Analysis of the Temporal Model of Perceived Control in Response to an Imagined Traumatic Event: Investigation of the measurement model and the relationships among temporal orientations and individual characteristics.

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This thesis applied a theory of meaning-making developed in the context of traumatic or stressful life events, the Temporal Model of Perceived Control (TMPC; Frazier, Berman, & Steward, 2002), to a new context – that of an imagined traumatic event. The study is linked with several areas of psychological research: the attribution literature, investigation of risk and resilience factors for Posttraumatic Stress Disorder (PTSD), and studies into the impact of meaning-making in posttraumatic recovery. The aim of the study was to test whether the TMPC could be applied to an imagined event and also to discern the relationships among temporal orientations and other individual characteristics known to influence posttraumatic recovery. The sample comprised 589 participants who completed a range of scales measuring individual differences, followed by the Perceived Control Over Stressful Events Scale (PCOSS), which was applied to an imagined traumatic event (an armed robbery at an Automatic Teller Machine). Statistical analysis comprised two stages. First, both exploratory and confirmatory factor analysis were utilised to determine whether the TMPC was a valid fit to the observed response to the PCOSS. Second, multiple and logistic regression were employed to determine significant predictors of each of the temporal orientations. The results demonstrated that, with a few adjustments, the responses to the imagined traumatic event aligned with the temporal orientations indicated by the TMPC. Significant and interpretable relationships were only found for the Present Control orientation. These analyses revealed that Ambivalent Attachment Type, Neuroticism, Optimism and Male gender were all significantly associated with Present Control; there was a negative relationship with Ambivalent Attachment and Neuroticism and a positive relationship with Optimism and male gender. Clinical implications are discussed for the treatment of PTSD and also for patients presenting with rumination and worry about crime. Future research into the relationship between Present Control and emotion regulation, as well as whether this orientation can be enhanced through treatment intervention, is recommended. It is concluded that the TMPC has some usefulness in understanding the lay theories that people may apply to traumatic events (actual and imagined). While the Present Control orientation was a robust construct that seemed highly applicable to a clinical context, the other temporal orientations did not appear as theoretically sound or clinically useful.
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DECLARATION

I declare that this report does not contain material which has been accepted for the award to the candidate of any other degree or diploma, except where due reference is made in the text of the report. I further declare that, to the best of my knowledge, this report contains no material previously published or written by another person except where due reference is made in the text of the thesis. Finally, I declare that the ethical principles and procedures specified by the Swinburne University Human Research Ethics Committee have been adhered to in the preparation of this report.

Danielle Williamson

Signed:
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People are not disturbed by things, but by the view they take of them.

-Epictetus (AD 55 – 135)
Chapter One: Overview of the Current Study

The current research investigates responses to an imagined traumatic event using the Temporal Model of Perceived Control (TMPC; Frazier, Berman, & Steward, 2001). The aim of this study is to better understand pre-existing meaning-making structures, and how these relate to other psychological attributes, such as personality, attachment type, or levels of emotional distress. The TMPC was developed as a theory of cognitive processes following a traumatic or stressful event. The TMPC contends that, following a traumatic event, people seek to regain a sense of personal control. This perception of control can have a past, present or future temporal orientation. It is proposed that the temporal orientations have differential relationships to posttraumatic adjustment; present control and future control are thought to be more adaptive than a past control orientation, primarily because an individual can reasonably exert greater influence over the present or the future than over past events (Frazier et al.).

Several studies have explored the relationships between temporal orientations and posttrauma outcomes (e.g., Frazier et al., 2001; Frazier, 2003; Frazier, Steward, & Mortensen, 2004; Frazier, Keenan et al., 2011), coping strategies (Frazier, Mortensen, & Steward, 2005), and posttraumatic growth (Frazier, Tashiro, Berman, Steger, & Long, 2004). In the most recent investigations (reported in Frazier, Keenan et al.) a questionnaire was developed, along with further examination of the temporal orientations. This series of studies established the measure of the TMPC, the Perceived Control Over Stressful Events Scale. It found that Present Control was associated with lower rates of distress across longitudinal and cross-sectional studies and was distinguishable from more general concepts of coping and control (Frazier, Keenan et al.). Past Control exhibited either no relationship or a positive relationship with distress, whereas the
adaptiveness of Future Control appeared to depend on the controllability of the stressor (Frazier, Keenan et al.).

An identified limitation of the Frazier, Keenan et al. (2011) study was that participants responded to a diversity of events when describing their meaning-making processes. Given that research has suggested that the nature of the event impacts posttraumatic adjustment (Breslau et al., 1998; Hetzel-Riggin & Roby, 2013), it can be argued that not controlling the event type introduced substantial variability into the interpretation of findings. A further theoretical issue was that many studies of meaning-making following trauma had not attempted to take into account the pre-existing attributional styles that people “brought with them” to traumatic events. To use the terminology utilised by attribution researchers, the “lay theories” of meaning-making regarding trauma had not been fully explored.

In the current research, it was decided to hold the type of event constant and to also conceptualise the temporal orientations as pre-existing meaning-making biases that people possess irrespective of whether they have experienced a traumatic event. In this regard, the temporal orientations described by the TMPC could form an aspect of risk or resilience factors that people “bring” to stressful and traumatic events. The current study also examined relationships between the temporal orientations and other individual characteristics such as: personality, attachment type, demographic features, and psychological distress.

The methodology involved using a vignette that asked the participant to imagine being the victim of an armed robbery (the vignette is provided in Appendix A). Participants then responded to a measure of the TMPC based on how they believed they would respond to such an event. This approach allowed for the type of event to be controlled without restricting the potential pool of participants. Vignette studies are also a commonly used methodology in the attribution literature. From a logistical perspective, using a vignette enabled the recruitment of a large sample,
which was important for the use of factor analytic techniques. In addition, with regard to ethical considerations, it was decided that asking people to reflect on an imagined event helped people hold the trauma at an “arm’s length” rather than possibly re-activating a past traumatic event. This was especially important given that the study was completed online, and there was no way of knowing how a person had responded to participating in the study or whether it had caused them distress.

The current study investigated one hypothesis and four research questions. Research questions were favoured over hypotheses as the current study involved a novel conceptualisation of the TMPC (i.e., as pre-existing meaning-making styles). It also applied this theory to a new context: an imagined event rather than an event that the participant had experienced.

The hypothesis was that the TMPC would be a valid representation of the meaning-making processes observed for the imagined traumatic event, measured by the adequate fit of this model to the data obtained. This hypothesis was tested using three-stage factor analysis: (1) exploratory factor analysis; (2) confirmatory factor analysis to calibrate the measurement model; and (3) confirmatory factor analysis to validate the measurement model. Research Question 1 encompassed further exploration of this fit and asked: What are the similarities and differences between the TMPC as it applies to imagined event, compared with past research with actual traumatic events?

The remaining three research questions applied to the examination of relationships between the temporal orientations and a range of individual characteristics (e.g., Attachment type, Neuroticism, Extraversion, previous trauma experience, demographic features). Research Question 2 asked: What is the nature of the relationships between the temporal control orientations and other individual characteristics? Research Question 3 asked: Do any of the individual characteristics uniquely predict the present, past or future control orientations? Finally, Research Question 4 was: How
do the relationships identified between the temporal orientations and the individual characteristics compare to the adaptiveness of these variables suggested by research into risk factors for posttraumatic stress disorder? Research Questions 2 to 4 were investigated using correlational analysis, followed by multiple and logistic regression.

In the next two chapters the theoretical and empirical background for the current study is provided. Several fields of psychological research are described. Chapter Two presents the findings in relation to meaning-making in a more general sense; Chapter Three covers the literature in relation to meaning-making in the wake of traumatic events, including the TMPC. Chapter Three also describes a theoretical model of PTSD and summarises literature on risk and resilience factors for this disorder. Following this, Chapter Four synthesises the material and establishes the aims, research questions and hypothesis for the current study. Chapter Five outlines the methodology and details the preparation of the dataset for analysis. Chapters Six and Seven contain the data analysis, the results of which are interpreted in Chapter Eight. Finally, Chapter Nine considers the limitations of the current study, discusses the clinical implications of the findings and offers suggestions for future research.
Chapter Two: Making Sense of the Self, Others, and Situations – Overview of Meaning-Making Theories.

2.1 Introduction.

This chapter reviews the literature related to humans’ fundamental propensity to make sense of their environment, to perceive coherence and causality, and to formulate explanations for their behaviour and the behaviour of others. Meaning-making is linked to the concept of theory of mind; it stems from our ability to generate representations of mental states. The meaning created from mental representations operates as a tool for self-regulation as well as social interaction (Malle, 2004).

As with many abstract concepts, defining meaning is a difficult and contested endeavour. A definition proposed by Baumeister (1991), and adopted by Park (2010) in her critical review, stated that meaning is a “mental representation of possible relationships among things, events, and relationships. Thus, meaning connects things” (p. 15). The concept of connection predominates in several theoretical approaches to meaning. For example, narrative perspectives highlight the importance of time and sequencing in the human experience (i.e., the order in which things occur); storytelling becomes the mechanism for connecting events (Crossley, 2000; Sarbin, 1986). Malle (2004) highlights meaning as a striving for understanding “one thing in its relationship to other things” (p. 64), with the aim of restoring coherence and fitting a “strange event” within a network of pre-existing representations. Also emphasising coherence, Park’s critical review of meaning-making following trauma argued for the need to have consistency between global meaning and situational meaning. Global meaning was defined as general orienting systems and include concepts such as beliefs, goals and subjective feelings. It is related to the notion of schemas and represents the cognitive structures that a person develops early in life which filter their perceptions of subsequent events (Park). Situational
meaning was defined as the meaning attributed to a specific event. It is more fluid and involves the determination of whether the event can be explained by global meaning structures (Park).

This chapter focuses on meaning-making in everyday situations; Chapter Three examines meaning-making in the context of stress or trauma. Building from Heider’s (1958) work, in which folk psychology and lay understanding of cause and effect were highlighted as worthy of scientific study, attribution has been studied extensively. Kelley and Michela (1980) define attribution as “the perception or inference of cause” (p. 458). The terms “ascribing causality”, “causal meaning-making” and “attribution” will be used interchangeably in this literature review.

This chapter explores causal meaning-making through first detailing some of the core assumptions of the current study. Namely, that causal understanding is a “developmental primitive” which is acquired early in life (during infancy); is fundamental to the development of other skills; operates similarly across people of all ages, intellectual abilities and cultures; and is implicit (occurs automatically) (Corrigan & Denton, 1996). Once the fundamental nature of causal meaning-making has been established, an outline of prominent theories in this area is presented. This includes summarising the work on attribution theory and introducing a more recent framework of behavioural explanations: the folk theory of mind and behaviour (Malle, 2004). This chapter forms the basis for the investigation of meaning-making in a more specific situation – in the aftermath of a traumatic event (Chapter Three).

2.2 Causal understanding as a critical human ability.

The current study is based on the premise, explored extensively by Corrigan and Denton (1996), that causal understanding is a basic human process or “developmental primitive”. Features of causal understanding include its establishment in infancy, its reliance on implicit processes, and its universality. In this section recent empirical work supporting this
assumption is briefly described. This provides the foundation for the theories described later in the chapter.

As with other basic processes, such as language or motor skills, the building blocks for causal understanding can be detected in young infants. Piaget, a prominent developmental theorist, observed that babies exhibited an awareness of causality from age six months onwards (1928/2009) when they realise that their actions or gestures can produce a response (e.g., pulling a string to make a mobile move). A recent study by Schlottmann, Ray, & Surian (2012) investigated causal understanding in four- to six-month old infants. The study reported the results of two tests of causal understanding: (1) a “launch” condition in which one shape appears to “launch” the other into movement (the shapes move simultaneously only briefly); and (2) a “reaction” condition in which one shape moves in response to another that appears to be “chasing” it (Schlottmann et al.). The researchers found that the perception of causation for both events emerged at around six months, where infants appeared to know that one event causes another. This understanding of causation continues to mature and becomes more complex, however the foundational skills are among the earliest processes acquired by humans.

An additional feature of causal understanding is its universality and lack of sensitivity to culture, intellectual ability, age and education (Corrigan & Denton, 1996). Ramachandran, Mitchell, and Ropar (2009) investigated this in their study of trait inference in people with autism spectrum disorders (ASD). The spontaneous inference of traits from behaviour relates to theory of mind and interpersonal interactions – it involves ascribing intentions and motivations to other’s behaviour. As people with ASD are thought to have deficits in theory of mind, Ramachandran et al. were interested in whether their abilities to infer traits from behaviour were also impaired. Contrary to expectations, they discovered that “individuals with ASD inferred the traits implied in the
described behaviour effortlessly and spontaneously” (Ramachandran et al., p. 877).

Ramachandran et al. (2009) also found that participants, both with ASD and normal controls, prioritised the inference of traits over other descriptive classifications of the information being presented, such as the action being performed or semantic association with the words of the sentence. In addition, there was evidence that this occurred without conscious awareness (i.e., it was an implicit process). Implicit processes were also investigated by Hassin, Bargh, and Uleman (2002). They conducted three studies focused on spontaneous causal inferences. Hassin et al. concluded that the “epistemic hunger” (p. 520) for causes drives the cognitive system to derive causal understandings for events even when the cause is not explicitly stated or when the task at hand does not require it. Kahneman (2011), who described a range of implicit processes and cognitive biases in his recent book Thinking Fast, Thinking Slow, also outlined a number of studies which documented the unconscious drive to form a causal story for events and behaviours.

In summary, several studies support the existence of causal meaning-making as a basic cognitive process. While the current review has not explored this topic in detail, the significance of causal understanding is well established in the literature. What is open for discussion, however, are the mechanisms by which people arrive at causal understandings, the biases that exist, and the impact of causal meaning-making on other aspects of human behaviour, such as interpersonal interactions or recovery from trauma. The subsequent sections of this Chapter, and Chapter Three, examine these areas more thoroughly.

2.3 Attribution theory.

The study of attribution has a clear beginning in the publication of Heider’s book The Psychology of Interpersonal Relations in 1958 (Reisenzein & Rudolph, 2008). Heider conceptualised people as “folk
psychologists”. He proposed that human behaviour could be understood by elucidating their “naïve” theories of how the world, and the people within it, operated. Heider’s work inspired psychologists, such as Jones and Davis (1965) and Kelley (1967; 1973), to investigate and further refine theories of causal understanding and meaning-making, such that attribution theory became a dominant paradigm in social psychology throughout the 1970s and 80s (Weiner, 2008). While its influence has waned in recent decades, attribution theory retains its utility across a number of psychological domains and underpins the current study. In this section, Heider’s work is summarised, along with some of the key findings of several decades of empirical investigation into attribution. As with the previous section, this review presents an overview of the area rather than an in-depth analysis. Findings with relevance to the current study are prioritised.

2.3.1 Common-sense psychology. One of the central contributions of Heider’s (1958) work was his emphasis on individuals’ intuitive understanding of psychological principles, particularly as they related to interpersonal relations (i.e., interactions between two people). He saw individuals as employing a “naïve psychology” in the ways in which they formed ideas about social situations and others. This understanding guided their behaviour and enabled predictions to be made. Heider was not concerned with the accuracy of these principles, but focused instead on their pervasiveness across humans and the ramifications of their use. Heider was also interested in using intuitive understanding of human behaviour, such as that demonstrated in fiction writing, to inform the development of general principles which could be subjected to empirical investigation.

Causal attribution was identified as being of great importance in interpersonal behaviour; deciding what caused a particular event significantly affects a person’s reaction to it (Heider, 1958). Cause was linked with additional concepts, such as ability (what can a person achieve?), effort (is the person trying?) and desire (does the person want a
particular outcome?) Later interpretations of Heider’s work (e.g., Jones & Davis, 1965; Kelley, 1967) emphasised the distinction between internal (person-centred) or external (environmental) causes. This initial distinction formed a starting point for other dimensions of causal meaning-making to be described, such as the stability of the cause, its controllability and its globality (e.g., Abramson, Seligman, & Teasdale, 1978; Weiner, Heckhausen, Meyer, & Cook, 1972; Weiner, 1979). More recently, Malle (2004) offered a critique of these dimensions and contended that the most important distinction is between intentional and unintentional events. The subsequent sections provide further detail on the development of theory regarding causal meaning-making.

**2.3.2 The internal/external dimension.** Kelley is one of the most often-cited researchers in the attribution literature. His theory was an attempt to highlight the ideas in Heider’s work and “present them in a systematic way” as a basis for empirical research (Kelley, 1967, p.192). Kelley (1967; 1973) proposed that the decision about whether an event was caused by the situation (external) or the person (internal) was critical to making attributions. It was further hypothesised that people employed a scientific approach “analogous to experimental methods” (Heider, 1958, p. 297) whereby the covariation of cause and effect was analysed (Kelley, 1973). According to Kelley’s theory, attribution to an external source is made when an impression is: distinctive (it uniquely occurs when the thing is present); consistent (it occurs every time the thing is present); and there is consensus (it is experienced in the same way by all observers).

Kelley and Michela (1980) offered a comprehensive review of attribution theory and research, with an emphasis on the internal/external dimension. They divided the research into studies that focused on the antecedents of attributions and those that emphasised the consequences of attributions. Factors impacting on the antecedent-attribution link included: the information available to the attributor (e.g., covariation of cause and
effect, the influence of salience and primacy); *a priori* beliefs of the.attributor (e.g., beliefs about situations or actors, causal schemata); motivations (e.g., the influence of personal interests on whether an attribution will be made and the type of attributions made); and actors’ versus observers’ attributions (Kelley & Michela).

Of relevance to the current study were some of the findings presented regarding the impact of motivation on the attribution process. These motivations included the need to preserve self-esteem and the desire to maintain a sense of personal control. Kelley and Michela (1980) reported that research supported a greater tendency for internal attributions for success and external attributions for failure as this protected self-esteem. Kelley and Michela also highlighted research into the “just world hypothesis” (Lerner & Miller, 1978), which proposed that people attributed negative events occurring to others to internal causes in order to maintain the belief that they can control whether such an event happens to them. These findings relate to the current research in that they touch on biases that may exist in making sense of traumatic events, particularly with regard to perceptions of control. This is explored in greater depth in Chapter Three (Section 3.3.2.1).

Research into the consequences of attributions involved looking at attributions as a cognitive factor that influenced other psychological processes (Kelley & Michela, 1980). For example, Kelley and Michela described research that established that intrinsic or extrinsic motivation could impact on attributions and behaviour. In a study by Lepper, Greene, and Nisbett (1973) kindergarten children were divided into two groups: some were given “good player” awards for drawing with textas (an extrinsic reward) whereas others were not. In a subsequent “free play” session, those who had not received an award played with the textas for longer than those who had received an award. It seemed that the act of receiving an award switched the attribution from “I’m playing with textas because I enjoy
them” to “I’m playing with textas to get a reward”, and thus the texta play became less enjoyable (Lepper et al., 1973).

Investigating the consequences of different types of attribution has parallels to research described in Chapter Three (Section 3.3) that looks at how the content of the meaning made after traumatic events differentially impacts post-traumatic adjustment. The emphasis on the consequences of attributions is connected to Frazier and colleagues’ Temporal Model of Perceived Control, used in the current research, which makes predictions about the impact of stressful life events based on attributions of control and temporal orientation (i.e., past, present, future).

Kelley and Michela (1980) also touched upon research into other attributional dimensions: stability, generality and controllability. These dimensions are summarised in the next section.

2.3.3 Locus, stability, controllability and generality dimensions. As research into causal meaning-making continued, it became clear that the internal-external dimension could not adequately capture the diverse range of attributions people made. Working within the context of what motivates academic achievement, Weiner et al. (1972) conceptualised the internal-external dimension in terms of locus of control (following the work of Rotter, 1966) and added a stability dimension (stable-unstable attribution of cause). According to Weiner et al., locus of control referred to the ascription of responsibility to the person (internal) or the environment (external), whereas stability described the perceived fluctuation of cause over time. In a later paper, Weiner (1979) changed the locus of control dimension to locus of causality and added a third dimension: controllability. These dimensions, and examples of how they relate to causal attributions, are presented in Table 2.1.
Table 2.1.

Attribution Based on Locus, Controllability and Stability Dimensions.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Internal</th>
<th>External</th>
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<tbody>
<tr>
<td></td>
<td>Stable</td>
<td>Unstable</td>
</tr>
<tr>
<td>Controllable</td>
<td>Typical effort</td>
<td>Immediate effort</td>
</tr>
<tr>
<td></td>
<td>Teacher bias</td>
<td>Unusual help from others</td>
</tr>
<tr>
<td>Uncontrollable</td>
<td>Ability</td>
<td>Mood</td>
</tr>
<tr>
<td></td>
<td>Task difficulty</td>
<td>Luck</td>
</tr>
</tbody>
</table>

Adapted from Weiner, 1979.

Weiner (1979) described a primary function for each of the three dimensions, as well as noting several secondary effects. The stability dimension primarily impacted on expectancies for success or failure for future events; failing in the context of typical effort or high task difficulty has been shown to have a greater impact on motivation for future tasks than if failure is attributed to luck or low effort for that task only. The locus dimension was thought to influence self-esteem, whereby success or failure attributed to ability or typical effort is more powerful than that attributed to teacher bias or help from others. Weiner also noted that the stability dimension is important in the linkage between locus and self-esteem – a cause that is internal and stable will have a greater emotional impact than one that is internal but unstable.

Finally, the controllability dimension was examined in terms of the impact on other people’s behaviour. Weiner (1979) reported that people were more likely to offer help if the cause of the problem was seen to be outside the individual’s control (e.g., help was more readily offered to a student that struggled due to limited ability than one who struggled due to lack of effort.) He also stated that sentiment towards people with negative situations (e.g., loneliness) was more positive when the cause was
uncontrollable (e.g., no option to socialise) than controllable (e.g., rude
towards others).

Emerging contemporaneously with the work on attributions was
Seligman and colleagues theorising about learned helplessness and its
implications for understanding depression (e.g., Hiroto & Seligman, 1975;
Klein, Fencil-Morse, & Seligman, 1976; Klein & Seligman, 1976; Miller &
Seligman, 1975; Seligman, 1975). The concept of learned helplessness
developed from the observation that if response and reinforcement were
experienced as unlinked, motivation would be significantly reduced
(Seligman, 1975). This pattern was reported across studies with animals and
with humans. Miller and Seligman (1975) applied this theory to depression
and found that the responses of untreated depressed participants on an
anagram-solving task were analogous to the responses of non-depressed
participants who had just been exposed to an inescapable noise (designed to
elicit helplessness).

In their reformulation of the learned helplessness hypothesis,
Abramson et al. (1978) emphasised the importance of an attributional
framework; “when a person finds that he is helpless, he asks why he is
helpless” (p. 50). They proposed that a key attributional dimension was
generality. This dimension captures an individual’s assessment of whether
they believe their experience to be global (i.e., occurring across multiple life
domains) or specific (i.e., occurring only in this domain or instance). The
generality dimension was also incorporated with stability and
internal/external dimensions, as depicted in Table 2.2.

Abramson et al. (1978) proposed attributions that are global imply
that helplessness will be experienced across multiple situations, whereas
specific attributions impact on a narrower range of activities. Chronicity
resulted from attributions that are global and stable, whereas those that are
global and unstable were likely to be more transient. The internal/external
dimension, as with Weiner’s (1979) interpretation, was linked to self-
Table 2.2.

Attribution Based on Locus, Stability and Universality Dimensions.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Internal</th>
<th>External</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Stable</td>
<td>Unstable</td>
</tr>
<tr>
<td>Global</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failing Math</td>
<td>Lack of</td>
<td>Exhaustion</td>
</tr>
<tr>
<td>Student</td>
<td>intelligence</td>
<td>(having a cold,</td>
</tr>
<tr>
<td></td>
<td>(laziness).</td>
<td>which makes me</td>
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<tr>
<td></td>
<td></td>
<td>stupid).</td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rejected Woman</td>
<td>I’m unattractive</td>
<td>My conversation</td>
</tr>
<tr>
<td></td>
<td>to men.</td>
<td>sometimes bores</td>
</tr>
<tr>
<td></td>
<td></td>
<td>men.</td>
</tr>
<tr>
<td>Specific</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failing Math</td>
<td>Lack of</td>
<td>Fed up with</td>
</tr>
<tr>
<td>Student</td>
<td>mathematical</td>
<td>maths problems.</td>
</tr>
<tr>
<td></td>
<td>ability.</td>
<td>(Having a cold,</td>
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<tr>
<td></td>
<td>(Math always</td>
<td>which ruins my</td>
</tr>
<tr>
<td></td>
<td>bores me).</td>
<td>arithmetic).</td>
</tr>
<tr>
<td>Rejected Woman</td>
<td>I’m unattractive</td>
<td>My conversation</td>
</tr>
<tr>
<td></td>
<td>to him.</td>
<td>bores him.</td>
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Adapted from Abramson, Seligman, & Teasdale, 1978.

