awareness of their thoughts and thinking processes than when making a decision related to their family or relationship and occupation or study. It might be that participants experienced a level of anxiety or stress greater than in the other
circumstances, when they were faced with a health decision and this stress had an impact on their metacognitive functioning. In this instance, their ability to be metacognitively aware of their thoughts and thought processes (e.g., I was [not] aware of my thoughts and thinking at the time) was reduced. Such a proposition is congruent with Mohlman (2009) who found that participants’ anxiety after receiving a first diagnosis of aged-related hearing loss was negatively related to a decreased ability to be metacognitive aware of their thinking at the time.

In addition, participants were less likely to focus on changing the situation to assist with their decision-making when confronted with a family or relationship decision compared with decisions related to their occupation or study and physical or mental health. It may be that the opinions and even the feelings of others, in this case family members or their partner, reduced options for respondents to change the situation. Certainly these suggestions warrant investigation in future research. It is important to note that these effects were small (11% and 12%, respectively) suggesting they were of little, substantive importance. There were no univariate differences on the other study variables.

On balance, it can be argued that the participants did not vary in their appraisal of the resources available to support them in their decision-making across the three contexts. Although there was some reduction in coping, in this case being less likely to change an aspect of the situation directly when making a decision related to their family or relationships, their use of decisional coping strategies was stable. So too was their levels of metacognitive acceptance, positive affect, and satisfaction with the decisions made. While metacognitive awareness (e.g., I was aware of my thoughts and thinking at the time) was lower with respect to a physical/mental health decision, but this change could be considered minor and
therefore their level of metacognitive awareness can be seen to be generally stable across all three types of decision.

A review of the descriptive statistics for each variable indicates that the mean scores were in the moderate to high range of possible scores, except for decision satisfaction, which was in the upper-end of the possible scoring range. It can be inferred from these results that the participants on average were able to positively appraise and manage the demand of their decision-making well.

These results may be limited by socially desirable responses with respect to their decision-making and this factor was not assessed in the three phases of this study. It might also be that the participants were biased due to the sampling methods utilised: advertisements to university students and the researcher’s Facebook page, thus limiting the generalisability of the results to the general population. While educational level was not sought from respondents it might also be, as a function of the sampling methods, the current respondents are well educated. This last might also have some impact on their ability to answer the survey questions, and how they engage in metacognitive processes. Nevertheless, it does seem that the Cognitive-Affective Model of Decision-Making Stress and Satisfaction is generally robust across the three decision types assessed here.

Summary

The aim of this last Phase of this longitudinal study to replicate the Cognitive-Affective Model of Decision-Making Stress and Satisfaction with regards to a third decision type (physical/mental health) was unable to be tested due to the small sample size. Instead, cross-context comparisons of the model’s manifest variables were made using a Repeated Measures MANOVA. Metacognitive awareness and the decisional coping strategy of changing the situation were the only
variables that differed across the three contexts albeit yielding small effects sizes thereby suggesting that the differences were of little, substantive importance. It can be inferred that the variables in the model were generally stable across the three decision types for this sample and therefore the Cognitive-Affective Model of Decision-Making Stress and Coping is generally robust across multiple decision types. Caveats on generalisation of the results to the broader population are warranted due to the sampling methods utilised.
CHAPTER TEN

Overall Discussion and Conclusion

Decisions involve making choices and people often experience stress over which decision will provide them with the most desirable or satisfying choice. How people make decisions has been studied for over a century in the psychological literature, but less so how people manage their decision-making stress and maximise their decision satisfaction. In their Conflict Theory, Janis and Mann (1977) referred to the conflict people experience while making important decisions. Lazarus and Folkman, in their Transactional Model of Stress and Coping, referred to the effects of appraisal and coping on stress, in this thesis, decision-making stress. It was argued therefore, that the integration of these theories would be more informative in understanding people’s stress and satisfaction while making decisions than either of these or any other decision theory alone.

In addition, consideration of people’s metacognitive awareness and metacognitive acceptance of their thoughts and thinking processes, proposed more recently in terms of increasing one’s psychological flexibility (Hayes et al., 2006; Hayes et al., 2011; Masuda et al., 2009), were also argued to have a role in determining people’s coping, decision-making stress, and hence their satisfaction with the decision made. By integrating the concepts of metacognitive awareness and acceptance with Janis and Mann’s Conflict Theory and Lazarus and Folkman’s Transactional Model of Stress and Coping, a Cognitive-Affective Model of Decision-Making Stress and Satisfaction was developed.

The aim in this thesis was to test the model in relation to decisions people made related to three separate life domains: (1) occupation/study, (2) family/relationships, and (3) physical/mental health. A longitudinal study involving
three phases of data collection was conducted to achieve this aim. This study will be briefly summarised followed by a larger discussion of the major findings.

**Summary of the Longitudinal Study**

In the first phase of this longitudinal study (occupation/study decision type), two scales not available in the extant literature were developed in order to test the model. These scales were found to have good psychometric properties and were named the Decision Appraisals Scale (DAS) to assess Janis and Mann’s concept of decision appraisals; and the Metacognitive Awareness Scale (MAS), to assess people’s awareness of their thoughts and thinking. The DAS and the MAS factors were then included as variables in the model testing.

After examination of the correlation matrix and the measurement model, negative affect and the coping strategy to use social resources were removed from the model as they failed to relate to the other variables. Overall, the data provided a good fit to the final, modified model. A considerable 61% of the variance in participants’ satisfaction with the decision they made was explained by the variables in the model. In addition, 81% of the variance in decision-making stress, 52% of the variance in decisional coping strategies, 36% of the variance in metacognitive acceptance, and 4% of the variance in metacognitive awareness was also explained. These findings indicate that the final model was appropriately specified (Hair Jr. et al., 2010).

In Phase Two of the longitudinal study (family/relationship decision type), the psychometric properties of the DAS and the MAS were confirmed and the model determined in Phase One was re-tested with respect to a family/relationship decision participants had made recently. The data provided a good fit to the model in this second decision context and, when compared to the Phase One data
(occupation/study decision type), was found to be invariant. This result indicates that the model is equivalent across occupation/study and family/relationship decisions and that reliable comparison of the model’s structure and effects can be made between these two decision types.

In the final phase (physical/mental health decision type), there were too few participants to use structural equation modelling. Instead, a repeated measures MANOVA was used to compare participants’ scores for each manifest variable in the model across the three decision types: (1) occupation/study, (2) family/relationships, and (3) physical/mental health contexts. Only data from the participants who participated in all three phases of the study were included. Although statistically significant differences in participants’ metacognitive awareness and the coping strategy of changing the situation were found, the effect size of these differences were small indicating that they are of little substantive importance.

The stability of the results across the three decision types indicates that the Cognitive-Affective Model of Decision-Making Stress and Satisfaction is robust across multiple types of decisions. The major findings in this thesis, and their implications, will be discussed next.

**Major Findings and Implications**

As the Cognitive-Affective Model of Decision-Making Stress and Satisfaction was robust across two decision types: (1) occupation/study and (2) family/relationship, and there were few differences on the variables at Phase Three, the major findings and their implications will be discussed in terms of the model’s potential application over most decision types. The maximisation of people’s decision satisfaction will be discussed first.
Maximising Decision Satisfaction. Decision satisfaction, in this instance, was defined as satisfaction with the decision made as well as making a well-informed decision that reflects what is important to the decision-maker and which they are unlikely to change (O’Connor, 1995). What are the factors that can have an impact on a person’s capacity to maximise such decision satisfaction? Although the level of stress people reported experiencing while making their decisions was the factor with the strongest, direct influence on people’s satisfaction with their decision, it is also how people appraise the situation in terms of the resources available and their ability to maintain a metacognitive awareness of their thoughts and thinking processes that were also important. The use of avoidance, or changing the situation or their expectations about a specific decision as coping strategies, together with maintaining a metacognitive acceptance of their thoughts however, do not appear to be major contributors to the overall outcome in terms of increasing decision satisfaction although they might be utilised in the management of any decision-making stress experienced.

These findings generally support Janis and Mann’s (1977) Conflict Theory and Lazarus and Folkman’s (1984) Transactional Model of Stress and also highlight how people’s metacognitions can play a role in maximising their decision satisfaction in accord with the recent developments in cognitive-behavioural therapies (Hayes et al., 2013; Hayes et al., 2006; Hayes et al., 2011); notably, Hayes et al.’s (2006) ACT framework. It may be that the ACT framework has much to offer people in terms of cultivating people’s metacognitions and minimising their stress, in order to make the most satisfying decisions possible. While not part of the exploration in this study, it might also be that metacognitive awareness and
metacognitive acceptance have an effect on people’s appraisals and this suggestion warrants investigation in future studies.

The contribution of positive appraisals, stress, and metacognitive awareness to achieving a satisfying decision outcome is in stark contrast to the early normative, heuristic, and process approaches to decision-making research. For example, normative decision researchers such as Ramsey and W. Edwards (1953), considered the maximisation of actual or expected utilities or prospects to be the primary factor in determining what people decided. It is clear from the model in this thesis however, that broader, more psychological factors are at play in people’s decision-making.

**Positively Appraising the Situation.** The ability of people to positively appraise their decision-making such that they perceive having the time and energy available, as well the capacity to find the best outcome and cope with making the decision, markedly decreases decision-making stress. In this thesis, the more positive participants’ decision appraisals were, the less the stress experienced, the more that coping strategies were employed, and the greater the likelihood of them making a decision with which they were satisfied.

These findings also are in line with Janis and Mann’s (1977) Conflict Theory and Lazarus and Folkman’s (1984) Transactional Model of Stress and Coping, wherein people’s appraisals are central to the perception of stress or conflict and influential on people’s use of coping strategies. How people appraise the demands of making a decision is clearly a similar process to that involved in appraising any demand or stressor: the greater the gap between the appraised demand and resources, the greater the stress (Lazarus & Folkman, 1984). In these studies, people’s positive secondary appraisal of the resources available to them (e.g., I thought that I had the
effort/energy needed to make the decision) clearly reduced their reported decisional stress. As in cognitive therapy more generally, clinicians working with people who are faced with decisional dilemmas could focus on fostering positive appraisals in order reduce their experience of stress and contribute to them making a more satisfying decision.

**Metacognitions and the Stress and Coping Dynamic.** Where the current model deviates from the literature is with the failure to support a direct, reciprocal relationship between decision-making stress and coping. Lazarus and Folkman (1984) and Janis and Mann (1977) argued that people’s stress, decisional or otherwise, directly increases their use of coping strategies that are then utilised to reduce the stress experienced. In fact, this reciprocal, stress and coping dynamic is a core element in the cognitive theories of stress and coping generally (Hobfoll, 1989; Pearlin & Schooler, 1978; Pearlin et al., 1981; Folkman, 2008; Folkman & Moskowitz, 2000). In the current model however, such direct, reciprocal effects between stress and coping were not present; yet these factors were still associated through metacognitive awareness and acceptance and, as such, coping did have an indirect effect on decision satisfaction.