Esteem, whereby global, internal attribution impacts self-esteem more so than external attribution. Abramson et al. proposed that depression could be more deeply understood, and effectively treated, by acknowledging the attributional bases and working to change these. The premise that attributions play a key role in psychological distress or wellbeing, and are important treatment targets, is central to the current study. The application of this idea in relation to adjustment to stressful life events is explored in greater depth in Chapter Three.

2.3.4 Summary of attribution theory. This section has highlighted research, predominantly from the 1960s and 1970s, into attributions that have formed the foundation for later studies. Working from Heider’s (1958) proposal that people’s naïve theories of the world are vital
for understanding interpersonal behaviour, this research explored a number of attributional dimensions: internal versus external; stable versus unstable; gobal versus specific; and controllable versus uncontrollable. It was suggested that attributions influence a range of other experiences, such as motivation, achievement, mood and self-esteem. In the next section, Malle’s (2004) critique of the traditional paradigm is presented, alongside his folk theory of mind and behaviour.

2.4 The folk theory of mind and behaviour.

Malle (2004) contended that a key issue with traditional attribution theory is the failure to incorporate Heider’s (1958) distinction between intentional and unintentional behaviours (see also Reeder, 2009). He argued that previous theories had emphasised the internal/external distinction without acknowledging whether the event that the person is making sense of is intentional (e.g., being asked out for a drink) or unintentional (e.g., feeling hot/cold/happy/angry). This section outlines the key features of Malle’s folk theory of mind and behaviour as a framework for understanding how people form behavioural explanations, both for themselves and for others. It includes discussion of: (1) the importance of intentionality; (2) the development of behavioural explanations; (3) the motivation for behavioural explanation; (4) features of behavioural explanations for intentional events; and (5) empirical evidence, including findings from studies into trait inference.

2.4.1 The importance of intentionality in behavioural explanations. Following on from his interpretation of Heider’s (1958) work, Malle (2004) argued that for intentional events people form attributions for the reasons for acting, whereas for unintentional events people seek causes. For the example of being asked out for a drink, the person may question whether the invitation is a date (e.g., “in the preceding conversation we were talking about being recently single”), or whether it is an expression of friendship (e.g., “I have heard that several others are going
along to the drink too”). In the unintentional event example of feeling hot, people seek causes along the lines proposed by traditional attribution theorists, such as external explanations (e.g., “The temperature is over 35 degrees today”) or internal explanations (e.g., “I have a tendency to feel the heat”).

The distinction between causal explanations and reasons was also highlighted much earlier by Buss (1978), however, his critique was not commonly incorporated into subsequent attribution research (Malle, 2004). Buss defined causes as “that which brings about a change” and reasons as “that for which a change is brought about (e.g., goals, purposes, etc.)” (p. 1311). In a more recent paper, Reeder (2009) also stressed the critical importance of distinguishing between intentional and unintentional behaviours when “mindreading” (i.e., making inferences about other people’s behaviour).

2.4.2 The development of behavioural explanations. Malle (2004) situated his framework in the development of theory of mind; in other words, the means through which people understand their own mind and that of others. This begins with an understanding of intentionality and goal-directedness (at between 6-18 months), and moves towards understanding that different people operate with differing desires (at around two years old), beliefs (at around four years old), and dispositions (i.e., personality; at around six or seven years old) (Malle & Holbrook, 2012). Malle (2004) further argued that having a “theory of mind” had evolutionary advantages, either by enabling others to be outsmarted for selfish gain (the Machiavellian perspective) or by allowing people to coordinate their behaviour (e.g., group activities such as hunting, caring for children, division of labour).

2.4.3 The motivations for behavioural explanations. Malle (2004) proposed two broad motivations for forming behavioural explanations: finding meaning and managing social interaction. Behavioural explanations
that are motivated by finding meaning seek to place an event within its relationship to other things and maintain coherence with pre-existing knowledge structures. The use of behavioural explanations to manage social interactions helps people form and maintain connections with others. These two motivations are considered in turn.

Finding meaning brings intrinsic pleasure. The sometimes intense discomfort experienced when meaning structures are disrupted has been examined in relation to traumatic events. This is explored in depth in Chapter Three and is highly relevant to the current study. Finding meaning also occurs in the context of relationship breakdown (Harvey, Orbuch, & Weber, 1992) or in generating formulations in psychotherapy or medicine (Day, 2004). Behavioural explanations function as a way to predict future events, self-regulate, and manage other’s behaviour (Malle, 2004).

With regard to the second motivation, to manage social interactions, sharing behavioural explanations with others is important for guiding their impressions, generating an emotional response or directing their behaviour (Malle, 2004). In this case, the focus is on the meaning achieved for the other in the interaction, with the aim being to reach a shared understanding. An example is when people give explanations for their behaviour to avoid giving offence (e.g., “I’m sorry I’m running late, my bus didn’t arrive on time”). This helps to maintain the relationships between people, which is connected to the human need for affiliation.

2.4.4 Behavioural explanations for intentional events. In addition to proposing two motivations for behavioural explanations, Malle (2004) also elaborated upon three types of explanation that emerge from intentional events: reason explanations, causal history of reason explanations, and enabling factor explanations. The relationship between these explanations and intentional behaviours is depicted in Figure 2.1.
Figure 2.1. The relationships between behavioural explanations and intentional behaviour.

According to Malle (2004), reasons are generated from the assessment of the actor’s state of mind (e.g., “Susan left the party because she was upset when a drink was spilled on her dress”). The causal history of reasons concept describe the context from which reasons develop (e.g., “Susan is sensitive and prone to feeling embarrassed. Therefore, she left the party when her dress was ruined as she felt too embarrassed to stay”). Causal histories often emphasise personality traits or past events. Enabling factor explanations focus on how an intention or disposition to act in a particular way was translated into the action itself (e.g., “Susan has just broken up with her boyfriend, who was at the party, which made her particularly sensitive about her appearance”).

2.4.5 Empirical support for the folk theory of mind and behaviour. Malle (1999) tested his theory empirically with a series of studies conducted with undergraduate university students. In the first two studies he investigated the distinction between intentional and unintentional behaviours. In Study One, participants were provided with one of two behaviours (i.e., “Anne was driving above the speed limit” and “Vince interrupted his mother”) paired with either a: belief reason, desire reason, person cause, or situation cause. They then had to rate the degree to which the behaviour was intentional. Malle found that the people who received
reasons rated intentionality significantly higher than those provided with causes.

In Study Two, participants were provided with 20 different behaviours and asked to: (1) rate the intentionality; and (2) write a short explanation for the behaviour. The explanations were coded by researchers as either a reason or a cause. Correlational analysis found that intentionality ratings were very strongly linked to whether a cause or reason was given as an explanation (Malle, 1999).

Study Three investigated the distinction between reason explanations and causal history of reason explanations (see Figure 2.1 for a depiction of how these operate in Malle’s theory). Malle (1999) tested whether people discriminate between reasons and causal histories of reasons by presenting participants with three behaviours and eight explanations for each. Four of the explanations were reasons and the other four were causal histories. Participants were asked to indicate which of the eight explanations were reasons (a term defined as “something that the agent had on his or her mind when deciding to act”) (Malle, p. 34). The responses supported a clear distinction between reasons and causal histories, which indicated that these represented different concepts. There was some indication that group behaviours generated more causal history responses than individual responses but this was not further explored.

More recently, Malle and Holbrook (2012) investigated the hierarchy of inferences made in social situations. They looked at the order in which people made inferences about an agent’s intention, desires, beliefs and personality. These studies tested whether personality traits were inferred the fastest (as suggested by Fiske & Taylor, 2008 or Molden, 2009), or whether inferences occurred in the order that they developed (i.e., intentions and desires first, followed by beliefs, followed by traits). They found that the latter hierarchy was most accurate for ambiguous behavioural events (as opposed to those tailored for trait inferences). The inference of traits is
somewhat akin to causal histories, whereas the inference of intentions, desires and motives are part of the reasons concept.

2.4.6 Summary. In summary, Malle’s (2004) folk theory of mind and behaviour emphasises the distinction between explanations of intentional and unintentional events, and suggests that the processes underlying these explanations differ. Malle has also suggested that explanations to find meaning are held privately, whereas those that manage interactions are communicated to others. The former seek to resolve the dissonance activated by unexpected events – in Chapter Three it is argued that this is partly motivated by a need to regain a sense of personal control. The latter are linked to maintaining social connections and fostering belonging and cooperation.

Malle’s conceptual framework provides a more complex and nuanced description of the function of behavioural explanations than the attribution theories that preceded it. This framework informs the development of the current study, in which folk explanations of an imagined traumatic event were investigated in relation to an established theory of meaning-making and post-traumatic recovery. In particular, Malle’s concept of causal histories of reason is relevant to looking at how pre-existing factors may shape meaning-making processes.

2.5 Chapter Summary.

In this Chapter, theories regarding how people make sense of themselves and their surroundings have been presented. This began with establishing causal meaning-making as a “developmental primitive” (Corrigan & Denton, 1996) which is observed universally, develops early in life and operates implicitly. Following this, the traditional perspective on attributions was presented, emphasising the work of Heider (1958), Kelley (1967), Weiner (1979) and Abramson et al. (1978). These theorists examined the dimensions that guide the identification of cause: internal
versus external, stable versus unstable, controllable versus uncontrollable, and global versus specific.

Next, Malle’s (2004) critique of the traditional approach to attribution was presented, alongside his folk theory of mind and behaviour. Malle’s conceptual framework emphasised the distinction between behavioural explanations for intentional versus unintentional acts. He also highlighted the role of behavioural explanations in finding meaning and facilitating social interaction.

In the next chapter, causal meaning-making is examined in the context of trauma and stressful life events. In particular, the notion that meaning-making can impact post-traumatic adjustment is closely examined. Finally, a theoretical model encompassing notions of perceived control and temporal orientation is presented. This model is utilised in the current study with regard to lay explanations for an imagined traumatic event.
Chapter Three: Meaning-Making and Trauma – the Link Between Behavioural Explanations and Posttraumatic Adjustment.

3.1 Introduction.

As discussed in the previous chapter, humans have a fundamental propensity to make sense of themselves, their environment and the people around them. This is driven by a need for coherence, which in turn engenders a sense that the world is predictable and controllable (Janoff-Bulman, 1992). Meaning-making is a universal process that is acquired early in life, operates automatically, and impacts numerous life domains (Corrigan & Denton, 1996).

Research described in the previous chapter focused on the structure of, and motivations for, behaviour explanation; however, this review only touched on the bearing that the meaning-making process can have on other aspects of human functioning. In this chapter, meaning-making is investigated in a more specific context: trauma, particularly trauma resultant from interpersonal violence. The focus is on the ramifications of particular approaches to meaning-making, with an emphasis on the relationship with posttraumatic adjustment. It is argued that meaning-making forms a vital component of recovery in the aftermath of trauma, and that some “meanings made” appear to be more adaptive (i.e., they promote wellbeing and resilience) than others.

The chapter is comprised of four sections and reviews literature that directly informed the current study. First, there is discussion of the impact of traumatic events themselves, including: what constitutes a trauma; theoretical understandings of posttraumatic stress disorder; and identified risk and resilience factors for posttraumatic psychopathology. Second, theory relating directly to meaning-making and adjustment to trauma is described. This includes Janoff-Bulman’s (1992) notion of “shattered assumptions” and Park and Folkman’s (1997; Park, 2010) differentiation
between situational and global meaning structures. Third, the literature linking meaning-making and posttraumatic adjustment is outlined, incorporating an exploration of the conflicting findings. Fourth, a specific model of meaning-making following trauma is presented: the Temporal Model of Perceived Control (Frazier, Berman, & Steward, 2002). This theory, and the empirical literature surrounding it, is discussed in depth as it forms the basis for the current study.

3.2 The impact of trauma: theoretical models, vulnerabilities, risk factors, and resilience.

Traumatic events encompass a wide range of situations, including criminal victimisation, war, natural disasters, life-threatening illnesses, motor vehicle accidents, and childhood abuse or neglect. Common to all traumatic events is the experience of intense fear, helplessness, loss of control, and the threat of annihilation (Andreasen, 1985).

The clinical diagnosis most directly linked with exposure to trauma is Posttraumatic Stress Disorder (PTSD; described in the preceding paragraph), however, other psychiatric conditions – such as depression, substance use disorders, anxiety disorders and borderline personality disorder – are also associated with trauma (e.g., Boudreaux, Kilpatrick, Resnick, Best, & Saunders, 1998; Johnson, Maxwell, & Galea, 2009; McCauley, Kileen, Gros, Brady, & Back, 2012; Pagura et al., 2010). Community studies of the U.S. population have estimated that between 51% (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995) and 69% (Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993) of adults will experience a traumatic event (as defined by criterion A of the diagnostic criteria for PTSD; DSM IV-TR; American Psychiatric Association, 2000). In their analysis of Australian data, provided by the Australian Bureau of Statistics’ National Survey of Mental Health and Wellbeing (1997), Creamer, Burgess, & McFarlane (2001) reported that 64.6% of men and 49.5% of women had experienced a traumatic event.
In DSM 5 (American Psychiatric Association [APA], 2013) PTSD has been moved from the Anxiety Disorders category into a newly created *Trauma and Stress or Related Disorders* category. Posttraumatic Stress Disorder has been described according to five broad criteria (APA, 2013). The first, Criterion A, states that the person must have experienced (either directly or indirectly) a traumatic event. The remaining criteria encompass symptom clusters, of which a person must have at least one symptom from clusters B and C and at least two symptoms from clusters D and E. These symptom clusters are: Intrusion symptoms (Cluster B; e.g., flashbacks, intrusive memories, dreams); Avoidance symptoms (Cluster C; e.g., persistent avoidance of thoughts or memories); Negative alterations in cognition or mood (Cluster D; e.g., persistent negative mood, anhedonia, persistent negative expectations); Alterations in arousal or reactivity (Cluster E; e.g., irritability, hypervigilance, problems with concentration, disturbed sleep).

While it is likely that all victims of trauma experience emotional distress, the severity and duration of this response exhibits significant individual differences. Lifetime prevalence of PTSD was estimated to be 7.8% (Kessler et al., 1995); this means that a significant portion of the 51.2% that experience trauma do not exhibit ongoing psychopathology or meet the diagnostic criteria for mental illness. The recovery process was captured in a longitudinal study that measured PTSD symptoms in recent survivors of rape (Rothbaum, Foa, Riggs, Murdock, & Walsh, 1992). They found that while the presence of symptoms was very high within a fortnight of the assault (94% of the sample), by the fourth assessment (on average 94 days after the assault) 47% of survivors were still experiencing PTSD symptoms. While this remained a large proportion, it is apparent that many women experienced a reduction in PTSD symptoms over time.

Understanding the risk and resilience factors in post-traumatic recovery has been the focus of much research. It is undoubtedly important
in the formulation of strategies for early intervention and the development of psychological treatments. Recent literature has highlighted the importance of clarifying vulnerabilities, consistent with a diathesis-stress model of psychopathology, whereby the traumatic event interplays with endogenous factors to heighten or decrease the risk of PTSD (Ingram & Price, 2009). The current research examined pre-existing meaning-making styles, and hence fits within the notion of cognitive vulnerability.

In order to better understand PTSD and the factors that influence posttraumatic recovery, the remainder of this section has three sections: (1) theoretical models of PTSD; (2) vulnerability and risk factors; (3) resilience factors. The literature presented emphasises concepts that are relevant to the current study, particularly cognitive processes. The findings regarding vulnerabilities, risk and resilience factors guided the selection of variables for the current study and the choice of methodology.

### 3.2.1 Theoretical models of posttraumatic stress disorder

Before investigating the factors that confer risk or resilience in the development of PTSD, a theoretical foundation for this disorder is explicated. A number of theories have been conceived to explain how PTSD is established and maintained (see Brewin & Holmes, 2003, for a review). Some of these emphasise emotion-processing (e.g., Foa & Rothbaum, 1998); some highlight the importance of memory structures (e.g., Brewin, Dalgleish, & Joseph, 1996); whereas others focus on the role of cognitive functioning (e.g., Ehlers & Clark, 2000; Janoff-Bulman, 1992).

Due to the focus of the current research on cognitive processes (i.e., attribution and meaning-making), the Ehlers-Clark model is the most relevant theory. Theoretical models are returned to in Section 3.2 as a basis for discussing the importance of attribution and meaning-making following trauma; the model discussed in this section is a more comprehensive treatment of PTSD and provides a basis for understanding risk and resilience factors more broadly.
Ehlers and Clark’s (2000) influential theory of PTSD proposed that a critical factor in the maintenance of posttraumatic distress is the ongoing perception of serious, immediate threat (Brewin & Holmes, 2003). They described two mechanisms that maintain this sense of threat: (1) overly negative appraisals of the event and its consequences; (2) a disruption in autobiographical memory processes. Added to these, changes to the negative appraisals and memory problems are impeded by behavioural and cognitive strategies, primarily driven by avoidance, that further entrench the problem.

Appraisals of the trauma and its secondary impact are akin to the behavioural explanation processes described in Chapter Two. Given that trauma is commonly viewed as an intentional event (particularly in the case of interpersonal violence whereby another individual perpetrates the crime), these appraisals fall within Malle’s (2004) concept of “reasons” for why the event occurred and the current experience of symptoms. Subsequently, these reasons impact on behavioural intentions and the person’s emotional experiences. According to Ehlers and Clark (2000), typical appraisals of people with persistent PTSD included: an overgeneralisation of the riskiness of normal activities; an excessive fear of the event re-occurring; appraisals that linked the cause of the event to the self; and negative appraisal of the trauma sequelae (e.g., the belief that flashbacks meant that you were deranged).

Negative appraisals were thought to increase psychopathology in two ways. First, the beliefs can encourage avoidance behaviours (Ehlers & Clark, 2000). For example, an individual who was assaulted by an intoxicated person while socialising with friends may overgeneralise the risk of being assaulted while out to include all kinds of social activities where alcohol is served. The person may feel less anxiety while avoiding situations perceived as risky, however this works to further entrench the belief in the longer term. Second, the appraisals can generate negative
emotion in and of themselves (Ehlers & Clark). In a manner similar to the impact described by attributional theorists, a belief that a trauma occurred due to a personal characteristic (i.e., an internal, stable and global attribution) could heighten emotional responses such as sadness, guilt or shame, and lead to low self-esteem.

Empirical investigations into the cognitive factors in persistent PTSD conducted with survivors of physical or sexual assault supports the impact of negative appraisals on symptom severity (Dunmore, Clark, & Ehlers, 2001; Fairbrother & Rachman, 2006). Moreover, Dunmore et al. highlighted that cognitive processing during the assault, and maladaptive control strategies to reduce the symptoms (such as avoidance), also significantly contribute to PTSD severity. In this study the affect persisted even after the impact of gender and assault severity was statistically controlled.

In summary, the cognitive model of PTSD offers a compelling account as to why PTSD sometimes develops and persists in survivors of trauma. It has been broadly utilised in the study of trauma, as evidenced by the Ehlers and Clark (2000) article being cited in over 1,300 studies listed on the EBSCOhost PSYCHinfo database. The role of negative appraisals is conceptualised as central in the maintenance of symptoms as they generate negative emotion and encouraged behavioural avoidance. The impact of cognitive appraisals is returned to throughout this thesis as it is critical to the current study and to meaning-making more generally.

3.2.2 Vulnerability, risk and resilience in the development of PTSD. Diathesis-stress models propose that the traumatic event – the “stress” – interacts with pre-existing vulnerabilities and posttrauma circumstances – the “diathesis” – to produce PTSD in some individuals (McKeever & Huff, 2003). The elucidation of vulnerabilities and risk factors for developing PTSD is therefore essential for understanding the heterogeneity of responses and possible causal mechanisms. Several authors
have argued that understanding vulnerability is a critical step towards developing effective early intervention and treatment strategies (e.g., Bomyea, Risbrough, & Lang, 2012; Elwood, Hahn, Olatunji, & Williams, 2009; Ingram & Price, 2009). This section outlines vulnerabilities identified in the empirical literature, as well as other peri- and post-trauma risk factors. Methodological concerns, which pervade this area of research, are also considered.

3.2.2.1 Cognitive vulnerabilities. In their recent review, Bomyea et al. (2012) divided cognitive vulnerability into two categories: general cognitive functioning, which includes intelligence and neuropsychological performance (predominantly executive functioning); and cognitive biases, which encompass attributional style, rumination, negative appraisals, fear of emotions and “looming” cognitive style. The cognitive biases most directly relevant to the current study – negative attributional style and negative appraisals – are now discussed.

Empirical work on negative attributional style has utilised findings on learned hopelessness and attribution (outlined in Section 2.3.3 of the previous chapter) to argue that a tendency to attribute events to internal, global and stable characteristics increases the likelihood of developing PTSD (Elwood, Mott, Williams, Lohr, & Schroeder, 2009). Results from studies of a variety of traumatic events (e.g., natural disasters, interpersonal violence, serious illness) broadly support this notion (e.g., Gray & Lombardo, 2004; Greening, Stoppelbein, & Docter, 2002; Joseph, Yule, & Williams, 1993; Mikulincer & Solomon, 1988; Sherrer, 2011; Zinzow & Jackson, 2009), however, conflicting findings suggest that the relationship between attribution style and PTSD may be more complex. For example, Elwood et al. (2009) found that negative attributional style was correlated with PTSD symptoms, yet it was not an independent predictor (i.e., the relationship was mediated by other variables).
Researchers have also predominantly studied attributional style following the traumatic event, making conclusions about negative attributional style as a vulnerability problematic. It is difficult to disentangle what may have been a pre-existing explanatory style from the impact on attributions caused by the event itself. The examination of the attribution-distress relationship relates directly to the current study and is explored comprehensively in Sections 3.3 and 3.4.

As discussed in relation to the Ehlers-Clark model (Section 3.1.1), negative appraisals have been found to be a critical element in maintaining PTSD. Clarifying the role of pre-existing negative appraisals as a vulnerability to PTSD has been hampered by an absence of prospective studies. An exception to this is Bryant and Guthrie’s (2007) research with newly recruited fire-fighters. They measured appraisals about the self during training (prior to trauma exposure) and again four years later. Their analysis showed that negative self-views accounted for 20% of the variation in PTSD severity at the second time-point. The authors concluded that negative self-appraisal was a vulnerability factor. In addition, a prospective study of Police Officers by Yuan et al. (2011) found that high self-esteem (considered a positive cognitive appraisal) measured during training was related to lower distress after two years service. These studies identify the significant role of pre-existing appraisals, however, their generalisability is limited by the fact that restricted samples were used (i.e., people from the emergency services sector rather than a community sample).

3.2.2.2 Biological vulnerabilities. Bomyea et al. (2012) identified several biological vulnerabilities to PTSD, which fell within the categories of genetic factors and neuroendocrine response factors. In their review of biological factors in PTSD, Pitman et al. (2012) also identified the role of psychophysiological functioning and structural brain issues. The contribution of genetic factors to PTSD is estimated to be between 30% (e.g., Kremen, Koenen, Afari, & Lyons, 2012; Scherrer et al., 2008) and
72% (Sartor et al., 2011), with many of the same genes involved as in other forms of psychopathology (Pitman et al., 2012). In terms of the neuroendocrine system, the cortisol response appears to be particularly relevant, with high cortisol levels a possible cause of peri-traumatic dissociation and heightened acute stress after the traumatic event (Inslicht et al., 2011).

3.2.2.3 Personality traits. Personality variables have also been examined as vulnerability factors for PTSD. One of the most frequently studied traits is Neuroticism, which has also been linked to other forms of psychopathology (e.g., Kotov, Gamez, Schmidt, & Watson, 2010; Ormel et al., 2013). Neuroticism is defined as the stable and pervasive propensity towards distress (Watson & Clark, 1984). The findings linking Neuroticism and PTSD have been mixed, and are summarised below.

Consistent with previous research by Parslow, Jorm, and Christensen (2006), Breslau and Schultz (2013) reported that high pre-trauma levels of Neuroticism significantly increased the likelihood of developing PTSD. Their study utilised a prospective approach in which over 1,000 participants were followed up over a 10-year period. Breslau and Schultz found that high scores on a Neuroticism measure increased the relative risk of developing PTSD following a traumatic event. They concluded that the results “confirm the status of neuroticism as a diathesis in the PTSD response to trauma” (p. 1701). They further proposed that this was partly due to the way that high levels of Neuroticism influenced how the event was appraised – a finding that has direct relevance to the current study (Breslau & Schultz).

In contrast, studies by Engelhard and colleagues (Engelhard, van den Hout, & Kindt, 2003; Engelhard, van den Hout, & Lommen, 2009) have concluded that the relationship observed between Neuroticism and PTSD is not necessarily causal. Mediating factors were identified that are common to all psychopathology (Engelhard et al., 2009) and pre-trauma arousal levels
were found to play a significant role (Engelhard et al., 2003). A prospective study conducted by Frazier, Gavian, et al. (2011) showed that the relationship between Neuroticism and PTSD was mediated by unsupportive social interactions. The Breslau and Schultz (2013) study did not perform any statistical analysis of mediating or moderating relationships so it cannot be ruled out that other factors were influencing the observed link between PTSD and Neuroticism.

In the context of these conflicting findings, it is apparent that the role of Neuroticism as a vulnerability factor is not clear-cut, and is likely intertwined with other variables. The role of cognitive factors, such as attributions, in the relationship between Neuroticism and posttraumatic adjustment has been less thoroughly examined, and is explored in the current research.

3.2.2.4 Attachment type. Attachment theory was initially developed in relation to infants and described the impact that their relationship with primary caregivers had on behaviour in subsequent relationships (Bowlby, 1979). A basic principle was the degree to which an infant expressed or repressed their attachment needs (the self) and the level of responsiveness to these needs by the primary caregiver (the other). Bowlby theorised that, based on early experience of the attachment needs and response, the person develops internal working models of themselves and others that shape their perception of the world and others within it.

Similar to personality traits, attachment types have been identified as relatively stable across the lifespan (Main, Kaplan, & Cassidy, 1985). Attachment theory was later extended to include adult attachment types, and has been operationalised in a range of ways, leading to related, but distinct, theories. An extensive discussion of attachment is beyond the scope of the current research, however, two prominent theories in the literature are considered below (Bartholomew & Horowitz, 1991; Hazan & Shaver, 1987).
Hazan and Shaver (1987) explore adult attachment by focusing on patterns observed in romantic relationships, and developed a self-report measure of three attachment types: (1) secure, in which relationships are mostly positive and trusting; (2) avoidant, characterised by a fear of intimacy; and (3) ambivalent, whereby the person is obsessed with the desire for union and reciprocation of affection. Their research shows that attachment types had a predictable impact on the experience of romantic love, and that there is a significant relationship between reported relationships with parents and the reported relationship with the self and others.

Bartholomew and Horowitz, on the other hand, present a four-part model that is based on two dimensions of internal working models regarding how the self is viewed (positive or negative) and how others are viewed (positive or negative). The four categories, as they emerge from these two dimensions, are depicted in Figure 3.1.

<table>
<thead>
<tr>
<th>Model of Self (Dependence)</th>
<th>Model of Others (Avoidance)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Positive (Low)</strong></td>
<td><strong>Negative (High)</strong></td>
</tr>
<tr>
<td>SECURE</td>
<td>PREOCCUPIED</td>
</tr>
<tr>
<td>Comfortable with intimacy and autonomy</td>
<td>Preoccupied with relationships</td>
</tr>
<tr>
<td>DISMISSING</td>
<td>FEARFUL</td>
</tr>
</tbody>
</table>

*Figure 3.1. Model of Adult Attachment (adapted from Bartholomew and Horowitz, 1991).*

The secure and preoccupied categories in this model are conceptually similar to the secure and ambivalent types in Hazan and Shaver’s (1987) theory. The key difference is the division of the avoidant type into dismissing and fearful. Bartholomew and Horowitz (1991) contend
that because previous theories of adult attachment did not fully explore the role of internal working models (i.e., of the self and other) they omit two distinct types of avoidance – one in which people have no desire for closeness with others (dismissing); and another where the desire to be close may exist (due to negative self-image) but there is also a belief that others are not safe (fearful). Findings across two studies validated this model using a range of measures (e.g., interview, self-report, other-report). Bartholomew and Horowitz also linked participants’ reported experiences in family relationships to their attachment type with their peers/friends, which, like Hazan and Shaver’s (1987) study, supported the hypothesis that internal working models established within the family of origin influence adult interpersonal relationships.

Attachment, operationalised and measured in a range of ways (e.g., Bartholomew & Horowitz, 1991; Hazan and Shaver, 1987; Main, Hesse, & Goldwyn, 2008), has been extensively studied across many facets of the psychology discipline (see Cassidy & Shaver, 2008, for a thorough review) and is viewed as one of the most important frameworks for understanding personality (Thompson, 2000). One area that attachment is thought to influence, which is of considerable relevance to the field of trauma, is the regulation of emotion (e.g., Mikulincer, Shaver, & Pereg, 2003; Schore, 2000, Schore, 2002). Both Schore (2000) and Mikulincer et al. characterise attachment as a regulatory theory, in that the infant learns to regulate their stress in relationship with the parent through proximity-seeking behaviour that is either attuned to (secure attachment) or not (insecure attachment).

Schore (2000) further connects attachment to regulatory structures in the brain, particularly the right hemisphere limbic structures contained in the orbitofrontal cortex. Mikulincer et al. (2003) reported that ambivalent/preoccupied insecure attachment is associated with hyper-activated emotional responses (i.e., an escalation of distress), whereas avoidant insecure attachment is more likely to involve the suppression of
emotion (hypo-activation, e.g., thought suppression, avoidance of intimacy, failure to acknowledge negative emotion). With regard to trauma, the neurological response to emotion that has been established by attachment experiences could form a neurologically-based vulnerability to symptoms such as hyperarousal (in the case of ambivalent attachment) or numbing (in the case of avoidant attachment) (Schore, 2002).

It is also proposed that insecure attachment is linked to cognitive processes that affect the response to trauma. A literature review by Mikulincer et al. (2003) looked at attachment, emotion regulation and cognitive processing in response to trauma. They discussed previous findings from Pereg (2001) that had shown a relationship between insecure attachment and an increase in negative cognitions in response to a vignette describing a traumatic event. The negative cognitions were thought to have a moderating effect on emotional arousal. Several studies have investigated the role of attachment type in the response to trauma and the development of PTSD. A selection of these studies is reviewed below.

In a study of women who had experienced intimate partner violence, Scott and Babcock (2010) found that the ambivalent attachment type moderated the relationship between trauma and PTSD symptoms in that an ambivalent attachment type increased the likelihood of PTSD. They also reported that avoidant attachment was significantly related to a lower risk of PTSD. Surprisingly, they did not observe a significant relationship between secure attachment and PTSD. They concluded that consideration of attachment type was useful for determining the risk of developing PTSD for women who had experienced domestic violence.

Elwood and Williams (2007) examined attachment-related cognitions and PTSD symptoms in a sample of victims of interpersonal violence and found a significant positive relationship between PTSD and anxious attachment-related cognitions. They observed that avoidant attachment-related cognitions were markedly less prominent in this sample,
which does not align with the finding of a significant negative relationship in the Scott and Babcock (2010) study. Elwood and Williams noted that PTSD symptomatology, PTSD-related and Attachment-related cognitions, and psychological distress were interrelated, and that anxious attachment mediated the relationship between trauma and depressive symptoms.

In a study that examined cognitions and emotion regulation, in addition to insecure attachment, ambivalent attachment and avoidant attachment types were hypothesised to differ in terms of their relationship to psychological distress (Lilly & Lim, 2013). Ambivalent attachment exhibited a significant positive relationship with depression and posttraumatic stress (in the interpersonal violence sample), whereas avoidant attachment did not. Lilly and Lim also highlighted the significant relationships between ambivalent attachment and other psychological constructs (in this case emotion regulation and cognitions) and recommended that future research investigate these linkages further.

As with Neuroticism, the empirical findings suggest that the role of attachment type as a vulnerability factor for PTSD is complex, and potentially related to other mediating variables such as emotion regulation or event-related cognitions. A measure of both avoidant and ambivalent attachment types was included in the current study to examine its contribution to meaning-making processes.

3.2.2.5 Previous traumatic events. The relationship between previous traumatic experiences and the risk of PTSD has been comprehensively researched. In a meta-analysis of risk factors Ozer, Best, Lipsey, and Weiss, (2008) established that prior traumatic experience conferred a small, but significant, risk for developing PTSD following subsequent traumatic events. This was particularly so when the previous trauma involved interpersonal violence (Ozer et al.).

In a prospective study of the relationship between prior traumatic events and PTSD using a community sample, Breslau, Peterson, and Schultz
(2008) found a significantly greater risk of developing PTSD for participants who reported previous traumatisation. On further analysis, they determined that this risk remained significant only when the person had developed PTSD following the prior trauma. Breslau et al. suggested that there might be common causal mechanisms underpinning PTSD in both cases, rather than a direct relationship between PTSD and prior traumatic experiences.

One perspective on the reason why previous experience of traumatic events may increase the risk of PTSD following a subsequent event is the labelled the sensitisation hypothesis (Resnick, Yehuda, Pittman, & Foy, 1995), which proposes that the previous experience of trauma sensitises the person to developing PTSD. This could be due to the subsequent traumatic event re-enforcing a previous conditioned response (referred to as the inflation effect; Rescorla, 1974). It could also be related to the possibility that trauma sensitises the system to shock, whereby a conditioned fear response is established more readily (Rau, DeCola, & Fanselow, 2005).

A further possibility is that previous trauma impacts on the perception of levels of threat in the environment. As emphasised in Ehlers & Clark’s (2000) theory of PTSD, a maintained sense of current threat is a key feature of PTSD. Regambal and Alden (2012) conducted a prospective study where they investigated whether a heightened sense of threat, influenced responses to a stressful event (a video which depicted a car accident). They found that participants who demonstrated high pre-existing evaluations of threat processed the stressful event differently to those that did not. They also showed greater evidence of PTSD-like symptoms (re-experiencing symptoms and negative responses to intrusions) when assessed a week after initial exposure. Regambal and Alden concluded that perceptions of threat are a possible pre-existing vulnerability factor for PTSD that could help explain how past traumatic events impact the development of PTSD.
3.2.2.6 Methodological issues in the study of pre-trauma vulnerabilities. Several important methodological issues hinder the elucidation of pre-existing vulnerabilities to PTSD. Perhaps most significant is the difficulty in assessing pre-trauma functioning using cross-sectional or correlational designs (e.g., Pitman et al., 2012; Reijneveld et al., 2003). This is particularly the case with cognitive, personality and attachment variables, which can be impacted by the traumatic event itself. Measurement of these variables also requires accurate self-report (unlike biological factors, for example) which is a perennial issue when studying psychological constructs.

A further concern is the difficulty of disentangling relationships between multiple variables to isolate causal mechanisms. Most of the vulnerabilities reviewed in this section exhibit a relationship with PTSD symptoms, however, closer examination reveals more complex patterns with regard to causality. It is likely that several of the identified vulnerabilities for PTSD are mediated by common factors which also cut across other forms of psychopathology, such as anxiety or mood disorders (e.g., Breslau et al., 2008; Engelhard et al., 2009). Teasing out this network of relationships and the chain of causality is also constrained by cross-sectional methodology.

The literature does contain examples of prospective studies (e.g., Breslau et al., 2008; Breslau & Schultz, 2012; Bryant & Guthrie, 2007; Frazier, Gavian et al., 2011; Parslow et al., 2006; Yuan et al., 2011). The samples used for these studies are frequently limited to a particular population, however, such as military personnel or emergency services workers, who are known to be at greater risk for experiencing a traumatic event. Prospective studies have also been conducted with community samples (e.g., Parslow et al.) and undergraduate student samples (e.g., Frazier, Gavian et al.), although, understandably, these have only investigated a limited range of variables. Given that meta-analyses of the
PTSD literature have established that the type of event is a separate risk factor (i.e., some events are more closely linked to PTSD than others; e.g., Breslau et al., 1998; Hetzel-Riggin & Roby, 2013) it cannot be assumed that vulnerabilities detected with one population apply equally across all other populations and events.

The complexity inherent in this area of study is returned to in Chapter Four in the context of the current study. In the next section, peri- and posttraumatic risk factors for PTSD are outlined. These are somewhat easier to study, given that they occur during and after the event itself, and have been found to have greater predictive capability for PTSD (Brewin, Andrews, & Valentine, 2000; Ozer et al., 2008). Following the discussion of these risk factors, variables linked to resilience following trauma are also described.

3.2.2.7 Other relevant risk factors. Significant research attention has also been focused on risk factors that occur during (peritraumatic variables) and after (posttraumatic variables) the traumatic event (see Brewin, et al., 2000; Ozer et al., 2008 for reviews). These risk factors are less relevant to the current research, which focuses on responses to an imagined traumatic event, and so are only briefly described.

Ozer et al. (2008) found that peritraumatic dissociation exhibited the highest effect size of all the risk factors included in their meta-analysis. Ozer et al. also examined self-reported peritraumatic emotional responses (defined as intense negative affect during or immediately after the event) and found a moderate effect size, which was significant despite a relatively small number of studies measuring this variable.

In addition to several pre-trauma variables already described (see Sections 3.2.2.1-5), Brewin et al.’s (2000) meta-analysis highlighted the impact of demographic variables, trauma severity, posttrauma social support, and subsequent life stress. They concluded that lack of social support following the traumatic event, event severity and subsequent life
stress had the biggest impact on PTSD. Demographic variables such as female gender, younger age at the time of the event, minority race status, and greater social disadvantage (i.e., low SES and education) also exhibited significant effects.

In a recent and comprehensive study of the role of female gender in the development of PTSD Hetzel-Riggin and Roby (2013) found that women were significantly more likely than men to develop PTSD in the wake of traumatic events, particularly following interpersonal violence. The authors proposed that this was partially due to an increased risk of peritraumatic dissociation in women. They also suggested, however, that the men and women in their sample “often perceive[d] events differently” (Hetzel-Riggin & Roby, p. 50). They did not further elaborate on this statement, but it is possible that this reflects differences in meaning-making processes following trauma. The current study includes the analysis of gender, alongside other demographic variables such as age and ethnicity.

3.2.3 Resilience factors. Thus far, this section of the literature review has focused on pathological responses to traumatic events and vulnerability for these outcomes. Bonanno and colleagues (e.g., Bonanno, 2004; Bonanno & Mancini, 2012; Bonanno, Westphal, & Mancini, 2011) have argued that, while understanding disorders such as PTSD are undoubtedly important, two critical areas have been overlooked by researchers: 1) The protective factors that contribute to resilience; and 2) The heterogeneity of responses across time, situations and individuals. A distinction offered by Bonanno’s research is the focus on potential traumatic events – that is, to look at people’s responses to events that have the capacity to cause PTSD, rather than just the individuals who develop psychopathology.

Resilience following traumatic events has also been considered by theories of posttraumatic growth (PTG), although it is important to recognise that these terms are not interchangeable and represent related, but
distinct, constructs. The term *posttraumatic growth* refers to the possibility of developing a stronger and more resilient sense of self in response to stressful or traumatic events. These theories (see Affleck & Tennen, 1996, for a review) highlight the observation that some cognitive appraisals lead to the identification of benefits and opportunities for positive changes. For example, a person who survives a life-threatening accident may learn to value their family more highly and decide to devote more time to their children. From an individual perspective, surviving a traumatic event could lead to increased beliefs regarding self-efficacy or personal courage (Affleck & Tennen). Posttraumatic Growth is thought to co-exist with other posttraumatic responses – it is not a case of someone demonstrating PTSD or PTG (Joseph & Linley, 2005). A person may experience significant distress, however also be able to identify some ways in which they have grown personally from the event, such as through greater self-knowledge or an enhanced connection with spirituality (Joseph & Linley, 2005).

A recent meta-analysis of the factors contributing to PTG found that the largest effect sizes were found for religious coping and positive reappraisal coping (i.e., finding benefits; Prati & Pietrantoni, 2009). Moderate effect sizes were identified for factors relating to social support, dispositional optimism and spirituality. The smallest effect size was observed for acceptance coping (i.e., accepting that some uncontrollable situations cannot be altered; Prati & Pietrantoni).

Studies of resilience have also emphasised the centrality of coping strategies, although the focus has been on concepts such as perceived coping self-efficacy (i.e., beliefs about the self as a “good cope-er”; Benight & Bandura, 2004) and coping flexibility (i.e., the ability to use different coping styles according to the situation; Galatzer-Levy, Burton, & Bonanno, 2012). Interestingly, some attributes thought to be maladaptive, such as repressive coping (suppressing thoughts and feelings about the event) and
unrealistic positive self-esteem, may actually be assets in the face of potentially traumatic events (Bonanno, 2004).

Of particular relevance to the current study, personality traits are also thought to play a role in resilience and PTG. As mentioned above, Prati and Petrantoni’s (2009) meta-analysis identified dispositional optimism as an important predictor of PTG. This trait was also significantly related to PTG in a study of U.S. and Japanese students (Shigemoto & Poyrazli, 2011). Bonanno (2004) highlighted a number of individual qualities that contributed to resilience: “hardiness”; trait self-enhancement, or the existence of overly positive biases in self-esteem; and dispositional tendencies towards positive emotion and laughter (i.e., Extraversion). Based on these findings, measures of both Extraversion and dispositional optimism were included in the current study.

3.2.4 Summary. This section has summarised a theoretical model of PTSD, as well as research into vulnerability, risk and resilience factors for psychopathology following traumatic events. First, the Ehlers-Clark cognitive model was presented as a theoretical foundation for understanding how cognitive processes maintain symptoms of PTSD (Ehlers & Clark, 2000). Second, vulnerabilities for psychopathology identified in the literature were examined. It was proposed that these pre-existing variables form the diathesis that can interact with the stress of the traumatic event to produce psychological distress. Additional risk factors, such as peritraumatic experiences, demographic variables and posttrauma social support, were briefly presented. To counterbalance the depiction of psychopathology in response to trauma, this section finished with a discussion of resilience and posttraumatic growth.

The findings presented in this section point towards a complex interaction between multiple variables in determining how an individual responds to a traumatic event. In the context of such complexity, it is necessary to focus on a particular area, although this unavoidably involves
neglecting other influential domains. Building from the understanding of causal meaning-making and behavioural explanations described in Chapter Two, and the function of lay perceptions of these processes, the current study focuses on pre-existing attributional styles.

In the next section, the link between attributional style and trauma is further explored. This culminates in the presentation of a specific theoretical model: the Temporal Model of Perceived Control (TMPC; Frazier, Berman, & Steward, 2002). This model is utilised in the current study to conceptualise responses to an imagined traumatic event.

3.3 Meaning-making and post-traumatic adjustment: theoretical models.

As with previous sections of the literature review, prior to discussing empirical findings, a theoretical model of how meaning-making processes impact post-traumatic adjustment is presented. In section 3.2.1.1 the Ehlers-Clark model of PTSD was presented, which emphasised the critical role of negative appraisals in maintaining PTSD. In this section, theory relating to this aspect of cognitive functioning is further explored. First, Janoff-Bulman’s (1992) influential theory of “shattered assumptions” is presented as an account of how the disruption of deeply held beliefs can cause posttraumatic distress. Second, meaning-making processes are highlighted in Park and Folkman’s (1997) distinction between local and global levels of meaning.

3.3.1 Janoff-Bulman’s theory of shattered assumptions. Janoff-Bulman’s (1992) theory of the development of PTSD is based on two critical features of an individual’s cognitive system: (1) the development of internal working models, also referred to as “assumptions”; and (2) the essential conservatism of this system, characterised by a drive towards cognitive consistency and maintaining the status quo. Janoff-Bulman proposed that, in a manner similar to the development of attachment types, people form internal working models in their early life regarding
themselves, the world, and the people within it. These assumptions are underpinned by concepts of meaningfulness (i.e., things happen for a reason), benevolence, security, trust and invulnerability. As with the drive towards meaning-making, seeing the world in this way fosters coherence. This, in turn, promotes learning, exploration and personal growth. Janoff-Bulman described three core assumptions: (1) the world is benevolent; (2) the world is meaningful; and (3) the self is worthy.

The drive to maintain internal consistency means that our underlying beliefs and assumptions colour our perception of events. Meaning-making processes can be characterised as an interaction between pre-existing ideas and new information, rather than a linear progression of stand-alone interpretations. Janoff-Bulman (1992) refers to the Piagetian concepts of assimilation and accommodation to describe the relationship between assumptions and real-world data: if the data are close enough to the assumption it is assimilated; if they are sufficiently different, a process of accommodation must occur where the assumption itself is altered.

People exhibit a bias towards assimilation over accommodation; however, this is challenged in the wake of traumatic events (Janoff-Bulman, 1992). The intense emotional arousal experienced during a traumatic event disrupts normal cognitive functioning and, if sufficiently intense, “shatters” the core assumptions. It is theorised that an individual struggles to maintain a belief in the world as benevolent and meaningful, or the self as worthy, in the face of deeply painful and overwhelming events, such as rape, war or natural disasters (Janoff-Bulman). The disruption of these key organising principles causes significant distress as coherence and stability, which are so central to wellbeing, are no longer functioning.

Within this model, individual differences in response to trauma are driven by the extent to which the core beliefs are shattered and the speed with which a restoration of meaningfulness, benevolence and self-worth can occur. Janoff-Bulman (1992) acknowledged that, at first glance, her theory
may appear to predict that those people in whom the core assumptions are most deeply established are most at risk of PTSD. Following this line of reasoning, individuals who are less identified with the core assumptions may fare better as the world is already seen as less meaningful or benevolent, and the self as less worthy. As with many other aspects of traumatic recovery, however, this initial impression becomes more intricate upon further examination, due to the ways in which assumptions are intertwined with other attributes.

According to Janoff-Bulman (1992), although the initial impact of the trauma may be more distressing for individuals who deeply ascribe to the core assumptions, strongly held assumptions are also likely related to resilience factors. This is because assumptions are established in the context of positive early life experiences. The development of core assumptions is strongly associated with the formation of attachment and identity – beliefs that the world is meaningful and benevolent and the self is worthy are fostered in the context of positive early relationships (i.e., a secure attachment relationship). Secure attachment has been linked to a range of resilience factors, including: better emotion regulation (e.g., Karreman, 2012; Thompson & Meyer, 2007); more positive self-representations (e.g., Goodvin, Meyer, Thompson, & Hayes, 2008); increased self-efficacy in problem-solving (Wei, Heppner, & Mallinckrodt, 2003); higher Extraversion and Openness and lower Neuroticism (e.g., Hagekull & Bohlin, 2003); and better interpersonal relationships (e.g., Feeney, 2008). These attributes have been identified as protective factors against PTSD; therefore, the environment that cultivates the core assumptions may also promote the development of other personal resources that assist the recovery process.

As established in the earlier discussion of vulnerabilities for PTSD, the relationship between pre-existing attributes and posttraumatic recovery is complicated and heterogeneous. The role of meaning-making styles in
this process is also relevant. It is possible that connections between pre-existing vulnerability and posttraumatic responses are strongly influenced by the explanations people form about why the event happened. Research surrounding these connections is presented in Section 3.3, however before this, Park and Folkman’s (1997) theory of the meaning-making process is summarised.

3.3.2 Park and Folkman’s theory of global meaning and situational meaning. Consistent with many other theories of recovery, Park and Folkman (1997) begin with the premise that the traumatic events are a catalyst for meaning-making processes. They outlined a model depicting two levels of meaning: global meaning and situational meaning (see also Park, 2010, for a review of this model in light of recent empirical findings). Global meaning encompasses the person’s fundamental and enduring assumptions, beliefs and expectations about the world (Park & Folkman, 1997). This is consistent with the core assumptions described by Janoff-Bulman (1992). Situational meaning is a product of the relationship between a person’s global meaning and the person-environment interaction (Park & Folkman).

According to this theory, both positive and negative life events trigger the cognitive appraisal process and the assignation of situational meaning, which is then compared with global meaning (Park & Folkman, 1997). Where there is congruence between the situational meaning and global meaning the event is assimilated within pre-existing belief structures and perceived as non-stressful. Traumatic events, however, frequently exhibit significant incongruence with global meaning. This generates stress and triggers a person’s coping processes. The individual is motivated to resolve the incongruence by making changes to either the situational meaning of the event, through reappraisal, or their global meaning structure. These efforts are referred to as the meaning-making process (Park, 2010). The resolution of this process is referred to as meanings made and this
includes concepts such as a sense of having “made sense” of the event, acceptance, causal understandings (why did the event happen), and finding benefits from the event (Park, 2010). The term “meanings made” is utilised in the remainder of this thesis to denote the outcome of meaning making processes.

3.3.3 Summary. Both Janoff-Bulman’s (1992) and Park and Folkman’s (1997) theories highlighted internal working models, or global meaning structures, that can be disrupted by traumatic events. This causes distress and stimulates the meaning-making process, leading to “meanings made”. Given the importance of uncovering individual differences in traumatic responses, the next section examines the idea that some “meanings made” following traumatic events are more adaptive than others. This involves a review of empirical studies of meaning-making following trauma, culminating in the presentation of the Temporal Model of Perceived Control.

3.4 Meaning-making and post-traumatic adjustment: empirical findings.

This section, which discusses the findings of empirical work into the link between causal meaning-making and posttraumatic adjustment, is divided into three parts. First, studies looking at different forms of self-blame following traumatic events are reviewed. Second, the role of perceived control in posttraumatic recovery is discussed, alongside the description of the Temporal Model of Perceived Control. Third, empirical findings relating to this model are presented.