The ability of participants to maintain a metacognitive acceptance of their thoughts and thinking processes was an intermediary factor between the intensity of their decision-making stress and subsequent use of decisional coping strategies. In the model, as decision-making stress increased in intensity, metacognitive acceptance levels decreased, which then lead to a reduction in the use of decisional coping strategies. Participants’ use of decisional coping strategies use however, increased their metacognitive awareness that then reduced their subsequent level of decision-making stress. This finding can be interpreted to suggest that people’s stress
decreased their capacity to maintain a metacognitive acceptance of their thoughts, but the presence of such metacognitive acceptance could increase people’s ability to cope with the stress felt. The relationship between people’s metacognitions, stress, and coping have certainly been the focus in recent developments in cognitive-behavioural therapies (Hayes et al., 2013; Hayes et al., 2006; Hayes et al., 2011). It might be that the coping scales used in this study, while the wording was adapted to specify decision-making, were not theoretically relevant. Future research to develop decision-making specific coping scales may yield more informative results.

Certainly, (Bandura, 1986), although referring to self-efficacy, has recommended the use of situation specific scales.

Clinicians might support people in cultivating their metacognitive awareness and acceptance of their thoughts and feelings as they arise while making important decisions. Indeed the cultivation of metacognitive awareness and acceptance has been supported in the literature as an efficacious method in the reduction of anxiety, distress, and avoidance behaviours (Atkinson & Wade, 2012; Bohlmeijer et al., 2011; Chapman, 2006; Ciarrochi, Bilich, & Godsell, 2010; Donaldson-Feilder & Bond, 2004; Folke et al., 2012; Gregg et al., 2007; Reneman, Dijkstra, Geertzen, & Dijkstra, 2010; Ruiz, 2012; Sharp, 2012; Wicksell, Olsson, et al., 2010). Such a therapeutic method might be conducted in the context of an ACT framework (Harris, 2009a; Hayes, 2004; Hayes et al., 2006) where maximising metacognitive awareness and acceptance is a central process in supporting people to choose and commit to a satisfying course of action that also is informed and consistent with the person’s life values. Limitations in the generalisability of these major findings to the broader population are discussed next.
Limitations

The model presented in this thesis addresses a gap in the literature in terms of a comprehensive model of decision-making stress and satisfaction incorporating elements of Janis and Mann’s (1977) Conflict Theory, Lazarus and Folkman’s (1984) Transactional Model of Stress and Coping, and more recent developments on metacognitive awareness and acceptance. While the model has good statistical and theoretical support, there are some limitations notably with the sampling method and the instruments used that could have an impact on the generalisability of the results.

The recruitment of participants through the researcher’s university and Facebook page may have based the sample in terms of their socio-economic status and education level, which were not assessed in this thesis. Participants scored in the moderate to high range of possible scores for each variable in all three phases of the study, therefore it may be that these participants were better able to appraise and manage their decision-making stress and reflect upon their decision satisfaction than might be the case more generally. They might also be more adept at being metacognitively aware and accepting when making decisions compared with the broader population. Of course, even among the university population and the researcher’s Facebook friends, there is also a possible response bias present in the data.

The convenience sampling method of adults with no specific inclusion or exclusion criteria limits the ability to generalise the results to the broader population. In addition, the online advertisement and administration of the studies limits the recruitment of participants and completion of the online surveys to people with access to the Internet, and email or a Facebook account. While this thesis is
primarily theoretical and explorative in nature, the samples utilised cannot be considered representative of the broader, adult population.

Another consideration also relates to the repeated measures design utilised across all three phases of data collection. While this design may have mitigated the impact of any within-participant variations, such as variations in age and personality traits (Hair Jr. et al., 2010), an element of recall bias may have been introduced between administrations of the online surveys. It also is possible that the amount of time that had passed from when participants had made the decision about the three areas: occupation/study, family/relationship, physical/mental health may have had an impact their ability to complete the online surveys accurately.

It is important to note however, that the response rates in Phase Two (64%) and Phase Three (30%) are in accord with what Moser and Kalton (1989) considered is good to excellent for repeated measures designs. Furthermore, the use of invariance testing in Phase Two allowed for reliable comparisons of the model across the current samples in different contexts.

The sample size in each study is also a consideration. Guidance from the literature on what sample size would have been best for conducting the structural equation modelling in Phases One and Two is varied. There are researchers such as Kline (2005) who recommended sample sizes in excess of 200 participants, while other researchers such as Tabachnick and Fidell (2007) cautioned against such large sample sizes as some of the goodness of fit indices are highly sensitive to sample size. In light of these recommendations, the results obtained from the structural equation modelling in Phases One and Two can be considered reliable. The sample size in Phase Three was too small to conduct structural equation modelling but adequate for the method of differences that was employed (Hair Jr. et al., 2010).
In addition, the use of self-report measures may have introduced bias into the results whereby participants’ scores are somewhat self-promoting or socially desirable. The intra-personal nature of the variables measured however, for example metacognitive awareness and decision appraisals, made it difficult to assess them using alternate methods such as behavioural observation.