3.4.1 Self-blame and posttraumatic adjustment. Early investigations into the link between attributional processes and posttraumatic adjustment were conducted by Janoff-Bulman (1979), who made a distinction between behavioural self-blame attributions and characterological self-blame attributions. In terms of the attributional dimensions described in Section 2.3.3, both are internal to the person, but
differ in terms of controllability and globality. Behavioural explanations tend to be controllable and specific to particular situations, whereas characterological explanations are uncontrollable and global in their impact.

Behavioural self-blame was conceptualised as control-related and focused on behavioural causes for the event that were more transient and context-bound (Janoff-Bulman, 1979). Characterological self-blame was esteem-related and emphasised personality attributes which, by their nature, are long-standing and pervasive (Janoff-Bulman). For example, following an event in which a person is robbed while walking to their car after a night out, some might attribute cause to a belief that the perpetrator identified them as weak (characterological self-blame), whereas others may attribute cause to walking alone at night (behavioural self-blame).

In addition to describing these two types of self-blame, Janoff-Bulman (1979) also hypothesised that they would be differentially related to posttraumatic adjustment, with characterological self-blame more strongly related to increased post-traumatic distress. In a study conducted with a college sample, participants who scored higher on depression reported greater use of characterological self-blame, had less belief in personal control, and assigned a greater role to chance (Janoff-Bulman, 1979). In a study using a rape crisis centre sample, also reported in her 1979 paper, behavioural self-blame emerged as the most common attribution strategy. Janoff-Bulman concluded that behavioural self-blame was more adaptive because it maintained a belief in personal control, whereas characterological self-blame focused more on attributes outside the individual’s control. This type of meaning led to ongoing distress, as it did not restore a sense of personal safety.

Since Janoff-Bulman’s research, numerous researchers have sought to further elucidate the link between meanings made and psychological adjustment. A study by Meyer and Taylor (1986) was one of the first attempts to test Janoff-Bulman’s hypothesis that behavioural self-blame
would be associated with better adjustment following traumatic events. Meyer and Taylor investigated the relationships between rape victims’ reactions, causal attributions, coping behaviours, and psychological adjustment. They found that both behavioural and characterological self-blame were associated with poorer adjustment. Meyer and Taylor concluded that, while attributions involving self-blame were common, “no form of self-blame was an adaptive response to rape” (p. 1232). In the context of attribution theory, this may be because all forms of self-blame are internally focused, which tends to be linked to greater distress (e.g., Elwood et al., 2009).

Subsequent studies have also produced mixed results regarding the link between self-blame and posttraumatic adjustment. For example, Frazier (1990) investigated the relationship between characterological, behavioural and external attributions and psychological adjustment in rape victims three days after the crime. She found that while many engaged in some self-blame, most victims attributed blame for the rape to external factors (e.g., the offender). Consistent with Meyer and Taylor (1986) Frazier also found that both forms of self-blame, characterological and behavioural, were associated with higher levels of depression. It is worth noting that participants in this study were in the early stages of recovery (less than a week after the event occurred); thus these findings may not generalise to the longer-term recovery process.

In a more recent study of sexual assault victims, Breitenbecher (2006) detected a significant positive relationship between characterological self-blame and posttraumatic distress, although not with behavioural self-blame and distress. Additionally, Breitenbecher reported that behavioural self-blame predicted perceived avoidability of future victimisation, and that participants made attributions to societal, perpetrator and chance/luck factors in addition to self-blame.
Behavioural self-blame was also identified as an adaptive response to criminal victimisation in a study by Winkel, Denkers, and Vrij (1994). Using a sample of participants who had experienced a burglary, Winkel et al. established that behavioural attributions resulted in better psychological adjustment following the event, whereas characterological attributions appeared to generate learned helplessness responses, similar to those described in section 2.3.3. These findings were consistent with Janoff-Bulman’s (1979) theory, although it is worth considering the differences in the nature of a burglary and a sexual assault. Burglary does not involve interpersonal violence, and thus may be less prone to characterological attributions. It is possible that the nature and severity of the crime is a further factor impacting on the relationship between attribution and adjustment (MacLeod, 1999).

Taken together from these studies, the findings suggest that conceptualising the relationship between meanings made and distress as a simple distinction between behavioural and characterological self-blame is problematic. This is reflected in Littleton, Magee, and Axsom’s (2007) meta-analysis of self-attribution following three types of trauma (sexual victimisation, illness and injury). They found that self-blame was a somewhat infrequent and often temporary response to victimising events. As demonstrated in several studies (e.g., Breitenbrecher, 2006; Frazier, 1990) people also engage in attributions involving external factors such as the perpetrator, luck or chance, or societal values. Littleton et al. concluded that extant theoretical models did not adequately explain the patterns of findings across studies and suggested that future research investigate the role of: perceived control over future victimisation or the consequences of trauma; features of the traumatic event itself; and the influence of perceptions of positive or negative consequences. A common thread within Littleton et al.’s recommendations is the significance of perceptions, that is,
the subjective experience of the individual, in shaping the meanings made. Pre-existing attributes undoubtedly play a role in forming these perceptions. Subsequent studies have sought to ascertain possible mediating variables between self-blame appraisals and posttraumatic distress, including negative social reactions (Hassija & Gray, 2012), previous history of childhood betrayal (Babcock & DePrince, 2012), and the relationship with emotions such as guilt and shame (Tilghman-Osborne, Cole, Felton, & Ciesla, 2008). Although this research illuminates the possible relationships between variables, it does not necessarily provide a unified theoretical model of why these factors are causally interrelated.

In an attempt to draw together contrasting findings regarding trauma, meaning-making, and psychological adjustment, Frazier, Berman, and Steward (2001) developed the Temporal Model of Perceived Control (TMPC). This theory proposed that meaning-making following trauma is linked to regaining a sense of control, and that the temporal orientation (i.e., past, present, or future) of these efforts is critical in shaping posttraumatic adjustment. These concepts and the empirical support for this model are explored in the next section.

3.4.2 Meaning, perceived control and temporal orientation. Before outlining the elements of the temporal model of perceived control, it is necessary to examine the function of control in shaping responses to trauma. Therefore, this section begins with a brief discussion of findings from animal studies of trauma responses. This is followed by a description of the role of temporal orientation, which then leads to an overview of the TMPC, which integrates these two constructs. Empirical support for this model is presented in Section 3.4.3.

3.4.2.1 The role of control in trauma response. In their review of findings from animal studies, Foa et al. (1992) found that behaviours equivalent to PTSD symptoms in adults (i.e., disturbed functioning and generalised fear, fear conditioned to a discrete stimulus, analgesia and
avoidance) emerge in animals as a function of the uncontrollability and unpredictability of the aversive event. They further emphasised the importance of perceptions of control, as opposed to objective assessments of controllability. Foa et al. argued that the findings from these studies, in which strictly controlled experimental methodologies were employed, provided a valuable insight into the causal mechanisms of post-traumatic responses.

More recent studies of mice have reinforced the critical role of the controllability of fear-inducing stimuli. Liu, Tang, and Sanford (2009) found that mice who received an inescapable shock displayed “behavioural freezing” (a behavioural marker of fear) more frequently than mice who received the escapable shock (the controllable stress condition). Neurological examination following the experiment showed increased activation across several brain structures (e.g., the amygdala, the hypothalamic paraventricular nucleus [PVN]) for those in the inescapable shock group, whereas a significantly more limited pattern of structural brain changes was observed in the escapable shock group. This led Liu et al. to conclude that controllability significantly impacted on behavioural responses to fearful stimuli, and that this had an observable impact on brain structure. A concurrent study focusing on sleep patterns also found that the controllability of the aversive event impacted the amount of REM sleep in mice who received the uncontrollable shock (Sanford, Yang, Wellman, Liu, & Tang, 2010), which produced sleep disturbance analogous to that observed in people diagnosed with PTSD.

Control is also a central concept in several of the attribution theories presented in Chapter Two. For example, research discussed by Kelley and Michela (1980; Section 2.3.1) suggests that the motivation to make internal attributions stems from the need to retain a sense of personal control. This was true even in the wake of negative events; the “just world hypothesis” (Lerner & Miller, 1978) proposed that trusting that individual behaviour
influenced the event maintains a sense that the world is safe and the self is efficacious.

These beliefs are also highlighted as core assumptions in Janoff-Bulman’s (1992) theory. Another example is the theory of learned helplessness, in which the symptoms of depression are theoretically linked to the experience of a non-contingency between action and outcome; that is, a lack of power or control over events (Miller & Seligman, 1975). From an attributional perspective, individuals who exhibited signs of learned helplessness were more likely to employ global, internal and stable attributions for events (Abramson et al., 1978). It is possible that similar causal mechanisms between lack of control and pathology operate across depression and PTSD (Bargai, Ben-Shakhar, & Shalev, 2007; McKeever, McWhirter, & Huff, 2006).

3.4.2.2 Perceived control and the role of temporal orientation.

While perceived control appears an important part of understanding posttrauma reactions, the construct of control is wide-ranging and can be difficult to define (Skinner, 1996). In her review, Skinner proposed that the many control-related concepts presented in the literature could be understood within a framework of: **agents** (who is exerting the control); **means** (the actions, beliefs or attributions within the individual’s repertoire); and **ends** (the consequences and outcomes of the agent-means interaction, which includes feelings of distress or wellbeing). With regard to the literature presented in the current Chapter, the “agent” relates to the individual differences people have prior to the traumatic event (see section 3.1.2), the “means” include the meaning-making processes (section 3.2), and the “ends” are distress levels.

When formulating their theory linking meaning-making, perceived control and post-traumatic adjustment, Frazier et al. (2001) emphasised an agent-related aspect of control: the temporal dimension. This represented a departure from the attributional orientations discussed in Chapter One of
this review and towards a concept described by Zimbardo and Boyd (1999) as placing an important filter on cognitive processes. Zimbardo and Boyd argued that people exhibit individual differences in their tendency to approach problems from either a past, present or future temporal perspective. Habitual use of one temporal orientation over another generated a cognitive bias that shaped subsequent processes, including meaning-making.

Frazier et al. (2001) linked temporal orientation with perceived control and proposed that people make sense of traumatic events through the use of one of three strategies: (1) past control (“What could I have done to prevent the event from occurring?”); (2) present control (“What can I control now to stop this event affecting me?”); or (3) future control (“What can I do in the future to prevent the event from happening again?”). To support their argument Frazier et al. cited Holman and Silver’s (1998) longitudinal study with victims of childhood incest, combat veterans, and survivors of a natural disaster. Consistent with Zimbardo and Boyd (1999), Holman and Silver stated that temporal orientation creates “an overarching cognitive response bias that filters and interprets the meaning of personal experience” (p. 1146).

On the whole, Holman and Silver’s (1998) findings indicate that a past temporal orientation makes a unique, significant contribution to increased long-term distress in trauma victims. Future temporal orientation, on the other hand, appeared to have a protective impact. Results regarding the present temporal orientation were mixed: in the incest sample a present orientation was negatively associated with distress, whereas in the natural disaster sample a positive relationship with distress was observed. Holman and Silver proposed that this could be due to the amount of time since the event (several years, if not decades, in the incest sample and six months in the natural disaster sample); present control may be less adaptive in the
To provide a rationale for why some temporal orientations were more adaptive than others, Frazier et al. (2001) argued that present and future orientations involved focusing on elements that the individual could conceivably exert influence over, whereas a past orientation highlighted events that had already occurred, and thus were not realistically able to be controlled. In addition, they linked the effectiveness of past control strategies with the objective controllability of the event. Past control beliefs may be adaptive when the event was objectively controllable, they are less helpful, however, in the face of uncontrollable trauma.

Present-oriented strategies include control efforts concentrated on the recovery process, including coping with symptoms of anxiety and depression. Frazier et al. (2001) proposed that present control was the most adaptive response to meaning-making after traumatic events. It was conceptually associated with constructs such as coping self-efficacy (Benight & Bandura, 2004) and perceived control of internal states (Pallant, 2000), both of which have been linked to decreased distress following trauma.

Future control emerged as a slightly more complicated construct. In later studies (e.g., Frazier 2003; Frazier et al., 2004) it was redefined into two constructs: perceived control over the occurrence of subsequent events and perceptions of the likelihood of future events. Initially, both forms of future orientation were hypothesised to be positively related to adjustment; in later studies (e.g., Frazier, Keenan et al., 2011) the objective controllability of the event was highlighted as influencing the adaptiveness of future control. If the event was objectively controllable, such as a university exam, then future control was adaptive. For more unpredictable events, such as criminal victimisation, future control was positively associated with distress.
3.4.3  **Empirical support for the temporal model of perceived control.** The central hypothesis of the TMPC is that the temporal orientation of an individual’s control-related cognitions following a traumatic event is differentially linked to posttraumatic adjustment. People who make sense of the event by focusing on what could have been done to prevent it (past control) are thought to fare worse than those who focus on managing their current symptoms (present control) or how they can prevent a reoccurrence (future control). This section presents early research regarding the linkages between temporal orientations and adjustment. This is followed by investigations into the connection between temporal orientations and other important variables. Finally, recent studies that incorporated a new measure of the TMPC and further tested the relationship between control orientation and outcome are discussed.

3.4.3.1  **Empirical studies of the relationship between temporal orientations and distress.** In one of the earliest investigations of the TMPC, Frazier (2003) conducted a longitudinal study with survivors of sexual assault. This study investigated the relationships between distress (measured using the Depression, Anxiety and Hostility subscales of the Brief Symptom Inventory) and five types of control beliefs: behavioural self-blame (personal past control); rapist blame (vicarious past control); control over recovery (present control); future control; and future (un)likelihood. The control beliefs were measured using a *Rape Attribution Questionnaire* developed specifically for the research.

The results of Frazier (2003) indicated that past control strategies were significantly correlated with increased distress, whereas control over recovery and beliefs about future likelihood were significantly correlated with reduced distress. Future control beliefs and distress levels did not exhibit a significant correlation. In regression analysis, the control beliefs explained a significant portion of the variance in distress ($R^2$s = .33 to .41 across four timepoints), however, only present control and past control were
statistically significant predictors. Analysis of change over time revealed that decreased distress was related to an increase in the use of present control beliefs and a reduction in past control strategies. The temporal orientations of control were weakly to moderately correlated – the strongest relationship was between present control and future control ($r_s = .35$ to $.46$ across four timepoints).

Frazier (2003) interpreted the findings as supporting her hypotheses that past control beliefs are associated with increased distress and that present control strategies were the most adaptive. The findings regarding future control were less conclusive. Several questions regarding the TMPC remained, such as the replicability of the results with different populations and the further refinement of the measurement model for the temporal orientations. The future control construct was also not clearly related to distress, and thus warranted further investigation.

Frazier et al. (2004) sought to further establish the link between temporal orientations of perceived control and posttraumatic adjustment via a cross-sectional study across two types of traumatic event (sexual assault and sudden bereavement). Other possible mediating variables, such as Neuroticism and the number of past year stressors, were also included in the analysis. Consistent with the theoretical model and the findings of Frazier (2003), present control was significantly related to wellbeing in both samples, even after controlling for other variables. In partial support of the TMPC, future control was linked to better adjustment in the sexual assault sample, but not the bereavement sample. Against expectations, the past control orientation was not significantly related to adjustment. Frazier et al. contended that the measurement of past control may have been problematic, and that further research was required to better understand the conflicting results.

3.4.3.2 Linkage between temporal orientations, coping strategies and positive life changes. Additional studies with survivors of sexual assault
have also investigated the mediating role of coping strategies on control beliefs (Frazier et al., 2005) and of control beliefs on finding positive life changes (Frazier et al., 2004). As with previous studies, the present control orientation was found to significantly enhance posttraumatic adjustment, with coping strategies such as less social withdrawal and more cognitive restructuring also playing a mediating role (Frazier et al., 2005). Present control beliefs were also linked to a greater likelihood of identifying positive life changes (Frazier et al., 2004).

Past control beliefs, operationalised as behavioural self-blame in both studies, exhibited the opposite pattern of results. They were associated with increased use of social withdrawal coping strategies and a decreased likelihood of finding positive life changes (Frazier et al., 2004; Frazier et al., 2005). Future control beliefs, operationalised as a measure of “taking precautions” to prevent further assaults, were unrelated to finding early positive life changes, however they did increase the likelihood of reporting positive life changes over a longer time period (Frazier et al., 2004). Future control was not included in the study of coping strategies.

3.4.3.3 Scale development and measurement of outcomes and relationships with other variables. The findings of Frazier and colleagues’ research have deepened the understanding of how control beliefs may interact with other important variables in the aftermath of sexual assault, however several issues remained. These included: limited diversity of the sample populations, both demographically and with regard to the type of traumatic event; the absence of a psychometrically sound measure of the TMPC; and the inconsistent results with regard to past and future control. These concerns were addressed in a comprehensive series of studies reported by Frazier, Keenan et al. (2011). Using four samples of undergraduate students \( (N = 1,421) \), Frazier, Keenan et al. developed a measure of the TMPC, examined the differences between perceived control beliefs and other theoretically related constructs (general control beliefs,
coping), and tested the relationships between the temporal orientations and adjustment.

Prior to exploring the relationship between perceived control beliefs and other variables, Frazier, Keenan et al. (2011) reported on the development of the measure of the TMPC: the Perceived Control Over Stressful Events Scale (PCOSS). An exploratory factor analysis was conducted with the 18-item measure, followed by a confirmatory factor analysis. These analyses supported the three-factor structure of the model, with the deletion of one of the future control subscale items (leaving 17 items in total).

Reliability of the measure was established through inspection of the alpha coefficients (all .77 or above) and test-retest correlations of between \( r = .48 \) (present control) and \( r = .80 \) (past control). Convergent validity was determined for the past and present control subscales, however the future control subscale did not correlate as expected with measures of optimism or hope. Discriminant validity was also established for all three subscales (although present control did exhibit a moderate positive correlation with emotional stability). Although there were some issues with measure, such as the relatively low test-retest reliability for the present control subscale and the absence of convergent validity for the future control subscale, Frazier, Keenan et al. (2011) determined that the results were adequate to justify using the measure in subsequent analysis.

Analysis of the link between temporal orientations and adjustment was based on event-related and general distress reported by participants. It was hypothesised that present control would exhibit the strongest (negative) relationship with distress and that past control would be positively related with distress. Future control was predicted to be positively related to distress in the stressful events condition but negatively associated with distress in the controllable event condition (the final exam). This hypothesis
incorporated a further refinement of the theory – that the adaptiveness of future control was linked to the event’s objective controllability.

The regression analyses supported the predicted link between present control and distress. Past and future control had small but significant positive relationships with event-specific and general distress in sample 3, but not in the other samples. Interestingly, it was sample 3 that utilised a measure of traumatic events, rather than asking for participants to select an event that was “stressful” or “upsetting”. It was likely that the events focussed on in sample 3 were more severe than those used in samples 1 and 2, which may have impacted the results. For sample 4, the final exam condition, future control was significantly related to more confidence and motivation regarding the exam \( (r = .43, p < .001) \) and performance on the exam itself \( (r = .15, p < .001) \). As predicted, the objective controllability of the event appeared to enhance the adaptiveness of future control beliefs.

In the third analysis, Frazier Keenan et al. (2011) looked at whether event-specific control beliefs uniquely influenced outcomes beyond that predicted by general control beliefs (i.e., self-efficacy, mastery, and realistic control). As hypothesised, including specific event-related control beliefs (measured using the PCOSS), significantly improved the amount of variance in general and event-specific distress explained by the regression model. The model including the temporal orientations explained significantly more variance than the model with general control beliefs only. Consistent with the hypothesis and the findings of previous studies, present control was associated with the largest amount of variance explained (standardised beta weight = -.19 to -.41 across Samples 1 and 2).

A final analysis investigated the relationship between perceived control, particularly present control, and coping strategies. The primary hypothesis was that regression models inclusive of perceived control strategies would explain significantly more variance than those that contained coping strategies alone. This hypothesis was supported, again
with present control the largest contributor to variance explained of the perceived control beliefs.

A key feature of these studies is that the TMPC moved from being solely applied to traumatic events and was tested as a response to stressful life events (such as academic stress). Participants were asked to focus on a past or ongoing event that was stressful (sample 2) or upsetting (sample 1). For these samples, the most common events were interpersonal loss or conflict, bereavement, or education or work difficulties. Sample 3 completed the traumatic life events questionnaire where the most common event was a loved one experiencing life-threatening accident, assault, or illness. Sample 4 were asked to respond according to the upcoming final exam.

The diverse range of events people responded to, and also the fact that they were stressful events rather than trauma, represents a notable departure from previous studies into trauma, meaning-making and adjustment. The impact of event-type or the severity of the trauma on meaning-making has not been explored in relation to the TMPC, however research into PTSD has suggested that the type of traumatic event does play a role in levels of distress, particularly following the event. For example, a study by Amstadter and Vernon (2008) examined peri- and post-traumatic emotional responses across four trauma types: sexual assault, physical assault, transport accident and illness or injury. They reported, contrary to their hypothesis, that the peri-traumatic emotional response was of comparable intensity across all event types. When they examined post-trauma responses, however, they observed that participants who had experienced sexual assault had significantly higher levels of distress than that reported for other event types.

Previous research into meaning-making, both in the context of trauma (e.g., Macleod, 1999) and more generally (e.g., Malle, 2004), has asserted that the types of meanings made are influenced by event type. From
the theoretical perspectives offered by Janoff-Bulman (1992) and Park and Folkman (1997), the degree to which an event “shatters” core assumptions or global meaning structures will impact on the levels of distress and the coping mechanisms required for recovery. The diversity of events that participants responded to in the studies by Frazier, Keenan et al. (2011) may have introduced variability in meaning-making responses that was not accounted for in the statistical analysis.

3.4.3.4 Summary of empirical findings. The findings reported in this section indicate that there has been an uneven pattern of support for the TMPC. Present control has reliably demonstrated a significant and unique relationship with measures of coping, positive life changes and adjustment across a range of traumatic and stressful life events, however, the past control and future control constructs have been more problematic. Frazier, Keenan et al. (2011) suggested that both past and future control were related to increased distress in the aftermath of uncontrollable stressful events, however future control is possibly more adaptive in the context of a controllable event, such as an exam. Despite the inconsistency of the empirical support, Frazier, Keenan et al. (2011) continued to assert the importance of differentiating between the temporal orientation of control beliefs when understanding the link between “meanings made” and posttrauma outcome.

In their suggestions for future research, Frazier, Keenan et al. (2011) recommended studies that utilised more diverse samples that could explore possible age-based, gender and ethnic differences. They also advocated the further exploration of moderator variables and how control beliefs may differentially link with outcomes based on the objective controllability of the event. From a clinical perspective, Frazier Keenan et al. (2011) suggested that future research could look at the link between encouraging a focus on present control strategies in therapeutic interventions and treatment outcome.
3.4.5 Summary. The empirical findings presented in this section further highlight the complexity and diversity of individual responses to trauma discussed in Section 2.2. Although traumatic events undeniably stimulate the meaning making process, pinning down the nature of “meanings made” and the links with posttrauma outcome represent a challenging task. Early empirical work into self-blame attributions following trauma produced conflicting findings. This suggested that a more nuanced conceptualisation, which considered other factors in addition to self-blame, was required. Frazier et al.’s (2001) theory highlighted the significance of perceived control and temporal orientations for the link between meaning and adjustment; however empirical work in this area has also been inconclusive.

Further investigation of the TMPC is a primary objective of the current study, both with regard to the validity of this model in capturing responses to a traumatic event and in terms of the relationship between temporal orientations and other variables. The elements of the current study are presented and discussed Chapter Four.

3.5 Chapter Summary.

Building on the premise that meaning-making is a fundamental human attribute, this Chapter reviewed literature pertaining to meaning making in the aftermath of traumatic events and the implications for posttraumatic adjustment. First, Ehlers and Clark’s (2000) cognitive model of the maintenance of PTSD was presented as an explanation of the central role of cognitive processes in the maintenance of PTSD. This was followed by research into vulnerability, risk and resilience factors for PTSD, with an emphasis on variables that are investigated in the current study. It was argued that pre-existing vulnerabilities, while difficult to study due to methodological constraints, are important in understanding individual responses to trauma as they form the “diathesis” that interacts with the “stress” of the traumatic event.
The next section presented theories that described the link between traumatic events and meaning-making. Both Janoff-Bulman (1992) and Park and Folkman (1997) asserted that people possess deeply-held beliefs (or assumptions) about the world that are significantly challenged by trauma. The mismatch between foundational beliefs and the traumatic event stimulates meaning-making processes. A considerable amount of empirical work has focussed on whether some outcomes of this process (“meanings made”) are more conducive to adjustment than others; however findings remain inconclusive.

Frazier et al.’s (2001) temporal model of perceived control was presented as an attempt to draw together various strands of research to provide a comprehensive theory of meaning-making and adjustment following trauma. Empirical investigations have provided strong support for the adaptiveness of present control; however the past and future control dimensions have produced mixed results.

The next Chapter (Chapter Four) outlines the current study. This includes an integration of the findings of the literature review and a discussion of the areas that require further exploration and clarification. The research aims are described, along with an overview of the methodology and the approach to statistical analysis. Finally, the research questions and hypotheses are provided.
Chapter Four: The Current Study.