Another possible limitation was the use of single-indicator latent variables in the assessment of both metacognitive awareness and acceptance. Whether multiple indicators of metacognitive awareness and acceptance would have increased the validity of the findings is unclear, although Gamez et al.’s (2011) initial development of a multi-subscale measure of experiential avoidance, a theoretically similar concept to metacognitive acceptance, might warrant further consideration. As the measures utilised in the current study exhibited both construct validity and adequate to strong internal reliability, any limitations related to the assessment of metacognitive awareness and acceptance may have been minimised. Also, as mentioned previously, a decision specific instrument to assess people’s coping might be more informative than the general coping scales used. Given these limitations, avenues for future research will be discussed.

**Future Research**

The Cognitive-Affective Model of Decision-Making Stress and Satisfaction highlights the relationships between people’s decision appraisals, stress, coping, and metacognitive awareness and acceptance that are stable across three decision types: (1) occupation/study, (2) family/relationships, and (3) physical/mental health. Future research might focus on extending the model in a number of ways.

The assessment of decision appraisals additional to the four included in the current scale (time available to decide, effort/energy required to decide, ability to
find the best outcome to the decision, and a general ability to cope) might be explored. The Decision Appraisals Scale (DAS) could be extended and its psychometric properties re-tested, to include any additional appraisals that may have an impact on people’s decision-making stress and satisfaction. Given that decision appraisals was found to be a strong, direct predictor of decision-making stress and the use of decisional coping strategies, the extension and re-testing of the DAS seems an important avenue for future research in this area.

The inclusion of proactive forms of coping such as positive reframing of the situation and pre-planning or goal-setting, in addition to the avoidant-based decisional coping strategies, written specifically for a decision-making context, might be included in the model. Comparisons between proactive versus avoidance coping in the reduction of people’s decision-making stress and increases in their decision satisfaction could then be made. Also, the use of social resources might be re-examined as a potential proactive coping strategy.

The impact of metacognitive acceptance on the use of proactive versus avoidance coping strategies could be explored. As metacognitive acceptance was found to act as an intermediary between participants’ decision-making stress and their use of decisional coping strategies which in this case included avoidance, an emotion-focused strategy, it may be that metacognitive acceptance can also lead to an increased use of proactive-based decisional coping strategies beyond changing one’s expectations. The intermediary role of metacognitive awareness between participants’ use of decisional coping strategies and their decision-making stress may also be enhanced with a more decision specific measure of coping.

The model could also be extended to include a wider assessment of metacognitive awareness, acceptance, and decision appraisals. While the
Metacognitive Awareness Scale (MAS) has good psychometric properties, a focus in future research might be on specific aspects of metacognitive awareness such as a metacognitive awareness of the use of avoidance and proactive decisional coping strategies. Also, now that metacognitive acceptance has been found to have some influence on how stressed people feel when making decisions across different decision types it may be helpful to understand further whether acceptance of specific types of thoughts when making a decision contributes to this effect. Lastly, additional items that reflect a broader spectrum of people’s decision appraisals might be included in the current Decision Appraisals Scale (DAS), retested for its psychometric properties, and included in a future test of the model.

In terms of future study designs, the model might be replicated using a prospective design wherein participants are asked to make a decision from predetermined scenarios. Such a design could reduce the dependence on memory recall that may have had an impact on the current results. Multiple decision-making scenarios could be presented in sequence to explore any practice effects on people’s decision appraisals, stress, coping, and metacognitive awareness and acceptance while making multiple decisions while at the same time removing any retrospective or maturational effects. These scenarios may or may not be from the same decision context.

The model might also be tested under laboratory conditions to mitigate any situational effects that could arise from completing an online survey at any time or place. Laboratory conditions could also be combined with the prospective design and the use of a series of pre-determined scenarios to further establish the relationships between people’s decision appraisals, stress, coping, and metacognitive awareness and acceptance.
In addition, these series of decision-making scenarios could be of increasing difficulty to explore whether the effects in the model are moderated by decision difficulty. This moderation would reflect Yerkes and Dodson’s (1908) performance-arousal framework in the context of decision-making stress and satisfaction. If “performance” is considered decision satisfaction and “arousal” is considered decision-making stress, then an inverted-U shaped relationship might be present between these two factors as the decision becomes increasingly difficult to make. There might also be differences in people’s decision appraisals, the types of decisional coping strategies people utilised, and their levels of metacognitive awareness and acceptance as the difficulty of the decision is systematically increased.

Despite the limitations of these studies, it is clear that people’s appraisal of the decision to be made was highly influential on their use of coping strategies and level of decision-making stress. The novel addition of metacognitive awareness on reducing decision-making stress and metacognitive acceptance in reducing emotion-focused coping adds significantly to the literature and to our understanding of decision-making stress and satisfaction. From these findings, it can be suggested that fostering clients’ positive appraisals and increasing their metacognitive awareness and acceptance will decrease their decision-making stress as well their levels of emotion-focused coping during the decision-making process.

**Conclusion**

Decision-making, once thought to be a simple matter of maximising utilities, has now been shown to be a very complex phenomenon that includes appraisals, stress, coping strategies, and metacognitive awareness and acceptance. These factors are presented in a Cognitive-Affective Model of Decision-Making Stress and
Satisfaction informed by the conflict approach to decision-making, cognitive theories of stress and coping, and recent developments in cognitive-behavioural therapies. The model was tested and replicated in a three-phase repeated measures study and was found to be robust across three decision types: (1) occupation/study, (2) family/relationships, and (3) physical/mental health.

The way the participants appraise their decisions, in terms of the amount of time, energy, ability to find the best outcome, and the general ability to cope, determined how stressed they felt. The indicators of this decision-making stress included feeling uninformed about the possible alternatives, unclear about what alternative is most valued, unsupported by others, uncertain about what to choose, and reduced positive affect. While decisional coping strategies were employed to reduce the stress felt, the effect was indirect through participants’ metacognitive awareness. The effect of participants’ decision-making stress on their use of decisional coping strategies was also indirect through participants’ metacognitive acceptance. The only significant, direct predictor of decision satisfaction was participants’ decision-making stress.

Clinicians might support people in their decision-making by focusing on how the decision is appraised, instead of what strategies are being utilised to make the decision, in order to reduce any stress and avoidance and increase the likelihood of people making a decision with which they are satisfied. Psychotherapeutic techniques aimed at cultivating metacognitive acceptance could be applied to reduce people’s avoidance of making a decision when experiencing stress. Metacognitive awareness might also be cultivated to reduce their decision-making stress when people are avoiding decision-making.
While there are limitations to generalising the findings from this thesis to the broader population, it has provided an innovative perspective on decision-making stress and satisfaction. The potential to confirm these findings in future studies of a prospective nature with pre-determined decision scenarios of varying difficulty would attest further to its stability across decision contexts. The application of these findings to persons faced with important decisions where they are conflicted over their choices is important, notably in terms of enhancing rather than challenging their cognitive appraisals, awareness and acceptance of the demand imposed upon them by the need to make a decision.
References


APPENDICES
APPENDIX A.1

Charles Darwin University Human Research Ethics Approval
14 September 2011

Mr James Lucas
Charles Darwin University
4/166 Victoria Street
BRUNSWICK VIC 3056

Dear Mr Lucas

Human Research Ethics Committee Project Application Approval

The Charles Darwin University Human Research Ethics Committee considered your application for ethics clearance for the abovementioned project at meeting 6/12, held on 11/22/2012.

Please find attached a notice of clearance.

The expiry date of ethics approval for your project is 22 November 2013. It is the responsibility of the researcher to ensure that ethics approval is renewed prior to the expiry date. If renewal is necessary, you will need to submit a progress report including a statement of compliance with ethical requirements, and detailing any proposed or actual changes to the project, which may affect its ethical acceptability. Renewal/Final Report forms are available from the Web at: http://www.cdu.edu.au/research/office/renew_final_04.rtf or from the Office of Research & Innovation.

If any significant alterations to your project are contemplated, or if any matters arise which may conceivably affect the continued ethical acceptability of the project, you are required to immediately notify the Human Research Ethics Committee by letter.

Our best wishes for the success of your project.

Yours sincerely

[Signature]

Professor Sharon Bell
Chair, Human Research Ethics Committee
APPENDIX B.1

Phase One Invitation to Participate

My name is James Lucas and I am conducting a research project as part of my Doctor of Philosophy degree, under the supervision of Professor Kate Moore. My thesis concerns people’s experiences of stress and how it might affect their decision-making in different contexts.

I invite you to participate in this study by completing an online survey about a decision you have made, or are still making, related to your job or study. The questionnaire will only take about 25-30 minutes of your time.

For further information about the study or to complete the survey please go to:

http://cduhes.asia.qualtrics.com/SE/?SID=SV_6R3J2Ea4hKCB68Q

You are not required to provide any identifying information and only group data will be analysed and reported.

If you have any further questions about this project please contact the primary researcher, James Lucas, on email james.lucas@students.cdu.edu.au

Thank you for your consideration.
APPENDIX B.2

Phase One Plain Language Statement
PLAIN LANGUAGE STATEMENT - SURVEY


CHIEF RESEARCHER: James Lucas, PhD Candidate, Charles Darwin University.

SUPERVISOR: Professor Kate Moore, Head of Psychology Theme, Charles Darwin University.

PURPOSE OF THE STUDY: The purpose of this study is to explore people’s experiences of stress and how these might have an impact on the social and emotional processes involved in the decisions they make related to their job or study.

BENEFITS OF THE STUDY: The results of the study will not benefit you personally, but will enhance our theoretical understanding of the social and emotional processes involved in people’s decision-making.

WHAT WOULD BE EXPECTED OF YOU?: If you decide to take part in this research you would be asked to complete an online survey, which will take about 25 to 30 minutes of your time. As well as providing information on your age, gender, current/recent work, and marital status, you will be asked to rate statements about a decision related to your job or study that you have made recently (preferably within the last 6 months). Examples of statements to rate include: I know which options are available to me, I know the benefits of each option, and I am choosing without pressure from others.

RISKS: There are no specific risks associated with your participation in this study. If however, you feel any distress you can contact Lifeline on 13 11 44, or CDU support and equity services (for CDU students) on 08 8946 6288.

CONFIDENTIALITY: Complete confidentiality and anonymity is assured, as you are not requested to provide any identifying information at any stage. Only group data will be used in the analyses, results, and in any publications.

YOUR PARTICIPATION: Participation is completely voluntary and anonymous and you are free to decline to participate without penalty of any kind. Further, you may withdraw from the research at any time prior to submitting the online survey by exiting the web page. As we have no identifying information, it will not be possible to remove your data once submitted.

Please Note: Completion and submission of the survey will be deemed to be your informed consent to participate in this study.
RESULTS OF THE STUDY: A summary of the results will be available on the CDU Psychology Website (http://www.cdu.edu.au/ehs/health/psychology/). The results will also form part of the chief researcher's PhD Thesis.