4.1 Introduction.

This chapter describes the current study. To begin, gaps in the literature reviewed in Chapters Two and Three are identified and discussed. Addressing these gaps constitute the conceptual foundation for the current study. This is followed by the study’s aims, research questions and hypotheses. Finally, a brief outline of the methodological design and the rationale for this approach is provided.

4.2 Identified Gaps from the Literature Review: The Foundations of the Current Study.

The literature review (Chapters Two and Three) offered a discussion of several topics: causal meaning-making; risk and resilience factors in the development of PTSD; the links between trauma, meaning-making and adjustment; and a theory regarding this process, the Temporal Model of Perceived Control (TMPC; Frazier et al., 2002). In order to delineate the conceptual foundation of the current study, this section identifies gaps in the extant research. The foci for this section are: (1) lay theories of meaning making following trauma; (2) pre-existing biases and self-confirming cycles; (3) meaning-making in the absence of an actual event; and (4) individual differences and complexity in meaning-making responses. The concepts outlined in this section lead into the aims, research questions and hypotheses provided in Section 4.3.

4.2.1 Lay theories of meaning-making after trauma. Lay theories (also called “folk”, “implicit”, or “naïve” theories) were discussed extensively in Chapter Two in relation to attribution research, however this concept has not been applied in the literature to meaning-making responses to trauma. The term “lay theories” refer to the beliefs or frameworks that people employ to “facilitate the understanding of complex information” (Plaks, Levy, & Dweck, 2009, p. 1069). Studies of meaning-making
responses to trauma have typically focused on the type of meanings made and their impact on adjustment, as opposed to whether there are identifiable lay understandings that guide these processes. The meaning made of an event is undeniably important, however, people are not an “empty vessel” to which trauma occurs. Lay understandings of why events occur, and the how they should be coped with, influence actual responses.

In the trauma context, lay theories include the beliefs people hold about the way they would interpret an event if it happened to them. They might involve beliefs about how they would cope with the event or their understanding of why such events occur. These may form part of an individual’s pre-existing vulnerability or protective factors that interact with the “stress” of the traumatic event. There are several reasons why lay theories may not correlate perfectly with actual interpretations, not least of which being the fact that people seldom have full conscious access to their cognitive processes (Nisbett & Wilson, 1977). That said, they are likely to influence subsequent meaning-making. This notion is further considered in the next section on self-confirming cycles.

4.2.2 Pre-existing cognitive biases and self-confirming cycles. A related concept to lay theories, which has also not been examined in the extant trauma research, is that of self-confirming cycles or cognitive biases. Self-confirming cycles (a.k.a “self-fulfilling prophecies” or “exacerbation cycles”) are pre-existing beliefs that bias the perception of information from the environment (Storms & McCaul, 1976).

In their review of attribution theory, Kelley and Michela (1980) noted that while it is simpler for researchers to treat attribution as a linear process (i.e., event – attribution – outcome), in reality the model is circular and interactive. Social psychologists have long proposed that the social world is constructed and shaped by both internal (originating from the person) and external (originating from the environment) information (see Madon, Willard, Guyll, & Scherr, 2011, for a discussion in relation to self-
fulfilling prophecies). In the trauma literature, the conceptualisation of meaning-making processes has tended to be linear. This is simpler for empirical investigation, but fails to capture the qualities of the individual that may “prime” or influence the meaning-making process.

4.2.3 Meaning-making in the absence of an actual event.

Connected to notions of lay theories and self-confirming cycles is the observation that people utilise meaning-making processes even in the absence of actual events (Leary, 2004). People do not just make sense of their experiences, but of events they imagine, perhaps prompted by media reports or experiences of their friends and acquaintances. In his book, *The Curse of the Self*, Leary proposed that the human capacity for complex cognition, such as problem-solving, perspective-taking and imagination, is a two-edged sword. While it enables the uniquely human capacity for language, complex social relationships and scientific innovation, it is also a central cause of emotional distress, particularly in the form of worry and rumination. As Mark Twain famously quipped, “My life has been filled with many tragedies, most of which never occurred” (cited in Leary, p. 78).

One area where this impact has been observed is in research into the fear of crime. This research has suggests that around 20% to 30% of the population experience fear about the possibility that they will be a victim of crime (Farrall & Gadd, 2004). Interestingly, fear of crime is relatively unlinked to personal experiences of victimisation (Jackson, 2009). Researchers have investigated factors that increase the likelihood of fear (e.g., Hale, 1995; Jackson, 2009). Risk factors have predominantly emphasised demographic variables (i.e., gender, age, geographic location) as well as some psychological concepts such a self-efficacy or perceptions of likelihood that a crime will occur (Jackson). The nature of the cognitive process behind fear of crime, including meaning-making or attributional processes, does not appear to have been examined.
The trauma literature has focused on how people make sense of actual traumatic events, as this, arguably, has the strongest link with modelling risk factors and developing effective treatment. Yet, given the influence of lay theories and self-confirming cycles, a sole focus on processes for actual events may be too restrictive. People are frequently making sense of traumatic events, be it experiences they have had themselves; things that they have heard about from other sources; or worries about situations that could possibly occur. These “imagined” events would potentially engage similar cognitive processes, and may be influential if an actual event was to occur. Imagined events may also cause distress (such as with fear of crime) that impact wellbeing and influence behavioural responses. Investigating whether a theoretical model of meaning making developed for actual events, the Temporal Model of Perceived Control, adequately captures meaning-making for an imagined event, is a central component of the current study.

4.2.4 Individual differences and complexity. The final point raised in this section is less a gap in the literature and more a problem that pervades the research. If there has been one observation that has resonated throughout the literature review, it has been that the variables being studied are complex, and that a simple explanation does not seem to fit. Researchers across the attribution and trauma literature have formulated theories that attempt to identify common processes; in practice, the empirical findings have seldom matched the clarity of the theoretical predictions. A relevant example of this is the Temporal Model of Perceived Control. The empirical support for the present control dimension has been strong, however, the past and future control dimensions have produced less consistent results. As emphasised by Bonnano and Mancini (2012), studies of trauma frequently target the “average” response at the expense of elucidating the diversity in individual functioning.
The source of complexity in the relationships among variables is multifaceted. Perhaps most influential are the challenges inherent in measuring abstract constructs such as “meaning-making”. Chapter Two highlighted the opinion that many aspects of meaning-making operate unconsciously (see Hassin et al., 2002; Ramachandran et al., 2009 for examples of implicit processes in causal inferences) and are difficult to access using self-report questionnaires. A frequently cited paper by Nisbett & Wilson (1977) addressed the issue of research participants being asked to tell “more than we can know” (p. 231). They investigated the idea that people do not have detailed access to their cognitive processes, and therefore rely on a priori causal theories, biases and context-specific information in formulating responses as to why they think or behave as they do. This issue is undoubtedly relevant to studies of meaning-making and trauma – it is likely that participants are not reporting on all aspects of their attributional processes and are influenced by pre-existing beliefs or how they are feeling at the time of completing the study measures.

A further issue when focusing on pre-existing vulnerabilities is the ways in which the trauma itself will influence other variables, which leads to the need for prospective studies. Complexity also arises from the ways in which variables interconnect. Characteristics such as personality, meaning-making and distress do not exist as discrete factors; they are inherently interrelated. This is captured by the notion of self-confirming cycles described above, but also relates to shared causal mechanisms – humans are both similar and unique. Researchers grapple with identifying “universals”, but must also acknowledge the fact that there are “no two [people] alike” (Harris, 2007). The diathesis-stress model of pathology, which has been mentioned throughout the literature review, is perhaps the best attempt to capture the fundamental interconnectedness between the individual vulnerabilities and their environment.
4.2.5 Summary. This Section has identified gaps in the literature presented in Chapters Two and Three. This included the role of lay theories and self-confirming cycles in meaning-making processes, meaning-making in the absence of actual events, and the enduring problem of acknowledging individual differences and complexity when investigating psychological constructs. Addressing these gaps and issues is the aim of the current research. The study’s aims, research questions and hypotheses are presented in Section 4.3.

4.3 Aims, Research Questions and Hypotheses.

This section contains the aims of the current research and the variables that are examined. These aims comprise the foundation for the research questions and hypotheses that were tested and interpreted.

4.3.1 Research aims. The current study addresses gaps in extant research by investigating meaning-making processes for an imagined traumatic event. The imagined traumatic event is an armed robbery at an Automatic Teller Machine (ATM), presented to participants using a vignette (a copy is provided in Appendix A). This investigation sought to clarify lay theories of meaning following trauma and the pre-existing beliefs that may influence meaning-making processes following actual traumatic events. From a clinical perspective, deepening our understanding of the beliefs that characterise meaning-making following trauma, and how these link to other individual characteristics, can assist in understanding the factors that contribute to the development and maintenance of posttraumatic distress. The knowledge that some forms of meaning-making are more adaptive than others can inform treatment interventions.

The aims of the current study were:

(1) To test the validity of applying a model of meaning-making developed for posttraumatic responses, the Temporal Model of Perceived Control, to the context of an imagined traumatic event;
(2) To analyse the relationships between the temporal orientations and other individual characteristics, such as personality attributes. In addressing these aims the study explored two categories of variables: meaning-making variables and individual characteristics. These variables are listed in Table 4.1.

Table 4.1

<table>
<thead>
<tr>
<th>Category</th>
<th>Variable name</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Meaning-making Variables</strong></td>
<td></td>
</tr>
<tr>
<td>Temporal orientations of perceived control</td>
<td>Past control orientation</td>
</tr>
<tr>
<td></td>
<td>Present control orientation</td>
</tr>
<tr>
<td></td>
<td>Future control orientation</td>
</tr>
<tr>
<td><strong>Individual characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>Demographic variables</td>
<td>Gender</td>
</tr>
<tr>
<td></td>
<td>Age</td>
</tr>
<tr>
<td></td>
<td>Country of origin</td>
</tr>
<tr>
<td>Personality variables</td>
<td>Neuroticism</td>
</tr>
<tr>
<td></td>
<td>Avoidant attachment type</td>
</tr>
<tr>
<td></td>
<td>Ambivalent attachment type</td>
</tr>
<tr>
<td></td>
<td>Dispositional optimism</td>
</tr>
<tr>
<td>Current general distress</td>
<td>Clinical distress</td>
</tr>
<tr>
<td>Current traumatic distress</td>
<td>Traumatic distress</td>
</tr>
</tbody>
</table>

The measurement of the variables is described in the Methodology Chapter (Chapter Five, Section 5.2). In this section, the rationale for the selection of these variables is offered.

First, the temporal orientations of perceived control are included as these are the beliefs proposed by the Temporal Model of Perceived Control, which is the theory being investigated in the current study. Second, a number of individual characteristics are also explored in the current study. These were selected based on identified relationships with posttraumatic stress, as highlighted in Section 3.1.2 of the literature review, as well as with the temporal orientations. For example, a study by Wei, Heppner, and
Mallinckrodt (2003) found that perceived coping abilities, which are analogous to the Present Control orientation, fully mediated the relationship between attachment and psychological distress. This indicated that the relationship between insecure attachment types and the individual’s beliefs about their ability to cope with stressful situations was important when considering levels of functioning. The relationships between attachment type and perceived control orientations are investigated in the current study.

Frazier, Keenan et al. (2011) also reported statistically significant relationships between Present Control and Extraversion, Neuroticism and Optimism. Notably, Frazier et al. did not find significant relationships between personality variables at either Past or Future Control. Whether this pattern of results is replicated in the current study was examined.

Thirdly, while not specifically discussed in Chapter Three as a vulnerability for PTSD, it was believed that a variable that detected clinical levels of general psychological distress was important to enable consideration of the impact of current psychopathology on meaning-making processes. Therefore, a measure of “clinical distress” was included in the analysis. “Traumatic distress” was also measured to determine whether participant’s residual distress from previous traumatic experiences impacted on their endorsement of the temporal orientations – literature reviewed in Chapter Three had indicated that previous traumatic events are a risk factor for PTSD (e.g., Breslau et al., 2008; Ozer et al., 2008). Demographic variables were selected based on links with increased risk of PTSD noted in the Brewin et al. (2000) meta analysis.

4.3.2 Research questions and hypotheses. In order to address the current study’s aims, four research questions and one hypothesis were devised and tested. The central concern of the current study was to examine the validity of the Temporal Model of Perceived Control (TMPC) as a model of meaning-making for the imagined traumatic event. It was proposed that this model would apply to the meaning-making processes
observed in the current study; however as this was a novel application of the theory it was decided to investigate this in the context of both a hypothesis and a research question, provided below.

**Hypothesis 1:** That the TMPC would be a valid representation of the meaning-making processes observed for the imagined traumatic event, measured by the adequate fit of this model to the data obtained.

**Research Question 1:** What are the similarities and differences between the TMPC as it applies to an imagined event, compared with past research with actual traumatic events?

Following investigation of the TMPC, the relationships among the temporal orientations and other individual characteristics were explored. These relationships were expected to be more complex and difficult to predict for some temporal orientations than for others. This is particularly true for future control, which has exhibited a varying relationship with distress depending on the objective controllability of the event. As the imagined traumatic event, an armed robbery at an ATM, is not objectively controllable, the current study is based on the assumption that future control beliefs are *not* adaptive in this context. Predictions about the relationships among individual characteristics and present control were able to be made with greater confidence as previous studies have described a less variable pattern of results. Therefore, the present control orientation is conceptualised as adaptive, whereas the past and future control orientations are conceptualised as less adaptive responses.

The operationalisation of the “adaptiveness” of the individual characteristics was guided by the identified relationships with PTSD in the vulnerability, risk factor and resilience literature reviewed in Section 3.2.2-3. The individual characteristics, and their relationship with PTSD, are presented in Table 4.2.
Table 4.2

*Proposed Relationships Between the Individual Characteristics and Posttraumatic Stress Disorder.*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Relationship with PTSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neuroticism</td>
<td>Positive correlation</td>
</tr>
<tr>
<td>Ambivalent Attachment</td>
<td>Positive correlation</td>
</tr>
<tr>
<td>Avoidant Attachment</td>
<td>Positive correlation</td>
</tr>
<tr>
<td>Optimism</td>
<td>Negative correlation</td>
</tr>
<tr>
<td>Extraversion</td>
<td>Negative correlation</td>
</tr>
<tr>
<td>Age</td>
<td>Younger age associated with increased risk</td>
</tr>
<tr>
<td>Gender</td>
<td>Female gender associated with increased risk</td>
</tr>
<tr>
<td>Country of origin</td>
<td>Minority status associated with increased risk</td>
</tr>
<tr>
<td>Current traumatic distress</td>
<td>Positive correlation</td>
</tr>
<tr>
<td>Current general distress</td>
<td>Positive correlation</td>
</tr>
</tbody>
</table>

PTSD = Posttraumatic Stress Disorder.

On a general level it was proposed that present control would negatively correlate with PTSD risk factors and past and future control would positively correlate with these factors. However, the strength and the uniqueness of these relationships (i.e., which characteristics are unique predictors?) was more difficult to predict, given that this study represents an application of the temporal control orientations to a new context (i.e., an imagined trauma).

Given the degree of uncertainty about the relationships between the individual characteristics and the temporal control orientations it was decided to utilise research questions.

*Research Question 2:* What is the nature of the relationships between the temporal control orientations and other individual characteristics?
Research Question 3: Do any of the individual characteristics uniquely predict the present, past or future control orientations?

Research Question 4: How do the relationships identified between temporal control orientations and the individual characteristics compare to the adaptiveness of these variables suggested by risk factor research?

4.4 Study Design.

Selection of the methodological approach is an important component of any research and requires careful consideration to weigh up the potential strengths and limitations. In this section the study design is briefly presented before examining the reasons for selecting this approach. This rationale is returned to in Chapter Nine, when the limitations of the current study are evaluated.

4.3.1 Overview of the methodology. As mentioned in previous sections of this Chapter, the current study asked participants to read a vignette that detailed an armed robbery at an ATM and then imagine themselves in this situation. Based on this imagined experience participants then responded to some questions about the vignette and completed a measure of the TMPC. The individual characteristics were measured using questionnaires completed prior to reading the vignette. This sequence was adopted so the vignette itself could not influence responses to the individual characteristic measures.

4.3.2 Rationale for the methodology. Several issues were considered in the design of the current study. This section outlines the rationale for the selection of the methodology; greater detail about the measures and procedure is provided in Chapter Five. First, to emphasise the cognitive processes (i.e., the meaning-making beliefs) it was decided to hold the type of traumatic event being examined constant. It was noted in Chapter Two, specifically with regard to the Frazier, Keenan et al. (2011) study, that having participants respond on the basis of a range of events,
with varying severity, introduced additional unpredictability into the model. Given that event type and severity are risk factors for PTSD in and of themselves (Breslau et al., 1998; Hetzel-Riggin & Roby, 2013), it is difficult to disentangle cognitive processes from the influence of these event-related factors on distress.

A limitation of using an imagined event is that the degree to which it generalises to how the person may actually respond if the event happened to them is unknown. However, it is not being proposed that the cognitive processes employed for actual versus imagined events are the same; the aim of the current study was to determine the degree to which they are analogous. In addition, it was thought that an imagined event may better tap into the pre-existing cognitive structures that represent people’s lay theories regarding the interpretation of traumatic events. Given that these lay theories are of most interest to the current study, it was felt that holding the traumatic event constant for all participants was more important than ensuring that people reflected on something from their direct experience.

A further issue for trauma researchers is recruiting a sample size large enough to enable complex statistical analysis. Statistical techniques that test the validity of measurement models or indirect and direct prediction of outcomes require several hundred data points (Tabachnik & Fiddell, 2007), particularly when the effect sizes being detected are small. Studies utilising clinical samples tend to be restricted by small sample sizes, as do those where the participants have all experienced the same actual trauma (e.g., sexual abuse).

There were also ethical issues to take into account in asking participants to reflect on a trauma that has occurred to them – consideration needed to be given to the risk of re-traumatisation and the availability of support services if this occurred. This was arguably even more important in the case of an online questionnaire, as utilised in the current study, where the researcher was not able to gauge the impact of the research on the
participant. Asking participants to imagine an event kept it at an “arm’s length”. While it is possible that some participants still may found this distressing, clear instructions at the beginning of the study flagged the nature of the vignette and asked people not to continue if they felt it would upset them. The details of support services were also provided.

4.5 Chapter Summary.

This chapter has described gaps identified in the literature reviewed in Chapters Two and Three and has discussed the ways in which the current study will address these areas. The aims, research questions and hypotheses were presented, as was an outline of the methodology and the rationale for this approach. The next Chapter, Chapter Five, outlines the study’s methodology. This includes a description of the sample; the measures used; and the procedure, including the preparation of the dataset and an overview of data analysis. Chapters Six and Seven contain the findings of the statistical analyses.
Chapter Five: Methodology

5.1 Introduction.

This chapter describes the sample recruited for the current study, the measures employed, and how the study was conducted. It also contains information about the preparation of the dataset and an overview of the data analysis undertaken and reported in Chapters Six and Seven.

5.2 Participants.

Participants were recruited via several avenues, including: first year psychology students completing research as a course requirement; University students responding to an advertisement on the internal website; friends and acquaintances of the researcher; and visitors to psychology research websites. Six hundred and five people submitted a questionnaire. Following dataset preparation (described in Section 5.4.2) the final sample comprised 589 participants.

Both genders were represented fairly equally in the sample – 57% were female and 43% were male. Typical of a student population, 78% of participants were aged under 30 years old. The mean age of the sample ($M = 25.65, SD = 9.67$) was slightly older than expected, however, due to a few participants being aged over 60 years old. Also consistent with the norms of a student population, 89% of the sample were currently studying and 81% were not working or employed part time. The highest level of educational attainment was high school for 55% of participants; 44% had completed a TAFE or University qualification and 1% had only completed Primary School education. With regard to relationship status, 46% of the sample was single; 10% were in a casual relationship; 25% were in a long-term relationship; 16% were married/de facto; and 3% were divorced/separated/widowed.

Just over a third of the participants (35%) were born in a country other than Australia or New Zealand. This is fairly typical of both the student population, which contains a significant number of international
students, and the Australian population more generally. Participants listed their country of birth, which was then grouped by region (i.e., Asia, Europe, North America, South America, Africa and Middle East). Thirteen per cent of the sample was born in an Asian country, 9% in Europe and 9% in North America. The remaining participants were born in Africa, the Middle East or South America. Two participants did not indicate their country of birth.

5.3 Materials.

Participants completed an online questionnaire comprising demographic questions – regarding sex, age, relationship status, educational attainment and employment – and established measures of psychological distress, neuroticism, and adult attachment type. Participants also responded to questions regarding their previous experience of traumatic events. Finally, participants read the vignette developed for this study (see Appendix A) and completed a measure of the temporal orientations. The measures are outlined below in order of their appearance in the questionnaire. Information regarding clearance from the University Ethics Committee and the plain language statement provided to participants are included in Appendices B and C respectively.

5.3.1 Depression Anxiety and Stress Scale – Short Form. The Depression Anxiety and Stress Scale – Short Form (DASS-SF; Lovibond & Lovibond, 1995) is a 21-item measure of the core symptoms of depression, anxiety and stress shortened from the original 42-item measure. Respondents indicate the degree to which a series of statements reflects their experience in the past week on a scale of 0 (Did not apply to me at all) to 3 (Applied to me very much, or most of the time). Items are grouped according to three seven-item subscales: Depression (e.g., “I couldn’t seem to experience any positive feeling at all”); Anxiety (e.g., “I was aware of dryness of my mouth”); and Stress (e.g., “I found myself getting upset by quite trivial things”). Scores for the short form of the questionnaire are
doubled to correspond with the values obtained by the longer measure; therefore subscale scores range from 0 to 42.

The DASS has been administered across a number of settings with both clinical and non-clinical populations (Crawford & Henry, 2003). In a study of psychometric properties utilising both the long and short forms of the DASS with non-clinical and clinical samples Antony, Bieling, Cox, Enns, and Swinson (1998) found that both scales exhibited internal consistency and concurrent validity within the adequate to excellent range. Analysis of the factor structure of the DASS-SF (Henry & Crawford, 2005) identified a four-component model (with the fourth factor reflecting the propensity for negative affectivity) as representing the best fit. Henry & Crawford concluded that each subscale (Depression, Anxiety & Stress) represented a distinct construct, but that there was also a shared “general distress” factor that correlated between $r = .36 - .71$ with the subscale items.

5.3.2 Exposure to Traumatic Events Questions. Participants responded to four questions regarding their personal experience of traumatic events: (1) whether they had experienced a violent crime; (2) whether they had been in danger of being seriously injured or killed; (3) whether they had witnessed a person being seriously injured or killed; or (4) any other traumatic event such as these. Participants responded “yes” or “no”. Those who responded yes were then asked whether such an event had happened more than once; when it occurred (less than a year, between a year and two years, more than two years); whether they were injured in the event; and how traumatic the event was for them both when it happened and now. Participants responded to the last three questions on a scale of 1 (not at all) to 7 (extremely). These questions were developed specifically for the current study; therefore psychometric information is not available.

5.5.3 Neuroticism and Extraversion. The Neuroticism and Extraversion constructs were measured using the Neuroticism and Extraversion subscales of the Australian Personality Inventory (API)
(Murray et al., 2009). The API is a short measure of the widely research and supported five-factor model of Personality (i.e., Neuroticism, Extraversion, Openness to Experience, Agreeableness, Conscientiousness; Costa & McCrae, 1992). It comprises items taken from Goldberg’s International Personality Item Pool, available online (http://ipip.ori.org/). Both the Extraversion and Neuroticism subscales have 10 items. The Neuroticism scale includes items such as “I often feel blue” and “I panic easily”. The Extraversion scale has items such as “I am skilled in handling social situations”. Participants respond, on a 5-point Likert scale, to the accuracy of each item in describing them generally (1 = Very Inaccurate; 5 = Very Accurate). Scores on each subscale range from 10 to 50.

Principal component analysis has confirmed the five-factor structure of the API (Murray et al., 2009). Internal consistency is adequate and comparable with that reported for the 12-item subscales of Costa and McCrae’s NEO-FFI (Murray et al.). Convergent validity between the API and other measures of the five-factor model (e.g., NEO-FFI) is also adequate (Murray et al.).

5.3.4 Experiences in Close Relationships Scale – Short Form.
The Experiences in Close Relationships Scale – Short Form (ECRS-SF; Wei, Russell, Mallinckrodt, & Vogel, 2007) was used to measure adult attachment type. The scale comprises two six-item subscales which measure ambivalent attachment and avoidant attachment. Ambivalent attachment is defined as an excessive fear of rejection or abandonment by others, accompanied by a need for approval. An example item is “My desire to be very close sometimes scares people away”. Avoidant attachment involves a fear of dependence and interpersonal intimacy. An example item is “I try to avoid getting too close to my partner”. Participants indicate their agreement with each statement in terms of their experiences in relationships on a 7-point Likert scale (1 = disagree strongly; 7 = agree strongly). Six items are
reverse coded and summed with the remaining subscale items to produce two subscale scores. The score for each subscale ranges from 6 to 42.