PERSONS TO CONTACT: If you have any questions about the project, please contact the chief researcher, James Lucas on email: james.lucas@students.cdu.edu.au. If there is an emergency or if you have any concerns before commencing, during, or after the completion of the project, please contact the Executive Officer of the CDU Human Research Ethics Committee on (08) 8946 6498, toll free number 1800 466 215, or email cdu-ethics@cd.edu.au. The Executive Officer can pass on any concerns to appropriate officers within the University.

ETHICAL GUIDELINES: This project will be carried out according to the Australian Code for the Responsible Conduct of Research, as defined by the National Health and Medical Research Council of Australia.

Thank you for devoting some time to reading this statement, and considering its contents.
APPENDIX B.3

Phase One Survey Questions
Demographic Information:
What is your gender?
- Male
- Female

What is your age (in years)? ________________

What is your current occupation (or most recent occupation if you are currently not working)? ________________

What is your Marital Status?
- Single
- Partnered
- Married/Living Together
- Divorced
- Other ________________

The Acceptance and Action Questionnaire, Version 2 (AAQ-II; Bond, et al., 2011) – a 10-item quantitative instrument measuring levels of experiential acceptance, answered on a 7-point Likert scale. For parsimony, only the 5 items with the highest factor loadings are included.⁵

Below you will find a list of statements. Please rate how each statement describes you OVER THE LAST 4 WEEKS.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Never True</th>
<th>Very Seldom True</th>
<th>Seldom True</th>
<th>Sometimes True</th>
<th>Frequently True</th>
<th>Almost Always True</th>
<th>Always True</th>
</tr>
</thead>
<tbody>
<tr>
<td>My painful experiences and memories make it difficult for me to live a life that I would value.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I'm afraid of my feelings.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I worry about not being able to control my worries and feelings.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My painful memories prevent me from having a fulfilling life.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotions cause problems in my life.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

⁵ The scale names and details are included here for information of the reader, but were not part of the online survey.
Five Items of Metacognitive Awareness in Decision-Making (developed for this study) – a five-item quantitative instrument measuring levels of metacognitive awareness in decision-making, answered on a five-point Likert scale.

This questionnaire is concerned with beliefs people have about their thinking. Listed below are a number of beliefs that people have expressed. Please read each item and indicate to what degree they describe you OVER THE LAST 4 WEEKS. Please respond to all of the items, there are not right or wrong answers.

<table>
<thead>
<tr>
<th>Beliefs</th>
<th>Not at All or Very Little</th>
<th>A Little</th>
<th>Somewhat</th>
<th>Very Much</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>I was aware of how I was evaluating the options available to me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I was aware of my thoughts and how I was thinking at that time.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I monitored my thinking constantly.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I paid close attention to my thoughts about each available option.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I was conscious of my thinking at that time.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Four Items of Decision Appraisals (developed for this study) – a four-item quantitative instrument measuring four types of decision appraisals, answered on a five-point Likert scale.

To what extent does each statement describe how you felt about the decision at the time?

<table>
<thead>
<tr>
<th>I thought that…</th>
<th>Not at All or Very Little</th>
<th>A Little</th>
<th>Moderately</th>
<th>Quite a Bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>There was enough time to make the decision.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I was hopeful of finding the best outcome from the decision.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I was able to cope with making the decision.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I had the effort/energy needed to make the decision</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The International Positive and Negative Affect Schedule Short Form Janis and Mann (1976, 1977) – a 10-item scale measuring levels of positive and negative affect and is answered on a five-point Likert scale.

This scale consists of a number of words that describe different feelings and emotions. Read each item and then indicate to what extent you felt this way WHILE WORKING THROUGH the decision you made, or are still making, from the last 4 weeks.

<table>
<thead>
<tr>
<th>I felt…</th>
<th>Very Little or Not at All</th>
<th>A Little</th>
<th>Moderately</th>
<th>Quite a Lot</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determined</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
</tr>
<tr>
<td>Attentive</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
</tr>
<tr>
<td>Alert</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
</tr>
<tr>
<td>Inspired</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
</tr>
<tr>
<td>Active</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
</tr>
<tr>
<td>Afraid</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
</tr>
<tr>
<td>Nervous</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
</tr>
<tr>
<td>Upset</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
</tr>
<tr>
<td>Ashamed</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
</tr>
<tr>
<td>Hostile</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
<td>🟦</td>
</tr>
</tbody>
</table>
The Decisional Conflict Scale (DCS; O’Connor, 1995) – a 16-item quantitative instrument measuring levels of decisional conflict, answered on a five-point Likert scale.

*Please reflect on the decision you made, or are still making, from the last 4 weeks, and rate to what extent the following thoughts or feelings came to mind...*

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree Nor Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I know which options are available to me</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I know the benefits of each option</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I know the risks and consequences of each option.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I am clear about which benefits matter most to me.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I am clear about which risks and consequences matter most.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I am clear about which is more important to me (the benefits or the risks and consequences).</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I have enough support from others to make a choice.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I am choosing without pressure from others.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I have enough advice to make a choice.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I am clear about the best choice for me.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I feel sure about what to choose.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>This decision is easy for me to make.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I feel I have made an informed choice.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My decision shows what is important to me.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I expect to stick with my decision.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I am satisfied with my decision.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
The Cybernetic Coping Scale-15 (CCS-15; Guppy et al., 2004) – a 15-item quantitative instrument measuring levels of coping strategies. Only the change situation, accommodation, and avoidance subscales were utilised. All items are answered on a five-point Likert Scale and have been adapted to the context of decision-making.

Below is a list of strategies people sometimes use to help them make a decision. Please read each item and indicate to what extent you would use the following strategies to help make your decision...

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>All of the Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>I tried to change the situation to get what I wanted.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I focused my efforts on changing the situation.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I worked on changing the situation to get what I wanted.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I made an effort to change my expectations.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I tried to turn to my attention away from the decision.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I tried to adjust my expectations to meet the situation.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I tried to adjust my own standards.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I tried to keep my mind off the decision.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I tried to avoid thinking about the decision.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
The Use of Social Resources Subscale of The Deakin Coping Scale (Moore, 2003) – a 4-item quantitative instrument measuring use of social resources. Items are answered on a five-point Likert scale.

The following questions ask about how you deal with demands or problems when making decisions. Please answer every question by selecting how much you did engage in each of these techniques to help make your decision...

<table>
<thead>
<tr>
<th>Discuss it with my family, friends, or colleagues.</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tell others about it.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Seek advice from others.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Seek help from others.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

Consent to Participate in Follow-Up Phase:
In order to compare responses with decisions you might make in other contexts, we would like to invite you to participate in a similar survey in one month from now.

Please indicate whether you agree to take part in this second assessment or not.
○ Yes
○ No

Participants who answered yes:
Please enter in the space below the first 3 letters of your mother’s name and the first 3 letters of your father’s name: ________________________
(e.g., if your mother’s name is Jane and your father’s name is John then enter JANJOH)

Please enter your email address for the survey link to be emailed to you in one month from now. This information is not linked to the survey you have just completed. It is not possible to link your responses in the survey to this email address: ________________________

Please re-enter your email address: ________________________

Participants were the presented with the end statement and submit button.
Participants who answered no, were presented directly with the end statement and submit button.

**End Statement:**
You have now reached the end of this questionnaire. Thankyou for your participation in this study. All you have to do now is press the "next" button and your answers will be submitted.
APPENDIX C.1

Phase Two Reminder to Participate in Next Survey

One month ago you kindly completed a survey as part of my Doctor of Philosophy degree and agreed to participate in a follow-up survey to explore how people make decisions in different contexts.

In this follow-up survey you will be asked to reflect over a meaningful decision related to your family, partner, or significant other and answer questions with respect to this decision. The follow-up survey will only take about 25-30 minutes of your time.

For further information about the study or to complete the follow-up survey please go to:

http://cduhes.asia.qualtrics.com/SE/?SID=SV_2h660pLOJv2RVCB.

You are not required to provide any identifying information and only group data will be analysed and reported.

If you have any further questions about this project please contact the primary researcher, James Lucas, on email james.lucas@students.cdu.edu.au

Thank you for your consideration.
APPENDIX C.2

Phase Two Plain Language Statement
PLAIN LANGUAGE STATEMENT - SURVEY


CHIEF RESEARCHER: James Lucas, PhD Candidate, Charles Darwin University.

SUPERVISOR: Professor Kate Moore, Head of Psychology Theme, Charles Darwin University.

PURPOSE OF THE STUDY: The purpose of this study is to explore people’s experiences of stress and how it might have an impact on the social and emotional processes involved in the decisions they make related to their family, relationships, or significant other.

BENEFITS OF THE STUDY: The results of the study will not benefit you personally, but will enhance our theoretical understanding of the social and emotional processes involved in people’s decision-making.

WHAT WOULD BE EXPECTED OF YOU?: If you decide to take part in this research you would be asked to complete an online questionnaire, which will take about 25 to 30 minutes of your time. As well as providing information on your age, gender, current/recent work, and marital status, you will be asked to rate statements about a decision related to your family, partner, or significant other that you have made recently (preferably within the last 6 months). Examples of statements to rate include: I know which options are available to me, I know the benefits of each option, and I am choosing without pressure from others.

RISKS: There are no specific risks associated with your participation in this study. If however, you feel any distress you can contact Lifeline on 13 11 44, or CDU support and equity services (for CDU students) on 08 8946 6288.

CONFIDENTIALITY: Complete confidentiality and anonymity is assured, as you are not requested to provide any identifying information at any stage. Only group data will be used in the analyses, results, and in any publications.

YOUR PARTICIPATION: Participation is completely voluntary and anonymous and you are free to decline to participate without penalty of any kind. Further, you may withdraw from the research at any time prior to submitting the online survey by exiting the web page. As we have no identifying information, it will not be possible to remove your data once submitted.

Please Note: Completion and submission of the survey will be deemed to be your
informed consent to participate in this study.

RESULTS OF THE STUDY: A summary of the results will be available on the CDU Psychology Website (http://www.cdu.edu.au/ehs/health/psychology/). The results will also form part of the chief researcher's PhD Thesis.

PERSONS TO CONTACT: If have any questions about the project, please contact the chief researcher, James Lucas on email: james.lucas@students.cdu.edu.au. If there is an emergency or if you have any concerns before commencing, during, or after the completion of the project, please contact the Executive Officer of the CDU Human Research Ethics Committee on (08) 8946 6498, toll free number 1800 466 215, or email cdu-ethics@cdu.edu.au. The Executive Officer can pass on any concerns to appropriate officers within the University.

ETHICAL GUIDELINES: This project will be carried out according to the Australian Code for the Responsible Conduct of Research, as defined by the National Health and Medical Research Council of Australia.