Wei et al. (2007) conducted six studies exploring the psychometric properties of the ECRS-SF compared with the longer measure. Confirmatory factor analysis supported the hypothesised two-factor structure of the scale and reliability and validity were adequate and equivalent to that reported for the longer scale (Wei et al.). Cronbach’s alpha across several studies ranged from .78 to .86 for the anxiety subscale and .78 to .88 for the avoidance subscale (Wei et al.).

5.3.5 Life Orientation Test – Revised. Dispositional optimism, defined as the generalised expectancy for positive versus negative outcomes, was measured using Scheier, Carver, and Bridges’ (1994) revised version of the Life Orientation Test (LOT-R). The LOT-R contains 10 items: 6 measuring optimism (e.g., “In uncertain times I usually expect the best”) and 4 filler items not used in scoring (e.g., “It’s easy for me to relax”). Participants indicate their level of agreement with each statement on a scale of 0 to 4 (0 = strongly disagree; 4 = strongly agree). Negatively-worded items are reverse-coded. Scores are added to produce an overall indication of optimism, ranging from 0 to 24. Scheier et al. reported adequate internal consistency (Cronbach’s alpha = .78). The retest correlations taken over 28 months range from .56 to .79, indicating that the LOT-R is relatively stable over time. Predictive and discriminant validity has also been found to be adequate (Scheier et al.).

5.3.6 Victim of Crime Vignette. The victim of crime vignette was developed specifically for the current study. The criteria for the construction of the vignette were that it was plausible; applicable for a wide range of participants regardless of age or gender; and would represent an event that would meet the criteria for a traumatic event as defined by the DSM-IV-TR for the diagnosis of PTSD. The text of the vignette is provided below:
It is 8pm on Saturday night and you are driving to a restaurant to meet friends for dinner. On your way you stop at an Automatic Teller Machine (ATM) in a shopping strip to withdraw some cash. You park your car nearby and walk to the ATM. Most of the shops are closed and you can’t see anyone around. While at the ATM someone walks up and stands behind you. You assume they want to use the machine and don’t turn around or give their presence a second thought. After you take your money ($100) the person behind you grabs you in a headlock. You feel something sharp pressing against your back. The person says “Don’t move or scream or else I’ll stab you”. The person reaches into your coat pocket, takes out your phone and throws it on the ground. He says “How much money in your account?” You are so afraid that you can barely speak. You feel sure that the object he’s pressing against your back is a knife. He grips you tighter and says “You wanna die? How much? I’ll know if you lie.” You respond “I don’t know…maybe $200?” “Take it out” he says, “fast”. You do as he says and he grabs the money, pushes you into the ATM with considerable force and runs away. You fall to the ground and stay there for a few minutes, shaken and afraid he might come back. Thankfully you still have your car keys. You get in your car and drive to the police station to report what has happened.

Prior to inclusion in the questionnaire, the vignette was circulated to seven postgraduate psychology researchers who were asked to provide feedback on two areas: (1) the degree to which the vignette was plausible and easy to comprehend; (2) the extent to which the situation described would provoke fear or threat. The psychology researchers were asked to rank each of the areas on a scale of 1 (not at all) to 5 (very much). Suggestions for changes to the vignette were also welcomed. Results from
preliminary testing indicated that the vignette was rated very highly by participants (an average over four for all criteria). One minor change to the wording was suggested and incorporated.

After reading the vignette, participants were asked how threatening they found the situation that was described. They responded on a scale of 1 (not at all) to 5 (extremely). They were also asked whether a similar event had occurred to them or someone they knew, which was answered on a yes/no basis. Other questions regarding attributions to external causes were also posed, however these were not utilised in the current study’s data analysis.

5.3.7 Perceived Control of Stressful Events Scale. The Perceived Control Over Stressful Events Scale (PCOSES; Frazier, Keenan et al., 2011) measured the Temporal Model of Perceived Control. The PCOSES has three subscales: past control, present control and future control. A fourth subscale, future likelihood, was omitted from the current study. The past control subscale has five items and measures the degree to which a person believes the traumatic event occurred because of something they did (e.g., “I could have done something to prevent this from happening”). The present control subscale has eight items and focuses on what can be done in the present to manage the impact of the traumatic event (e.g., “I have control over my day-to-day reactions to this event”). The future control subscale has four items and taps into beliefs about preventing further traumatic events from occurring (e.g., “I can do things to make sure I will not experience a similar event in the future”).

In the current study participants were asked to respond according to how they would feel if the event depicted in the vignette occurred to them. Participants recorded their level of agreement with each statement on a scale of 1 (strongly disagree) to 4 (strongly agree). Subscale scores range from 5 to 20 (past control), 8 to 32 (present control), and 4 to 16 (future control).
Psychometric properties of the scale were reported by Frazier, Keenan et al. (2011). Their exploratory and confirmatory factor analysis confirmed the three-factor structure of the measure. Cronbach’s alpha coefficients across two samples were above .75 for all subscales: .77-.86 (present control); .82-.89 (past control); .80-.90 (future control). Frazier, Keenan et al. also report test-retest correlations of between $r = .48$ (present control) and $r = .80$ (past control).

5.4 Procedure.

This section contains a description of the steps taken by study participants, as well as the dataset preparation process. An overview of the data analysis, which is reported in Chapters Six and Seven, is also provided.

5.4.1 Instructions to participants. Participants completed the online questionnaire at a time and place selected by them. The plain language statement informed participants of the nature of the vignette and recommended that those who would find imagining such an event distressing not to continue. Submission of a completed questionnaire was considered to indicate informed consent.

5.4.2 Dataset preparation. Prior to analysis the dataset was screened and some preliminary analyses conducted regarding responses to the vignette. This section contains three parts: (1) Dataset clean-up (e.g., addressing missing values, calculating subscale scores); (2) Examining the distribution of variables; (3) Investigating responses to the vignette itself.

5.4.2.1 Dataset clean-up. As mentioned in the description of the sample, 605 questionnaires were submitted. The first step of data screening was to code the demographic variables; during this process three participants aged under 18 years old were detected and removed from the sample.

The next step was to remove participants with >10% missing data on any of the scales used in the study. Fifteen participants were removed from the dataset on this basis. For participants where the number of missing
values did not exceed 10% the Full Information Maximum Likelihood method of estimation was used to replace these values. It was determined that the data was missing completely at random – there were no items that had an unusually high number of missing values.

Following the treatment of missing data, the dataset was analysed for “improbable” responses, such as the same answer for every question (e.g., “1” for every one of the Neuroticism items). One participant was removed from the sample for this reason. The sample following data screening contained 589 participants.

After the removal of incomplete data, each of the measures was individually inspected and reverse-scored items were re-coded. Following this, subscale scores were calculated to enable the consideration of the normal distribution. Outliers were assessed using frequency tables and box plots. No outlier values were detected.

5.4.2.2 *Assessment of the distribution.* The Neuroticism, psychological distress (Depression, Anxiety, Stress), Attachment Anxiety, Attachment Avoidance and Optimism measures were evaluated for adherence to a normal distribution. The PCOSES responses were not inspected at this stage as the measurement model was untested.

Assessment of the subscales’ distribution was conducted according to guidelines provided by Pallant (2011). Pallant suggests that for large samples, such as that in the current study, the skewness and kurtosis measures tend to be less helpful as indicators of normal distribution. Therefore, the primary method for determining normality was the inspection of histograms to see how well they fit the bell-curve distribution.

One set of measures that clearly violated the assumption of normality were the psychological distress measures (Depression, Anxiety and Stress). The data for each subscale was positively skewed – high scores on these measures were considerably less common than low scores. This was understandable given the nature of the population; a non-clinical
sample is unlikely to have a normal distribution of psychological distress symptoms. The re-coding of this variable into clinical and non-clinical categories is described in Chapter Seven, Section 7.2.

For the other measures the observed distribution of scores was within the normal curve. Attachment Avoidance exhibited a slight positive skew, however closer inspection revealed that this seemed be the result of few scores at either the lowest or highest extreme of the measure. Consultation with other postgraduate researchers using this measure indicated that they had observed a similar distribution in their samples (which were also based on a student population). It was decided to leave this measure unaltered.

5.4.2.3 Vignette response variables. The final stage of dataset preparation was to investigate whether participants had responded similarly to the vignette itself. In order to utilize the entire sample for statistical analysis, it was important that there was reasonable consistency in the way the vignette was interpreted. As mentioned in Section 5.3.6, participants were asked to rate (on a scale of 1 to 5) how threatening they found the situation in the vignette and also whether a similar event had occurred to themselves or someone they knew. These variables were used to group the sample, which then enabled scores on the individual characteristics variables to be compared.

Ninety-one per cent of the sample (n = 536) rated the threateningness of the vignette above the midpoint of the scale (i.e., 3 or above). The file was split into those who found the situation threatening (score of 3 and above, n = 536) and those who had not (score of 1 or 2, n = 53). Although the numbers in each group were too unequal to permit statistical analysis, inspection of the mean scores on the personality measures indicated very little difference between the groups. For the demographic variables, the low scorers appeared substantially more likely to be male (74% of the low score groups, compared to 40% of the higher score group). Low scorers were also
slightly more likely to be younger (85% compared to 78%) and from a
country other than Australia, New Zealand and North America (34% 
compared to 25%). Given that the low scorers group represented under 10% 
of the total sample it was decided to retain these participants for subsequent 
analyses.

Nineteen per cent \( (n = 111) \) of the sample responded “yes” when 
asked if they, or someone they knew, had experienced an event similar to 
that described in the vignette. Given that this group represented almost 20% 
of the sample, it was decided that independent t test and cross tab analyses 
could be run. These analyses revealed no statistically significant differences 
(all \( p \) values > .05) between the groups.

5.4.3 **Overview of data analysis.** The statistical analysis of the 
data was divided into two stages. The first stage, reported in Chapter Six, 
explored the fit between the Temporal Model of Perceived Control (TMPC; 
as measured by the Perceived Control over Stressful Events Scale) and the 
current study’s data to investigate the validity of this model as a 
characterisation of meaning-making responses to an imagined traumatic 
event. This required the development and examination of a measurement 
model, which took place over three steps: exploration, calibration and 
validation. Prior to analysis the dataset was divided into three roughly equal 
parts using random allocation techniques.

For the exploration step an exploratory factor analysis (EFA) was 
conducted with one dataset. Following this, the second dataset was used to 
calibrate the measurement model using Confirmatory Factor Analysis 
(CFA). Finally, the measurement model was validated using a CFA with the 
third dataset. Performing a second CFA protected against the results of the 
calibration CFA being unduly influenced by vagaries of the sample and 
enhanced the robustness and generalisability of the findings. The specific 
statistical techniques and the criteria adopted to determine adequate fit are
described in Chapter Six. The findings of these analyses addressed Hypothesis 1 and Research Question 1.

The second stage of the analysis, reported in Chapter Seven, entailed examining the relationships among the temporal control orientations and the individual characteristics. This addressed Research Questions 2, 3 and 4. The first step was to run univariate analyses (t-tests and correlational analysis) to determine which characteristics were significantly related to the temporal orientations. Following this, regression analyses were undertaken to identify the unique predictors and the amount of variance explained by each variable in the temporal orientation.
Chapter Six: Data Analysis Part One – Exploratory and Confirmatory Factor Analysis of the Perceived Control Over Stressful Events Scale

6.1 Introduction.

This chapter describes the findings from the first stage of the statistical analysis. This involved using factor analytic techniques to determine whether the Temporal Model of Perceived Control (TMPC), as measured using the Perceived Control Over Stressful Events Scale (PCOSES), was a good fit with the participants’ responses (termed the observed data).

To recap from previous chapters, the TMPC proposes that one of the ways that people make sense of traumatic events is according to three temporal orientations: a past control orientation (labelled past control; e.g., “What could I have done to prevent this event from occurring?”); a present control orientation (labelled present control; e.g., “What can I do now to help recover from the event?”); and a future control orientation (labelled future control; “What can I do in the future to prevent other traumatic events happening?”) To test this model Frazier, Keenan et al. (2011) developed the PCOSES, which contained three subscales corresponding to each of the temporal control orientations. As reported in Chapter Three, Frazier et al. conducted psychometric testing to determine the reliability and validity of this measure.

In the current study this model was applied to an imagined traumatic event to determine whether these temporal control orientations also captured pre-existing beliefs about meaning-making and traumatic events. An adequate fit between the measurement model and the data would indicate that the temporal orientations of perceived control provided a valid representation of the meaning-making processes of participants. This part of the analysis addressed Hypothesis 1 and Research Question 1.
Hypothesis 1: The TMPC is a valid representation of the meaning-making processes observed for the imagined traumatic event, measured by the adequate fit of this model to the data obtained.

Research Question 1: What are the similarities and differences between the TMPC as it applies to an imagined event, compared with past research with actual traumatic events?

The analyses reported in this Chapter were conducted in three steps: (1) an Exploratory Factor Analysis (EFA); (2) calibration of the measurement model using Confirmatory Factor Analysis (CFA); (3) validation of the measurement model using CFA. To conduct these analyses the sample (N = 589) was divided into three datasets using random allocation techniques. These datasets were labelled: EFA dataset (n = 196); Calibration dataset (n = 197); and Validation dataset (n = 196). The starting point for the factor analysis was the 18-item PCOSES, as published by Frazier, Keenan et al. (2011; see Table 6.1, reverse-worded items are denoted with bold typeface).

6.2 Exploratory Factor Analysis of the Perceived Control over Stressful Events Scale.

The starting point for establishing whether participants had responded to the PCOSES in the same way as in previous studies (i.e., Frazier et al., 2011) was to conduct an Exploratory Factor Analysis (EFA). This step was undertaken because the current study used the PCOSES in a new research context; therefore, the assumption that the basic structure of the measure was the same needed to be tested. The EFA was expected to return a three-factor solution corresponding to the temporal control orientations. To begin, the data were analysed to test their suitability for EFA. Second, factor extraction was performed and interpreted, based on the Kaiser criterion (i.e., eigenvalues > 1).
Table 6.1.

*Items in the Perceived Control Over Stressful Events Scale.*

<table>
<thead>
<tr>
<th>Item</th>
<th>Subscale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I could have done something to prevent this event from happening.</td>
<td>Past Control</td>
</tr>
<tr>
<td>2. There isn’t much I can do to help myself feel better about the event.</td>
<td>Present Control</td>
</tr>
<tr>
<td>3. How I deal with the event now is under my control.</td>
<td>Present Control</td>
</tr>
<tr>
<td>4. There is nothing I could have done to prevent this event from occurring.</td>
<td>Past Control</td>
</tr>
<tr>
<td>5. I don’t have much control over my emotional reactions to this event.</td>
<td>Present Control</td>
</tr>
<tr>
<td>6. I can do things to make sure I will not experience a similar event in the future.</td>
<td>Future Control</td>
</tr>
<tr>
<td>7. When I am upset about this event, I can usually find a way to feel better.</td>
<td>Present Control</td>
</tr>
<tr>
<td>8. This event happened because of something I did or didn’t do.</td>
<td>Past Control</td>
</tr>
<tr>
<td>9. I have control over my day-to-day reactions to this event.</td>
<td>Present Control</td>
</tr>
<tr>
<td>10. There is nothing I can do to prevent a similar event from happening again.</td>
<td>Future Control</td>
</tr>
<tr>
<td>11. There isn’t much I can do to keep this event from affecting me.</td>
<td>Present Control</td>
</tr>
<tr>
<td>12. I didn’t have any control over the event occurring.</td>
<td>Past Control</td>
</tr>
<tr>
<td>13. I have control over how I think about the event.</td>
<td>Present Control</td>
</tr>
<tr>
<td>14. I have no control over whether a similar event happens to me again.</td>
<td>Future Control</td>
</tr>
<tr>
<td>15. I couldn’t have prevented it.</td>
<td>Past Control</td>
</tr>
<tr>
<td>16. My reaction to the event is not under my control.</td>
<td>Present Control</td>
</tr>
<tr>
<td>17. There are things I can do to reduce the risk that a similar event will happen again.</td>
<td>Future Control</td>
</tr>
</tbody>
</table>

6.2.1 **Tests for factorability of the data.** Prior to interpretation of the data, the output was considered as a whole to detect any obviously problematic results (e.g., results that violated basic expectations of EFA output). Initial inspection revealed that item 1 had generated some unusual
data; the communality value for the extracted factors was .99 and SPSS had generated a warning that “one or more communalities had returned a value above one during iterations”. The pattern and structure matrices for this item contained improbably high values (1.05 and .99 respectively). Also, the overall solution had a very unclear pattern of items loading onto several of the factors. Brown (2006) described the presence of out-of-range values as a limitation of the Maximum Likelihood analytic approach and recommended the use of Principal Axis Factoring if this occurs. It was therefore decided that Principal Axis Factoring would be employed for the current analysis. An initial scan of the output revealed that the problems with Item 1 and the unclear factor structure did not persist and interpretation could proceed.

Four tests were conducted to confirm the suitability of the data for factor analysis. First, the correlation matrix for the items was inspected. Tabachnick and Fidell (2007) recommend that each item exhibit a correlation of > .3 with at least two other items; this was true of the current data. Second, the Bartlett test of sphericity was significant ($p < .05$) which further established that there were sufficient correlations between the items. Third, the Kaiser-Meyer-Olkin (KMO) statistic of .81 was well above the recommended minimum value of .6 (Tabachnick & Fidell, 2007).

Finally, the communalities table, which describes the amount of shared variance between the items and the extracted factors, was inspected to ensure that each item had a communality > .3. One item, item 14 “I have no control over whether a similar event happens to me again (future control subscale)”, had an extraction communality of .29, which was below the cut-off and had reduced from an initial value of .37. This meant that the factor model explained considerably less variance in item 14 than the initial model. This indicated that this item did not appear to be a sound measure of any of the three factors and thus would be unlikely to fit subsequent measurement models. This item was removed and the EFA was run again.
The communality values for the remaining 16 items are provided in Table 6.2.

Table 6.2

**Communalities Table for Principal Axis Factor Extraction**

<table>
<thead>
<tr>
<th>PCOSES item (subscale)</th>
<th>Initial</th>
<th>Extraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I could have done something to prevent this event from happening (past control).</td>
<td>.56</td>
<td>.53</td>
</tr>
<tr>
<td>2. There isn’t much I can do to help myself feel better about the event (present control, reverse scored).</td>
<td>.42</td>
<td>.32</td>
</tr>
<tr>
<td>3. How I deal with the event now is under my control (present control).</td>
<td>.47</td>
<td>.49</td>
</tr>
<tr>
<td>4. There is nothing I could have done to prevent this event from occurring (past control, reverse scored).</td>
<td>.55</td>
<td>.60</td>
</tr>
<tr>
<td>5. I don’t have much control over my emotional reactions to this event (present control, reverse scored).</td>
<td>.41</td>
<td>.48</td>
</tr>
<tr>
<td>6. I can do things to make sure I will not experience a similar event in the future (future control).</td>
<td>.40</td>
<td>.47</td>
</tr>
<tr>
<td>7. When I am upset about this event, I can usually find a way to feel better (present control).</td>
<td>.63</td>
<td>.68</td>
</tr>
<tr>
<td>8. This event happened because of something I did or didn’t do (past control).</td>
<td>.45</td>
<td>.49</td>
</tr>
<tr>
<td>9. I have control over my day-to-day reactions to this event (present control).</td>
<td>.58</td>
<td>.46</td>
</tr>
<tr>
<td>10. There is nothing I can do to prevent a similar event from happening again (future control, reverse scored).</td>
<td>.38</td>
<td>.39</td>
</tr>
<tr>
<td>11. There isn’t much I can do to keep this event from affecting me (present control, reverse scored).</td>
<td>.36</td>
<td>.36</td>
</tr>
<tr>
<td>12. I didn’t have any control over the event occurring (past control, reverse scored).</td>
<td>.39</td>
<td>.48</td>
</tr>
<tr>
<td>13. I have control over how I think about the event (present control).</td>
<td>.55</td>
<td>.51</td>
</tr>
<tr>
<td>15. I couldn’t have prevented it (past control, reverse scored).</td>
<td>.35</td>
<td>.34</td>
</tr>
<tr>
<td>16. My reaction to the event is not under my control (present control, reverse scored).</td>
<td>.42</td>
<td>.50</td>
</tr>
<tr>
<td>17. There are things I can do to reduce the risk that a similar event will happen again (future control).</td>
<td>.33</td>
<td>.40</td>
</tr>
</tbody>
</table>

Table 6.2 demonstrates that all remaining items, following the removal of item 14, had communalities of .3 or above. Four items (Present Control items 2 and 11; Past Control item 15; and Future Control item 10)
had extraction communalities below .4, which suggested that these were weaker items in terms of the amount of shared variance with the extracted factors. Item 2 was of particular concern as the communality reduced from .42 to .32 following the extraction of factors. Overall, the output indicated that the data were suitable for factor analysis.

### 6.2.2 Principal Axis factor extraction

The method of factor extraction was Principal Axis Factoring. An orthogonal (varimax) rotation was requested as the initial scan of the output revealed very low correlations ($r < .2$) between the factors. Based on the Kaiser criterion (eigenvalues $> 1$), a three-factor solution was evident. The eigenvalues of each factor and the contribution to total variance explained is provided in Table 6.3.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Eigenvalue</th>
<th>% of variance explained</th>
<th>Cumulative % of variance explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4.36</td>
<td>27.27</td>
<td>27.27</td>
</tr>
<tr>
<td>2</td>
<td>3.26</td>
<td>20.38</td>
<td>47.65</td>
</tr>
<tr>
<td>3</td>
<td>1.41</td>
<td>8.82</td>
<td>56.47</td>
</tr>
</tbody>
</table>

($N = 196$)

The results showed that the three-factor model explained 56.5% of the variance. The next step was to interpret the three-factor solution. As an orthogonal (varimax) rotation was performed, the interpretation was based upon the rotated factor matrix, provided in Table 6.4.

As shown in Table 6.4 the three-factor solution produced by the EFA contained the Present Control subscale items on Factor 1, the Past Control subscale items and the reverse-worded Future Control item on Factor 2, and the two remaining Future Control items on Factor 3. Indicative of sound discriminant validity between the factors, the structure was relatively clear. Only two items (items 6 and 8) produced loadings above .30
on more than one factor, and even with these items there was a factor loading that was noticeably higher than the other.

Table 6.4

*Rotated Factor Matrix for Principal Axis Factoring Extraction with Varimax Rotation with the EFA dataset*

<table>
<thead>
<tr>
<th>Item (PCOSES subscale)</th>
<th>Rotated factor matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. When I am upset about this event, I can usually find a way to feel better (present control).</td>
<td>.76</td>
</tr>
<tr>
<td>13. I have control over how I think about the event (present control).</td>
<td>.66</td>
</tr>
<tr>
<td>16. My reaction to the event is not under my control (present control reverse scored).</td>
<td>.66</td>
</tr>
<tr>
<td>9. I have control over my day-to-day reactions to this event (present control).</td>
<td>.63</td>
</tr>
<tr>
<td>5. I don’t have much control over my emotional reactions to this event (present control reverse scored).</td>
<td>.63</td>
</tr>
<tr>
<td>3. How I deal with the event now is under my control (present control).</td>
<td>.63</td>
</tr>
<tr>
<td>11. There isn’t much I can do to keep this event from affecting me (present control reverse scored).</td>
<td>.57</td>
</tr>
<tr>
<td>2. There isn’t much I can do to help myself feel better about the event (present control reverse scored).</td>
<td>.56</td>
</tr>
<tr>
<td>4. There is nothing I could have done to prevent this event from occurring (past control reverse-scored).</td>
<td>.76</td>
</tr>
<tr>
<td>1. I could have done something to prevent this event from happening (past control).</td>
<td>.68</td>
</tr>
<tr>
<td>12. I didn’t have any control over the event occurring (past control reverse-scored).</td>
<td>.68</td>
</tr>
<tr>
<td>8. This event happened because of something I did or didn’t do (past control).</td>
<td>-.30 .57</td>
</tr>
<tr>
<td>15. I couldn’t have prevented it (past control reverse-scored).</td>
<td>.57</td>
</tr>
<tr>
<td>10. There is nothing I can do to prevent a similar event from happening again (future control reverse-scored).</td>
<td>.54</td>
</tr>
<tr>
<td>6. I can do things to make sure I will not experience a similar event in the future (future control).</td>
<td>.31 .59</td>
</tr>
<tr>
<td>17. There are things I can do to reduce the risk that a similar event will happen again (future control).</td>
<td>.56</td>
</tr>
</tbody>
</table>

*Note. Only factor loadings ± .30 are shown for ease of interpretation. (N = 196)*

In addition to these double-loading items, there was also concern regarding the legitimacy of Factor 3. This factor had only two items, both
with relatively low factor loadings, and one of these (item 6) also had a loading above .30 on Factor 2. According to Brown (2006), factors with two or three items are often poorly determined and unstable in their replication across samples of further factors analyses (i.e., CFA). That said, Brown also notes that the interpretability of the factor is important, with the most problematic factors those that are difficult to interpret and that have very few items. In the current analysis Factor 3 had only two items; however it was interpretable within the temporal model of perceived control theory as both items were from the Future Control subscale and are hypothesised to load together.