Thank you for devoting some time to reading this statement, and considering its contents.
APPENDIX C.3

Phase Two Survey Questions
ID:
Please enter in the space below the first 3 letters of your mother's name and the first 3 letters of your father's name: ______________________
(e.g., if your mother's name is Jane and your father's name is John then enter JANJOH)

Participants then completed the following scales (see Appendix G for scale descriptions and items):

- Demographic Information
- The Acceptance and Action Questionnaire, Version 2
- The Metacognitive Awareness Scale
- The Decision Appraisals Scale
- The International Positive and Negative Affect Schedule Short Form
- The Decisional Conflict Scale
- The Cybernetic Coping Scale-15
- The Use of Social Resources Subscale of The Deakin Coping Scale

Consent to Participate in Final, Follow-Up Phase:
In order to compare responses with decisions you might make in other contexts, we would like to invite you to participate in a similar survey in one month from now.

Please indicate whether you agree to take part in this third and final assessment or not.
☑ Yes
☑ No

Participants who answered yes:
Please enter your email address for the survey link to be emailed to you in one month from now. This information is not linked to the survey you have just completed. It is not possible to link your responses in the survey to this email address: ______________________

Please re-enter your email address: ______________________

Participants were the presented with the end statement and submit button.
Participants who answered no, were presented directly with the end statement and submit button.

End Statement:
You have now reached the end of this questionnaire. Thankyou for your participation in this study. All you have to do now is press the "next" button and your answers will be submitted.
APPENDIX D.1

Phase Three Reminder to Participate in Final Survey

One month ago you kindly completed a follow-up survey as part of my Doctor of Philosophy degree and agreed to participate in a final, follow-up survey to explore how people make decisions in different contexts.

In this final, follow-up survey you will be asked to reflect over a meaningful decision related to your physical or mental health and answer questions with respect to this decision. The follow-up survey will only take about 25-30 minutes of your time.

For further information about the study or to complete the survey please go to:

http://cduhes.asia.qualtrics.com/SE/?SID=SV_eG83Guk3xPPL3ZH

You are not required to provide any identifying information and only group data will be analysed and reported.

If you have any further questions about this project please contact the primary researcher, James Lucas, on email james.lucas@students.cdu.edu.au

Thank you for your consideration.
APPENDIX D.2

Phase Three Plain Language Statement
PLAIN LANGUAGE STATEMENT - SURVEY


CHIEF RESEARCHER: James Lucas, PhD Candidate, Charles Darwin University.

SUPERVISOR: Professor Kate Moore, Head of Psychology Theme, Charles Darwin University.

PURPOSE OF THE STUDY: The purpose of this study is to explore people’s experiences of stress and how it might have an impact on the social and emotional processes involved in the decisions they make related to their physical or mental health.

BENEFITS OF THE STUDY: The results of the study will not benefit you personally, but will enhance our theoretical understanding of the social and emotional processes involved in people’s decision-making.

WHAT WOULD BE EXPECTED OF YOU? If you decide to take part in this research you would be asked to complete an online survey, which will take about 25 to 30 minutes of your time. As well as providing information on your age, gender, current/recent work, and marital status, you will be asked to rate statements about a decision related to your physical or mental health that you have made recently (preferably within the last 6 months). Examples of statements to rate include: I know which options are available to me, I know the benefits of each option, and I am choosing without pressure from others.

RISKS: There are no specific risks associated with your participation in this study. If however, you feel any distress you can contact Lifeline on 13 11 44, or CDU support and equity services (for CDU students) on 08 8946 6288.

CONFIDENTIALITY: Complete confidentiality and anonymity is assured, as you are not requested to provide any identifying information at any stage. Only group data will be used in the analyses, results, and in any publications.

YOUR PARTICIPATION: Participation is completely voluntary and anonymous and you are free to decline to participate without penalty of any kind. Further, you may withdraw from the research at any time prior to submitting the online survey by exiting the web page. As we have no identifying information, it will not be possible to remove your data once submitted.

Please Note: Completion and submission of the survey will be deemed to be your
informed consent to participate in this study.

RESULTS OF THE STUDY: A summary of the results will be available on the CDU Psychology Website (http://www.cdu.edu.au/ehs/health/psychology/). The results will also form part of the chief researcher's PhD Thesis.

PERSONS TO CONTACT: If you have any questions about the project, please contact the chief researcher, James Lucas on email: james.lucas@students.cdu.edu.au. If there is an emergency or if you have any concerns before commencing, during, or after the completion of the project, please contact the Executive Officer of the CDU Human Research Ethics Committee on (08) 8946 6498, toll free number 1800 466 215, or email cdu-ethics@cdu.edu.au. The Executive Officer can pass on any concerns to appropriate officers within the University.

ETHICAL GUIDELINES: This project will be carried out according to the Australian Code for the Responsible Conduct of Research, as defined by the National Health and Medical Research Council of Australia.

Thank you for devoting some time to reading this statement, and considering its contents.
APPENDIX D.3

Phase Three Survey Questions
ID:
Please enter in the space below the first 3 letters of your mother's name and the first 3 letters of your father's name: __________________________
(e.g., if your mother's name is Jane and your father's name is John then enter JANJOH)

Participants then completed the following scales (see Appendix G for scale descriptions and items):
- Demographic Information
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- The Decision Appraisals Scale
- The International Positive and Negative Affect Schedule Short Form
- The Decisional Conflict Scale
- The Cybernetic Coping Scale-15
- The Use of Social Resources Subscale of The Deakin Coping Scale

End Statement:
You have now reached the end of this questionnaire. Thank you for your participation in this study. All you have to do now is press the "next" button and your answers will be submitted.
Publications and Presentations Arising from the Thesis

Publications


Conference Presentations