To further explore the necessity of Factor 3, an EFA with a forced two-factor structure was run. The output showed that items 6 and 17 (the Factor 3 items) produced extraction communalities below .30 and factor loadings below .50 on Factor 2. Therefore, it was decided that Factor 3 should be retained for the next stage of analysis.

The final area for concern was the reproduced correlation residual matrix. This matrix is calculated by subtracting the observed correlation matrix values from the reproduced correlation matrix values. According to Cunningham (2008), values > .05 are considered problematic and suggest issues with the modelling of the relationship between items. The three-factor solution produced 26% of reproduced correlation residuals above .05, with item 9 producing 7 values above the cut-off and items 1 and 2 producing 6 values above the cut-off. While there is not a criterion to determine how many of these above cut-off values are permissible, the reproduced correlation residuals assist interpretation by designating items that are the least well represented by the factor solution. It may be that the relatively small sample size \(n = 196\) contributed to an increased number of residual values above .05.

### 6.2.3 Summary of the Exploratory Factor Analysis

The EFA, conducted using Principal Axis Factoring, produced a three-factor solution
that was broadly consistent with the structure of the PCOSES. Investigation of the factorability of the data indicated that it was suitable for analysis, with the exception of item 14, which was removed from the analysis.

Factor 1 corresponded with the Present Control subscale of the PCOSES. Factors 2 and 3 were less clear-cut with a possible method effect (Brown, 2006) operating for the Future Control items based on whether they were reverse-worded or not. The reverse-worded item loaded on Factor 2, which otherwise contained Past Control subscale items, and the remaining non-reverse-worded items loaded on Factor 3.

Three areas of concern with the EFA output were identified: (1) the presence of two double-loading items (items that had loadings above .30 on two factors); (2) the two-item structure of Factor 3; and (3) the proportion of reproduced correlation residuals above .05. While these issues urge caution for the interpretation and generalisability of the EFA findings, they did not preclude further analysis. The following section outlines the CFA, conducted in two stages: (1) model calibration; and (2) model validation. The CFA was based on the three-factor EFA solution.

6.3 Confirmatory Factor Analysis of the Perceived Control over Stressful Events Scale.

Unlike EFA, where factors are extracted based on the data itself, CFA allows the researcher to specify the hypothesised structure of the measure and test the level of fit (using chi-squared and goodness-of-fit tests) between the theorised model and the observed data (Brown, 2006). Confirmatory Factor Analysis also provides additional information, through standardised residual covariances (S.R.C.) and modification indices (M.I.), about how each of the items contributes towards fit. These statistics inform the refinement of the model to improve measurement accuracy. As outlined in Chapter Five, Section 5.4.3, the CFA involved two steps: (1) calibration of the measurement model; and (2) validation of this model using a separate sample.
6.3.1 Model calibration using single- and multi-factor models.

The calibration of the measurement model involved an approach in which the model was evaluated and refined across several stages. For latent constructs with three or more items (Factors 1 and 2 from the EFA) a single-factor (congeneric) model was run. Factor 3 was tested using the complete multi-factor model that included Factors 1 and 2. This section outlines the data analysis process employed across all Confirmatory Factor Analyses (section 6.3.1.1) and also reports the findings of the congeneric and multi-factor models using both the calibration and validation datasets (sections 6.3.1.2-4).

6.3.1.1 Overview of the model evaluation and refinement process.

Three areas were considered in the assessment of the congeneric and multi-factor models: (1) model fit (see Figure 6.1 for an outline of the process); (2) the degree to which items explained variance in the latent construct (squared multiple correlation values); and (3) theoretical concerns (e.g., was the refinement indicated by statistical data consistent with the study’s theoretical framework).

Three pieces of data critical to the evaluation of model fit are included in Figure 6.1: (1) global fit indices; (2) standardised residual covariances (S.R.C.); and (3) modification indices (M.I.). These indicators are elaborated upon below.

Global fit indices estimate how well the observed data fits the designated CFA model. The simplest indicator of fit is the model chi-square ($\chi^2$) statistic and the associated $p$ value, with adequate fit denoted by $p > .05$. However, for reasons that are widely documented in the literature (e.g., Brown, 2006; Byrne, 2010; Kline, 2010), using chi-square as the sole determinant of model fit is problematic. Therefore, a range of additional fit indices have been developed. Brown recommends that researchers approach fit from several different angles, using fit statistics from each of three
categories: absolute fit indices, fit adjusting for model parsimony, and comparative fit indices (also known as incremental fit indices).

Figure 6.1. Summary of the evaluation process for the Perceived Control Over Stressful Events Scale measurement model.

The statistics selected for the current study are: chi-square ($\chi^2$), normed chi-square ($\chi^2$/df), the Root Mean Square Error of Approximation
An in-depth description of each fit statistic is beyond the scope of the current thesis; however it is important to describe the criteria utilised for assessing fit. Three classifications were established: adequate, marginal and poor. These terms are defined in Table 6.5.

### Table 6.5

**Definitions for the Classification of Model Fit in the Current Study**

<table>
<thead>
<tr>
<th>Classification</th>
<th>$\chi^2$/df</th>
<th>RMSEA</th>
<th>GFI</th>
<th>CFI</th>
<th>TLI</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adequate</td>
<td>1 – 2</td>
<td>$\leq .06$</td>
<td>$\geq .95$</td>
<td>$\geq .95$</td>
<td>$\geq .95$</td>
<td>$\leq .05$</td>
</tr>
<tr>
<td>Marginal</td>
<td>2 – 3</td>
<td>$0.07 – .08$</td>
<td>$0.90 – .94$</td>
<td>$0.90 – .94$</td>
<td>$0.90 – .94$</td>
<td>$0.06 – .08$</td>
</tr>
<tr>
<td>Poor</td>
<td>$&gt; 3$</td>
<td>$&gt; .08$</td>
<td>$&lt; .90$</td>
<td>$&lt; .90$</td>
<td>$&lt; .90$</td>
<td>$&gt; .08$</td>
</tr>
</tbody>
</table>

*Notes: $\chi^2$/df = Normed chi-square; RMSEA = Root Mean Square Error of Approximation; GFI = Goodness of Fit Index; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Standardised Root Mean Square Residual.

* Cut-off scores based on recommendations from Hu & Bentler (1999); Brown (2006); Byrne (2010).*

An over-arching consideration in the assessment of model fit was the relatively small sample size for CFA and the exploratory nature of the study. As discussed previously, the study used a recently established measure, the PCOSES, in a new context (i.e., an imagined traumatic event). This contributed to the selection of fairly flexible and lenient criteria and the acceptance of models with fit statistics within the “marginal” classification. This more flexible approach is also based on the notion that “golden rules” for fit are illusive and a range of information needs to be considered when assessing the adequacy of the model (see Kline, 2010, for a discussion of this issue).
As a complement to the global indicators of fit, S.R.C. and M.I. values provided information on localised sources of model mis-specification. According to Brown (2006), these values are beneficial in refining a relatively well-fitting model – they are less useful if the model is grossly mis-specified. Standardised Residual Covariances are indicators of the degree to which the fitted residuals differ from the residual values of a perfectly fitting model (Brown). For the current study a cut-off value of 2.58 (representative of a statistically significant $z$ score at $p < .01$) was employed, although all S.R.C. values over 2 were inspected. Modification indices provide approximations of the amount by which $\chi^2$ would decrease if the parameter were freely estimated (i.e., permitted to load onto any of the other parameters). The critical value often utilised for M.I. is 4 as this suggests that the model could be significantly improved if the parameter were freely estimated (Brown, 2006). In the current study the top 3 M.I. are inspected in the congeneric models and M.I. above 10 are considered for the multi-factor model.

In terms of the other two areas of model evaluation, i.e., how well the items explain variance in the latent construct and theoretical considerations, specific criteria were not established. This was because there is an absence in the literature of clear cut-off scores for the required amount of variance explained and the impossibility of having a theoretical “cut-off”. Consideration of how well the items explained the latent construct involved inspection of the squared multiple correlation data. In terms of theoretical considerations, any refinement to the model needed a clear theoretical rationale and could not be performed on statistical data alone. The exception to this was if an item appeared grossly problematic. This was defined as an item that performed badly (e.g., S.R.C. $> 2.58$ and/or M.I. $> 4$ and/or low squared multiple correlation values) across all forms of analysis (i.e., across the EFA, calibration CFA and the validation CFA), with the model fit substantially improved with the item’s removal.
6.3.1.2 Congeneric model for Factor 1 – Present Control. The EFA found that all eight of the present control subscale items from the PCOSES had their highest loading on Factor 1. This factor was further tested using a congeneric (one-factor) model, outlined in Figure 6.2. The reverse-worded items are denoted using bold typeface.

Figure 6.2. Starting point for the Present Control congeneric model.

This model was specified in AMOS version 19 and a Maximum Likelihood CFA was requested. The standardised regression weights ranged from .53 (item 3) to .64 (item 13) and the squared multiple correlations ranged from .28 (item 3) to .41 (item 13). Item 13 explained the most variance in Present Control, followed closely by items 7 and 16 (which both had squared multiple correlation values of .39). The significance test of the regression weights found that all were statistically significant ($p < .001$).

Inspection of chi-square revealed problems with model fit: $\chi^2 (20) = 53.93$, $p < .01$. The additional fit statistics are provided in Table 6.6.
Table 6.6

*Fit Statistics for the Present Control Congeneric Model*

<table>
<thead>
<tr>
<th>Fit Statistic</th>
<th>$\chi^2$/df</th>
<th>RMSEA</th>
<th>GFI</th>
<th>CFI</th>
<th>TLI</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>2.70</td>
<td>.09</td>
<td>.93</td>
<td>.91</td>
<td>.87</td>
<td>.06</td>
</tr>
<tr>
<td>Classification</td>
<td>Marginal</td>
<td>Poor</td>
<td>Marginal</td>
<td>Marginal</td>
<td>Poor</td>
<td>Marginal</td>
</tr>
</tbody>
</table>

*Notes:* $\chi^2$/df = Normed chi-square; RMSEA = Root Mean Square Error of Approximation; GFI = Goodness of Fit Index; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Standardised Root Mean Square Residual. ($N = 197$).

The fit statistics for the Present Control congreneric model ranged from poor (RMSEA, TLI) to marginal ($\chi^2$/df, GFI, CFI, SRMR). These indicators suggested that problems existed within the specification of the model. Table 6.7 outlines the indicators of mis-specification: the S.R.C. and the M.I.

Table 6.7

*Present Control Model Evaluation – Calibration Dataset*

<table>
<thead>
<tr>
<th>Description</th>
<th>Relevant Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspect standardised residual covariances (S.R.C.)</td>
<td>All below cut-off value (2.58). One value (between items 3 &amp; 13) over 2 (2.04).</td>
</tr>
<tr>
<td>Inspect modification indices (M.I.)</td>
<td>Three highest covariance M.I.:</td>
</tr>
<tr>
<td>• Covarying e3 &amp; e13 (13.25)</td>
<td></td>
</tr>
<tr>
<td>• Covarying e5 &amp; e13 (6.89)</td>
<td></td>
</tr>
<tr>
<td>• Covarying e5 &amp; e16 (6.40)</td>
<td></td>
</tr>
</tbody>
</table>

The data presented in Table 6.7 demonstrate that while the regression weights and S.R.C. were within the designated criteria, the M.I. pointed towards fit being improved with the covariance of error terms between item 13 and 3, item 13 and 5 and item 5 and 16. Given an absence
of theoretical rationale for covarying the error terms, item removal was considered. Item 13 appeared the most problematic as it was associated with the highest S.R.C. value and the highest M.I. values, however, the standardised regression weights and squared multiple correlations data indicated that this item was the strongest predictor of Present Control. Item 3, on the other hand, was the weakest in this regard.

As discussed in section 6.3.1.1, item removal could not be based on statistical data alone, unless the item appeared grossly mis-specified. Therefore, the item content was examined to assess possible theoretical reasons for mis-specification. From this standpoint, item 13 appeared conceptually distinct from the other items as the only one to make explicit reference to control over thoughts. The other items referred to control over emotional reactions (e.g., items 2, 5 & 7) or the recovery process more generally (e.g., items 3, 9, 11 & 16). It is possible that control over thoughts was considered by participants as distinct, and thus generated a different pattern of response. To test whether the model was substantially improved without this item, the data were re-analysed with item 13 removed. The chi-square value was reduced considerably: $\chi^2 (14) = 23.41, p = .05$. The remaining fit indicators are presented in Table 6.8.

Table 6.8

*Fit Statistics for the Present Control Congeneric Model Without Item 13 – Calibration Dataset*

<table>
<thead>
<tr>
<th>Fit Statistic</th>
<th>$\chi^2$/df</th>
<th>RMSEA</th>
<th>GFI</th>
<th>CFI</th>
<th>TLI</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>1.67</td>
<td>.06</td>
<td>.97</td>
<td>.97</td>
<td>.95</td>
<td>.04</td>
</tr>
<tr>
<td>Classification</td>
<td>Adequate</td>
<td>Adequate</td>
<td>Adequate</td>
<td>Adequate</td>
<td>Adequate</td>
<td>Adequate</td>
</tr>
</tbody>
</table>

*Notes: $\chi^2$/df = Normed chi-square; RMSEA = Root Mean Square Error of Approximation; GFI = Goodness of Fit Index; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Standardised Root Mean Square Residual.*

*(N = 197)*
As shown in Table 6.8, the removal of item 13 undoubtedly improved the model fit – all fit statistics are classified as adequate. The impact on the standardised regression weights and squared multiple correlations was more equivocal. While some values (e.g., item 16) increased as a result of the alteration (the squared multiple correlation went from .39 to .42), the values for other items were reduced (e.g., the squared multiple correlation for item 3 went from .28 to .21), meaning that they explained less variance in Present Control in the new model. While this is not ideal, the improvement in fit was so substantial it was difficult to justify retaining item 13 just to bolster the explanatory power of two items. Therefore, the final congeneric model for Present Control did not include item 13 (Figure 6.3).

![PRESENT CONTROL]

2. There isn’t much I can do to help myself feel better about the event.
3. How I deal with the event now is under my control.
5. I don’t have much control over my emotional reactions to this event.
7. When I am upset about this event, I can usually find a way to feel better.
9. I have control over my day-to-day reactions to this event.
11. There isn’t much I can do to keep this event from affecting me.
16. My reaction to the event is not under my control.

Figure 6.3. Final congeneric model for the Present Control construct.

6.3.1.3 Congeneric model for Factor 2. The second congeneric model contained the items aligned with Factor 2 in the EFA. This included all five Past Control subscale items and one Future Control subscale item. The latent construct was labelled Factor 2 at this stage as it did not directly translate to either Past Control or Future Control. This model is provided in Figure 6.4. The reverse-worded items are highlighted using bold typeface. The item from the Future Control subscale of the PCOSES is italicised.
Figure 6.4. Starting point for the Factor 2 congeneric model.

This model was specified in AMOS version 19 and a Maximum Likelihood CFA was requested. The standardised regression weights ranged from .42 (item 10) to .75 (item 4) and the squared multiple correlations ranged from .18 (item 10) to .57 (item 4). The significance test of the regression weights found that all were statistically significant ($p < .001$).

The next step was to look at model fit. In terms of the chi-square statistic, model fit was marginal: $\chi^2 (9) = 20.68, p = .01$. The additional fit statistics are provided in Table 6.9.

Table 6.9

<table>
<thead>
<tr>
<th>Fit Statistic</th>
<th>$\chi^2$/df</th>
<th>RMSEA</th>
<th>GFI</th>
<th>CFI</th>
<th>TLI</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>2.30</td>
<td>.08</td>
<td>.96</td>
<td>.95</td>
<td>.92</td>
<td>.05</td>
</tr>
<tr>
<td>Classification</td>
<td>Marginal</td>
<td>Marginal</td>
<td>Adequate</td>
<td>Adequate</td>
<td>Marginal</td>
<td>Adequate</td>
</tr>
</tbody>
</table>

Notes: $\chi^2$/df = Normed chi-square; RMSEA = Root Mean Square Error of Approximation; GFI = Goodness of Fit Index; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Standardised Root Mean Square Residual. ($N = 197$).

The fit statistics presented in Table 6.9 suggested a reasonable model fit. The GFI, CFI and SRMR indicated adequate fit and the others...
were within the marginal range. To determine whether the model could be
improved, localised areas of mis-specification were examined using the
C.R.C. and M.I. data (Table 6.10).

Table 6.10

_Factor 2 Model Evaluation – Calibration Dataset._

<table>
<thead>
<tr>
<th>Description</th>
<th>Relevant Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspect standardised residual</td>
<td>All below 2.</td>
</tr>
<tr>
<td>covariances (S.R.C.)</td>
<td></td>
</tr>
<tr>
<td>Inspect modification indices (M.I.)</td>
<td>Three highest covariance M.I.:</td>
</tr>
<tr>
<td></td>
<td>• Covarying e10 &amp; e15 (5.86)</td>
</tr>
<tr>
<td></td>
<td>• Covarying e10 &amp; e8 (4.39)</td>
</tr>
<tr>
<td></td>
<td>• Covarying e10 &amp; e1 (4.28)</td>
</tr>
</tbody>
</table>

While all standardised residual covariances were within an
acceptable range, the M.I. indicated that fit could be improved through
allowing the item 10 error term to covary with items 1, 8 and 15. This
information, coupled with the low squared multiple correlation value,
suggested that item 10 was problematic. This statistical information was
consistent with the theoretical basis of the model; item 10 was from the
Future Control subscale whereas the other items were from the Past Control
subscale. Therefore, there were grounds to remove this item from both
statistical and theoretical perspectives. The model was re-analysed without
item 10 and returned a chi square of: $\chi^2 (5) = 5.9, \ p = .32$. The additional fit
statistics are presented in Table 6.11.
Table 6.11

Fit Statistics for the Factor 2 Congeneric Model Without Item 10 –
Calibration Dataset

<table>
<thead>
<tr>
<th>Fit Statistic</th>
<th>$\chi^2$/df</th>
<th>RMSEA</th>
<th>GFI</th>
<th>CFI</th>
<th>TLI</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>1.18</td>
<td>.03</td>
<td>.99</td>
<td>.99</td>
<td>.99</td>
<td>.03</td>
</tr>
</tbody>
</table>

Classification Adequate Adequate Adequate Adequate Adequate Adequate Adequate

Notes: $\chi^2$/df = Normed chi-square; RMSEA = Root Mean Square Error of Approximation;
GFI = Goodness of Fit Index; CFI = Comparative Fit Index; TLI= Tucker-Lewis Index;
SRMR = Standardised Root Mean Square Residual.
(N = 197)

The chi-square value and the data presented in Table 6.11 indicate that the model without item 10 was a very good fit with the observed data. The squared multiple correlation values were relatively unchanged and ranged from .26 (items 15 and 8) to .60 (item 1). Given that only Past Control items remained, the latent construct was labelled “Past Control”.

The final congeneric model is depicted in Figure 6.5.

Figure 6.5. Final congeneric model for the Past Control construct.

6.3.1.4 Evaluation of the complete (three-factor) measurement model. As Factor 3 from the EFA contained only two items, both of which were from the Future Control subscale of the PCOSES, this construct could
not be tested using a single-factor model. Therefore, the Future Control latent construct was assessed using a multi-factorial model that also included Present and Past Control. The testing of the complete model also enabled the correlations between constructs to be considered to establish the discriminant validity of the subscales. The complete three-factor model is depicted in Figure 6.6, with reverse-worded items in bold font.

**Figure 6.6.** Complete measurement model for the Perceived Control Over Stressful Events Scale.
This model was specified using AMOS version 19 and a Maximum Likelihood CFA was requested. The covariances, and their associated $p$ value, for the latent constructs are presented in Table 6.12.

Table 6.12

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Covariance</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present Control ↔ Past Control</td>
<td>.06</td>
<td>.48</td>
</tr>
<tr>
<td>Present Control ↔ Future Control</td>
<td>.25</td>
<td>.01</td>
</tr>
<tr>
<td>Past Control ↔ Future Control</td>
<td>.55</td>
<td>&lt; .001</td>
</tr>
</tbody>
</table>

The information provided in Table 6.12 demonstrated that there was a very weak, non-significant, relationship between the present and past control constructs; a weak, albeit statistically significant, relationship between present and future control; and a moderate, statistically significant, relationship between past and future control. Given these covariances were not particularly high, it could be concluded that the constructs were distinct and that second-order factors (i.e., additional constructs that tie together one or more of the existing factors) were not required. This supported the discriminant validity of the three PCOSES subscales.

The next step of the analysis was to examine the amount of variance explained by each of the items. The standardised regression weights and squared multiple correlations are provided in Table 6.13. The significance test of the regression weights found that all were statistically significant ($p < .001$).

As indicated in Table 6.13, the standardised regression weights and squared multiple correlations for Present and Past Control were the same as for the congeneric models. The two future control items returned values that were relatively high. This indicated that both items explained a reasonable amount of variance in the latent construct.
Table 6.13

*Standardised Regression Weights and Squared Multiple Correlations for the Three-Factor Model - Calibration Dataset.*

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item</th>
<th>Standardised regression weight</th>
<th>Squared multiple correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present Control</td>
<td>2. There isn’t much I can do to help myself feel better about the event.</td>
<td>.59</td>
<td>.35</td>
</tr>
<tr>
<td></td>
<td>3. How I deal with the event now is under my control.</td>
<td>.47</td>
<td>.22</td>
</tr>
<tr>
<td></td>
<td>5. I don’t have much control over my emotional reactions to this event.</td>
<td>.59</td>
<td>.35</td>
</tr>
<tr>
<td></td>
<td>7. When I am upset about this event, I can usually find a way to feel better.</td>
<td>.61</td>
<td>.37</td>
</tr>
<tr>
<td></td>
<td>9. I have control over my day-to-day reactions to this event.</td>
<td>.51</td>
<td>.26</td>
</tr>
<tr>
<td></td>
<td>11. There isn’t much I can do to keep this event from affecting me.</td>
<td>.64</td>
<td>.41</td>
</tr>
<tr>
<td></td>
<td>16. My reaction to the event is not under my control.</td>
<td>.63</td>
<td>.40</td>
</tr>
<tr>
<td>Past Control</td>
<td>1. I could have done something to prevent this event from happening.</td>
<td>.79</td>
<td>.62</td>
</tr>
<tr>
<td></td>
<td>4. There is nothing I could have done to prevent this event from occurring.</td>
<td>.72</td>
<td>.52</td>
</tr>
<tr>
<td></td>
<td>8. This event happened because of something I did or didn’t do.</td>
<td>.51</td>
<td>.26</td>
</tr>
<tr>
<td></td>
<td>12. I didn’t have any control over the event occurring.</td>
<td>.55</td>
<td>.30</td>
</tr>
<tr>
<td></td>
<td>15. I couldn’t have prevented it.</td>
<td>.52</td>
<td>.27</td>
</tr>
<tr>
<td>Future Control</td>
<td>6. I can do things to make sure I will not experience a similar event in the future.</td>
<td>.68</td>
<td>.46</td>
</tr>
<tr>
<td></td>
<td>17. There are things I can do to reduce the risk that a similar event will happen again.</td>
<td>.75</td>
<td>.56</td>
</tr>
</tbody>
</table>

$N = 197.$

With regard to model fit, the chi-square statistic was: $\chi^2 (74) = 148.21, p < .01$. The chi-square value was considerably higher than that produced by the congeneric models, however it not unexpected given the
three-factor model’s additional items and complexity. The associated fit statistics are provided in Table 6.14.

Table 6.14

**Fit Statistics for the Three-Factor Measurement Model – Calibration Dataset.**

<table>
<thead>
<tr>
<th>Fit Statistic</th>
<th>$\chi^2$/df</th>
<th>RMSEA</th>
<th>GFI</th>
<th>CFI</th>
<th>TLI</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>2.00</td>
<td>.07</td>
<td>.90</td>
<td>.88</td>
<td>.86</td>
<td>.07</td>
</tr>
</tbody>
</table>

Classification Adequate Marginal Marginal Poor Poor Marginal

**Notes:** $\chi^2$/df = Normed chi-square; RMSEA = Root Mean Square Error of Approximation; GFI = Goodness of Fit Index; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Standardised Root Mean Square Residual.

The fit statistics included values ranging from poor (CFI, TLI) to adequate ($\chi^2$/df). To identify sources of model mis-specification, the S.R.C. and M.I. values were inspected (Table 6.15).

Table 6.15

**Standardised Residual Covariances and Modification Indices for the Three-Factor Model – Calibration Dataset.**

<table>
<thead>
<tr>
<th>Output type</th>
<th>Relevant statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standardised residual covariances</strong></td>
<td>• Items 7 &amp; 8 (-2.61)</td>
</tr>
<tr>
<td></td>
<td>• Items 11 &amp; 12 (3.66)</td>
</tr>
<tr>
<td><strong>Modification indicies (M.I.)</strong></td>
<td>• e5 ↔ Future Control (18.11)</td>
</tr>
<tr>
<td></td>
<td>• e1 ↔ e2 (14.62)</td>
</tr>
<tr>
<td></td>
<td>• e11 ↔ e12 (11.43)</td>
</tr>
<tr>
<td></td>
<td>• e7 ↔ Future Control (10.73)</td>
</tr>
</tbody>
</table>
The S.R.C. and M.I. data pointed towards an unanticipated source of model mis-specification. These values suggested that most of the “problem areas” were between items that appeared next to each other in the questionnaire (e.g., items 7 & 8, items 11 & 12, items 1 & 2). Therefore, it appeared that model mis-specification was linked to “noise” generated by methodological problems (i.e., response bias caused by the order of items in the questionnaire) rather than theoretically-based concerns with the model itself. This information did not provide a legitimate rationale for adjusting the model, despite the global issues with fit. It was determined that the measurement model would remain unchanged and would be further examined using the validation dataset.

6.3.2 Measurement model validation. To test the integrity of the factor structure of the PCOSES, the one factor models for the Present Control and Past Control constructs were re-run with the validation dataset \((n = 196)\), followed by the complete three-factor model. The results for the one-factor models are presented in section 6.3.2.1; the three-factor model is discussed in section 6.3.2.2.

6.3.2.1 Findings of the one-factor model CFAs – validation dataset. To further validate the one-factor models calibrated in section 6.3.1, CFAs were re-run with the Present Control (see Figure 6.3) and Past Control (see Figure 6.5) constructs utilising the validation dataset. The results of both analyses found that all regression weights were statistically significant \((p < .001)\). The fit statistics for these models are presented in Table 6.16. The fit statistics from the CFAs with the calibration dataset are also provided to enable comparison.

In addition to the fit statistics provided in Table 6.16 it was also necessary to consider the chi-square values for each model. The chi-square value for the Present Control model with the calibration dataset was: \(\chi^2 (14) = 23.41, p = .05\). For same model run with the validation dataset it was: \(\chi^2 (14) = 62.15, p < .01\).
Table 6.16

Fit Statistics for the Present Control and Past Control Congeneric Models – Validation Dataset

<table>
<thead>
<tr>
<th>Construct</th>
<th>Fit Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\chi^2$/df</td>
</tr>
<tr>
<td>Pres. Con. Calibration</td>
<td></td>
</tr>
<tr>
<td>Value</td>
<td>1.67</td>
</tr>
<tr>
<td>Classification</td>
<td>Adequate</td>
</tr>
<tr>
<td>Pres. Con. Validation</td>
<td></td>
</tr>
<tr>
<td>Value</td>
<td>4.44</td>
</tr>
<tr>
<td>Classification</td>
<td>Poor</td>
</tr>
<tr>
<td>Past Con. Calibration</td>
<td></td>
</tr>
<tr>
<td>Value</td>
<td>1.18</td>
</tr>
<tr>
<td>Classification</td>
<td>Adequate</td>
</tr>
<tr>
<td>Past Con. Validation</td>
<td></td>
</tr>
<tr>
<td>Value</td>
<td>2.42</td>
</tr>
<tr>
<td>Classification</td>
<td>Marginal</td>
</tr>
</tbody>
</table>

Notes: Pres. Con. = Present Control; Past Con. = Past Control. $\chi^2$/df = Normed chi-square; RMSEA = Root Mean Square Error of Approximation; GFI = Goodness of Fit Index; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Standardised Root Mean Square Residual. ($N = 196$)

The chi-square value for the Past Control model with the calibration dataset was: $\chi^2 (5) = 5.9, p = .32$. For the validation dataset the chi-square value was: $\chi^2 (5) = 12.11, p = .03$. While it was not surprising that the model fit was poorer with the validation dataset than the calibration dataset, the extent of the deterioration for the Present Control model was problematic and required further examination. For the Past Control construct the fit remained acceptable, although the RMSEA value within the poor classification was a concern. To identify localised sources of model mis-specification for the Present Control model the SRCs and MIs were inspected. This information is provided in Table 6.17.
Table 6.17

*Present Control Model Evaluation – Validation Dataset.*

<table>
<thead>
<tr>
<th>Description</th>
<th>Relevant Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspect standardised residual covariances (S.R.C.)</td>
<td>No values above cut-off (2.58)</td>
</tr>
<tr>
<td></td>
<td>One value over 2:</td>
</tr>
<tr>
<td></td>
<td>• Items 5 &amp; 11 (2.23)</td>
</tr>
<tr>
<td></td>
<td>Three highest covariance M.I.:</td>
</tr>
<tr>
<td>Inspect modification indicies (M.I.)</td>
<td>• e5 ↔ e11 (26.60)</td>
</tr>
<tr>
<td></td>
<td>• e3 ↔ e9 (9.97)</td>
</tr>
<tr>
<td></td>
<td>• e7 ↔ e9 (7.92)</td>
</tr>
</tbody>
</table>

The information provided by the SRCs and MIs indicated that the relationship between items 5 (“I don’t have much control over my emotional reactions to this event”) and 11 (“There isn’t much I can do to keep this event from affecting me”) was a source of model misspecification. The MI in particular was strongly indicating that model fit would be greatly improved by allowing the error terms to covary.

Given that both items were reverse-worded, it is possible that this analysis identified a “method effect” whereby the model fit was impacted by the way participants responded to items due to their wording, rather than a clear distinction between the construct that these words represented and that measured by the other items. This does not provide a theoretical rationale for changing the measurement model, and in subsequent regression analyses (Chapter Seven) it was not possible to covary the items’ error terms. Therefore, item deletion in order to improve model fit was considered. Looking back at the findings from the analyses with the calibration dataset found that the error term for item five had emerged twice in the M.I. for the congeneric model and also in the three-factor model.
where a covariance with Future Control was suggested. This indicated that item 5 was a relatively poor performer according to statistical criteria across all analyses. It was decided to re-run the CFA for the Present Control congeneric model using the calibration dataset without item 5.

The results of this CFA indicated that model fit was substantially improved. The chi-square statistic for this model was: $\chi^2 (9) = 21.15, p = .01$. While this does not meet the requirements of an adequate fit, the chi-square value was reduced by over 50%. All of the fit statistics were within the marginal ($\chi^2$/df, TLI, RMSEA) or adequate (GFI, CFI, SRMR) classification. Given the magnitude of this improvement in model fit, and the implications for subsequent analyses of a poorly fitting model, it was decided to retain this adjustment for the Present Control construct.

To summarise the results of the one-factor measurement model CFAs, it was found that, although some deterioration was observed, the Past Control construct retained an adequate fit with the observed data. For the Present Control construct the model was a poor fit with the validation dataset, however the deletion of item 5 greatly improved fit to within an acceptable range. The Future Control section of the model remained unchanged.

6.3.2.2 Findings of the three-factor model validation CFA. The three-factor measurement model (see Figure 6.5), without item 5, was entered into in AMOS version 19 and a Maximum Likelihood CFA using the validation dataset was requested. The standardised regression weights (S.R.W.) and squared multiple correlations (S.M.C.) are provided in Table 6.18 alongside the values for the calibration CFA to enable comparison. Reverse-worded items are in bold font. As with previous analyses, the significance test of the regression weights found that all were statistically significant ($p < .001$).
Table 6.18

Comparison of the Standardised Regression Weights and Squared Multiple Correlations for the Three-Factor Model Across the Calibration and Validation Datasets

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Item</th>
<th>Calibration dataset</th>
<th>Validation dataset</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>S.R.W.</td>
<td>S.M.C.</td>
</tr>
<tr>
<td>Present Control</td>
<td>2. There isn’t much I can do to help myself feel better about the event.</td>
<td>.59</td>
<td>.35</td>
</tr>
<tr>
<td></td>
<td>3. How I deal with the event now is under my control.</td>
<td>.47</td>
<td>.22</td>
</tr>
<tr>
<td></td>
<td>5. I don’t have much control over my emotional reactions to this event.*</td>
<td>.59</td>
<td>.35</td>
</tr>
<tr>
<td></td>
<td>7. When I am upset about this event, I can usually find a way to feel better.</td>
<td>.61</td>
<td>.37</td>
</tr>
<tr>
<td></td>
<td>9. I have control over my day-to-day reactions to this event.</td>
<td>.51</td>
<td>.26</td>
</tr>
<tr>
<td></td>
<td>11. There isn’t much I can do to keep this event from affecting me.</td>
<td>.64</td>
<td>.41</td>
</tr>
<tr>
<td></td>
<td>16. My reaction to the event is not under my control.</td>
<td>.63</td>
<td>.40</td>
</tr>
<tr>
<td>Past Control</td>
<td>1. I could have done something to prevent this event from happening.</td>
<td>.79</td>
<td>.62</td>
</tr>
<tr>
<td></td>
<td>4. There is nothing I could have done to prevent this event from occurring.</td>
<td>.72</td>
<td>.52</td>
</tr>
<tr>
<td></td>
<td>8. This event happened because of something I did or didn’t do.</td>
<td>.51</td>
<td>.26</td>
</tr>
<tr>
<td></td>
<td>12. I didn’t have any control over the event occurring.</td>
<td>.55</td>
<td>.30</td>
</tr>
<tr>
<td></td>
<td>15. I couldn’t have prevented it.</td>
<td>.52</td>
<td>.27</td>
</tr>
<tr>
<td>Future Control</td>
<td>6. I can do things to make sure I will not experience a similar event in the future.</td>
<td>.68</td>
<td>.46</td>
</tr>
<tr>
<td></td>
<td>17. There are things I can do to reduce the risk that a similar event will happen again.</td>
<td>.75</td>
<td>.56</td>
</tr>
</tbody>
</table>

Note: S.R.W. = Standardised Regression Weight; S.M.C. = Squared Multiple Correlation.
* Item 5 was deleted in the CFA for the validation dataset.

The pattern of results presented in Table 6.18 depicts varying levels of consistency in the S.R.W. and S.M.C. values across the analyses. The Past Control subscale recorded some considerable changes in the values.
themselves (e.g., item 8’s S.R.W. increased from .51 to .75). For the Present Control subscale there were some key differences between the datasets. Item 11 had the highest values in the calibration dataset, whereas for the validation dataset item 7 had increased by .18 to become the highest value. Item 9 also demonstrated a large change, increasing from .51 in the calibration CFA to .71 in the validation CFA. The lowest value also changed across the two datasets, from item 3 to item 2. Finally, for the Future Control subscale the order of the items swapped from one dataset to the other. Both items retained S.R.W. values above .60, however.

Next, the global fit statistics were examined. The chi-square value was only slightly higher than that of the calibration dataset analysis. For the validation dataset the chi-square was: $\chi^2 (62) = 135.23, p < .01$; for the calibration dataset it was: $\chi^2 (74) = 148.21, p < .01$. Both chi-square values are well above the value that would indicate adequate fit, however this is to be expected with the added complexity in the model. The remaining fit indices are provided in Table 6.19. As with Table 6.18, the statistics from the calibration dataset are provided for comparison.

Table 6.19 illustrates that the fit statistics for the validation dataset were largely consistent with those obtained for the calibration dataset. While it is important to note that the models differed slightly (item 5 was deleted in the validation dataset model), the model performed in a similar way with the observed data across both samples. Given that the model fit was not ideal, the indicators of model mis-specification (SRCs and MIs) were inspected and compared across both datasets to identify any items that performed poorly in both analyses. These results are provided in Table 6.20.
Table 6.19

*Fit Statistics for the Three-Factor Measurement Model – Validation and Calibration Datasets*

<table>
<thead>
<tr>
<th>Fit Statistic</th>
<th>Validation dataset</th>
<th>Calibration dataset</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Value</td>
<td>Value</td>
</tr>
<tr>
<td>(\chi^2/df)</td>
<td>2.18</td>
<td>2.00</td>
</tr>
<tr>
<td>RMSEA</td>
<td>.08</td>
<td>.07</td>
</tr>
<tr>
<td>GFI</td>
<td>.91</td>
<td>.90</td>
</tr>
<tr>
<td>CFI</td>
<td>.90</td>
<td>.88</td>
</tr>
<tr>
<td>TLI</td>
<td>.88</td>
<td>.86</td>
</tr>
<tr>
<td>SRMR</td>
<td>.08</td>
<td>.07</td>
</tr>
<tr>
<td>Classification</td>
<td>Marginal</td>
<td>Adequate</td>
</tr>
</tbody>
</table>

*Note. \(\chi^2/df\) = Normed chi-square; RMSEA = Root Mean Square Error of Approximation; GFI = Goodness of Fit Index; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Standardised Root Mean Square Residual.*

Table 6.20 shows that the comparison of SRC and MI values across both dataset analyses highlighted only one similarity – the relationship between items 11 and 12 was not adequately captured in either model. Item 12 was particularly problematic in the validation dataset analysis – it also had SRC values above the cut-off score with item 16, which was further reflected in a suggested covariance with the Present Control construct. From a theoretical perspective it is difficult to see where there is common ground between this Past Control item (“I didn’t have any control over the event occurring”) and the Present Control items. While item 12 had performed well in the EFA (a factor loading of .68 on Factor 2), the squared multiple correlation values from both CFAs (Table 6.18) indicated that the Past Control construct did not explain a substantial amount of variance in this item.
Table 6.20

*Standardised Residual Covariances and Modification Indicies for the Three-Factor model – Comparison Between the Calibration and Validation Datasets*

<table>
<thead>
<tr>
<th>Output type</th>
<th>Relevant statistics</th>
<th>Relevant statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Calibration dataset</td>
<td>Validation dataset</td>
</tr>
<tr>
<td></td>
<td>Values above cut-off (2.58):</td>
<td>Values above cut-off (2.58):</td>
</tr>
<tr>
<td>Standardised residual covariances</td>
<td>• Items 7 &amp; 8 (-2.61)</td>
<td>• Items 12 &amp; 16 (2.92)</td>
</tr>
<tr>
<td></td>
<td>• Items 11 &amp; 12 (3.66)</td>
<td>• Items 11 &amp; 12 (3.92)</td>
</tr>
<tr>
<td>Modification indicies</td>
<td>Covariance M.I. above 10:</td>
<td>Covariance M.I. above 10:</td>
</tr>
<tr>
<td></td>
<td>• e5 ← Future Control (18.11)</td>
<td>• e12 ← Present Control (10.36)</td>
</tr>
<tr>
<td></td>
<td>• e1 ← e2 (14.62)</td>
<td>• e12 ← e11 (11.86)</td>
</tr>
<tr>
<td></td>
<td>• e11 ← e12 (11.43)</td>
<td>• e2 ← e6 (10.18)</td>
</tr>
<tr>
<td></td>
<td>• e7 ← Future Control (10.73)</td>
<td></td>
</tr>
</tbody>
</table>

With these issues in mind, it was decided to remove item 12 a re-run the three-factor model with the validation dataset. The analysis returned a chi-square statistic of \( \chi^2 (51) = 99.54, p < .01 \). The other fit statistics are provided in Table 6.21.

The findings presented in Table 6.21 indicated that fit is minimally improved with the deletion of item 12. Most fit statistics remained within the same classification. This does not provide a compelling case for the removal of this item – especially given the absence of a theoretical rationale. Therefore it was determined that item 12 should be retained for subsequent analyses.
Table 6.21

Fit Statistics for the Three-Factor Measurement Model Without Item 12 – Validation Datasets

<table>
<thead>
<tr>
<th>Fit Statistic</th>
<th>$\chi^2$/df</th>
<th>RMSEA</th>
<th>GFI</th>
<th>CFI</th>
<th>TLI</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>2.00</td>
<td>.07</td>
<td>.93</td>
<td>.93</td>
<td>.91</td>
<td>.07</td>
</tr>
<tr>
<td>Classification</td>
<td>Adequate</td>
<td>Marginal</td>
<td>Marginal</td>
<td>Marginal</td>
<td>Marginal</td>
<td>Marginal</td>
</tr>
</tbody>
</table>

*Note. $\chi^2$/df = Normed chi-square; RMSEA = Root Mean Square Error of Approximation; GFI = Goodness of Fit Index; CFI = Comparative Fit Index; TLI= Tucker-Lewis Index; SRMR = Standardised Root Mean Square Residual.*

6.4 Chapter Summary

This chapter has detailed the findings of factor analyses of the PCOSES, the measure of the TMPC. To begin, an EFA was conducted to establish that the measure produced the expected three-factor structure when applied to the new context – that of an imagined traumatic event. The EFA returned a three-factor solution, although item 14 from the Future Control subscale was removed and some issues were identified with the output; most concerning of these was perhaps the two-item structure of Factor 3. It was determined that these issues did not preclude the running of the CFAs.

The next stage of analysis utilised CFA for the calibration and validation of one-factor (congeneric) and three-factor (complete) measurement models. Testing the measurement models over two datasets protected against interpretation being biased by the vagaries of the particular sample used; the resultant measurement model is more robust. Over the course of the analyses three alterations were made to the measurement model.

First, item 13 was removed from the Present Control subscale due to issues with fit. Also, this was the only item to mention control over thoughts. It was decided that this difference in item content may have elicited different responses by participants. Second, item 10 was removed
from Factor 2 (later labelled Past Control). In addition to causing issues with model fit, this item was from a different subscale than the other items. This provided a clear theoretical rationale for its removal.

Finally, item 5 from the Present Control subscale was deleted. In this instance the theoretical justification was not strong, however the improvement in model fit was considerable. It was determined that, given the need to use the PCOSES further in stage two of analysis (Chapter Seven), improving fit was important for enhancing subsequent analyses.

The final 13-item measure was utilised in stage two of data analysis. This stage involved examining the relationships between temporal control orientations and individual characteristics. These analyses are reported in Chapter Seven.
Chapter Seven: Data Analysis Stage Two – Analysis of Relationships Among Variables.

7.1 Introduction

The focus of the second stage of data analysis was on the relationships among the temporal control orientations (referred to in this chapter as *temporal orientations*) and the individual characteristics. The purpose of this stage was to explore how participants’ responses to the imagined traumatic event connected to other attributes (e.g., psychological distress, personality characteristics, demographic variables). These analyses addressed Research Questions 2, 3 and 4 (see Table 7.1).

Table 7.1

*Research Questions Addressed in Stage Two of Data Analysis*

<table>
<thead>
<tr>
<th>Number</th>
<th>Research Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ2</td>
<td>What is the nature of the relationships between the temporal control orientations and other individual characteristics?</td>
</tr>
<tr>
<td>RQ3</td>
<td>Do any of the individual characteristics uniquely predict the present, past or future control orientations?</td>
</tr>
<tr>
<td>RQ4</td>
<td>How do the relationships identified between temporal control orientations and the individual characteristics compare to the adaptiveness of these variables suggested by risk factor research?</td>
</tr>
</tbody>
</table>

The analyses reported in this chapter were conducted using the entire sample (N = 589) and took place in two steps. First, preliminary analyses were performed to determine which variables exhibited a statistically significant relationship with the temporal orientations. A bivariate regression analysis was run for the continuous variables. T-tests were conducted with the categorical variables (e.g., gender, psychological distress, previous traumatic experience), with the cut-off point for statistical significance adjusted to account for the increased risk of Type I errors due
to the number of tests run. Section 7.2 describes the re-coding of some variables prior to analysis, to improve their compliance with the assumptions of regression, and the descriptive statistics for all variables used in the analyses.

Second, multivariate regression analyses were conducted. The Independent Variables (IV) were those characteristics that had exhibited a statistically significant relationship with the temporal orientations (the dependent variables; DV) in the preliminary analyses. The regression analyses, discussed in section 7.3, highlight the unique predictors and amount of variance explained in the DV by the IVs.

### 7.2 Descriptive statistics and preliminary analyses

The descriptive statistics were divided into two groups depending on the nature of the variables (i.e., continuous or categorical). The continuous variables included: the temporal orientations, Neuroticism, adult attachment types (Ambivalent and Avoidant), Optimism and Extraversion. The categorical variables comprised: the demographic variables (gender, age, country of origin); general psychological distress (clinical or non-clinical groups based on the Depression, Anxiety and Stress Scale scores); and traumatic distress. A correlational analysis was run using the continuous variables. A series of independent samples t-tests were run with the categorical variables. The results of the analyses are summarised in Section 7.2.3.

#### 7.2.1 Descriptive statistics for the continuous variables

The descriptive statistics for the continuous variables are provided in Table 7.2. These indicate that the reliability of the scales was sound, with the exception of the Future Control scale (α = .66). This lower alpha coefficient is likely related to the two-item nature of the scale and was kept in mind in the interpretation of subsequent findings.
Table 7.2
Descriptive Statistics for the Continuous Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>M (SD)</th>
<th>Theorised Range</th>
<th>Observed Range</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporal Orientations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present Control</td>
<td>16.76</td>
<td>6-24</td>
<td>6-24</td>
<td>.78</td>
</tr>
<tr>
<td></td>
<td>(3.67)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Past Control</td>
<td>11.58</td>
<td>5 - 20</td>
<td>5 - 20</td>
<td>.78</td>
</tr>
<tr>
<td></td>
<td>(3.47)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Future Control</td>
<td>6.11</td>
<td>2 - 8</td>
<td>2 - 8</td>
<td>.66</td>
</tr>
<tr>
<td></td>
<td>(1.40)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual Characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neuroticism</td>
<td>27.67</td>
<td>10 - 50</td>
<td>10 - 48</td>
<td>.87</td>
</tr>
<tr>
<td></td>
<td>(8.03)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoidant Attachment Type</td>
<td>17.08</td>
<td>6 - 42</td>
<td>6 - 40</td>
<td>.83</td>
</tr>
<tr>
<td></td>
<td>(7.64)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambivalent Attachment Type</td>
<td>22.74</td>
<td>6 - 42</td>
<td>6 - 41</td>
<td>.76</td>
</tr>
<tr>
<td></td>
<td>(7.58)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dispositional Optimism</td>
<td>13.74</td>
<td>0 - 24</td>
<td>0 - 24</td>
<td>.84</td>
</tr>
<tr>
<td></td>
<td>(4.81)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extraversion</td>
<td>32.26</td>
<td>10 - 50</td>
<td>12 - 49</td>
<td>.85</td>
</tr>
<tr>
<td></td>
<td>(7.16)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N = 589.

To enable direct comparison between the mean scores for the temporal orientations, the observed means were divided by the number of items in each scale. The highest possible mean score was four (participants responded on a four-point Likert scale). Following this calculation, the mean for Present Control was 2.79; the mean for Past Control was 2.32; and the mean for Future Control was 3.06. All three orientations had means above the scale midpoint, suggesting that participants were more likely to agree than disagree with the scale items. The fact that Future Control had the highest mean score suggests that participants were more likely to endorse these items in response to the vignette. The Past Control orientation
had the lowest mean score, which indicates that this orientation was the least likely to be endorsed.

7.2.2 Descriptive statistics for the categorical variables. The preparation of the categorical variables for analysis involved defining the categories and coding the data for use in the analyses. This section describes this process for each of the variables.

7.2.2.1 General psychological distress. General psychological distress was measured using the Depression, Anxiety and Stress Scale (DASS). The DASS produced a total score, utilized as an indicator of general distress, as well as subscale scores for depression, anxiety and stress. Preliminary inspection of the DASS responses showed that the data were considerably skewed towards scores at the lower end of the range. This was appropriate for a non-clinical sample; however, it meant that the measure violated the assumption of normality required for use in regression analysis. Therefore, it was decided to form two categories of general psychological distress: clinical and non-clinical. The classification was based on the norms provided by the scale’s authors. Responses greater than two standard deviations above the mean were defined as being in the clinical range (Lovibond & Lovibond, 1995). If a participant scored above this level in one or more of the subscales they were allocated to the clinical category. All others were in the non-clinical category. In total 26% participants were in the clinical group (coded 1) and 74% were in the non-clinical group (coded 0).

7.2.2.2 Current traumatic distress. Four categories of previous traumatic experiences were included in the research questionnaire (proportion of participants that responded “yes” is in parentheses): sexual or physical assault (26%); danger of death or serious injury (39%); witness of death or serious injury (28%); and other very traumatic event (24%). In total, 65% of the sample had experienced at least one traumatic event. Participants who reported a traumatic experience also responded to
questions regarding the severity of the event and their past and current levels of distress. For the data analysis, a traumatic distress variable was created using the participant’s rating of the amount of distress the traumatic event currently caused them. Participants who responded above the scale’s midpoint (i.e., ≥ 4) were allocated to the current traumatic distress category (26% of the sample; coded 1); those who did not report a traumatic event or who rated their current distress below 4 were coded 0 (74% of the sample).

**7.2.2.3 Gender, age, and country of origin.** The demographic variables have been reported in the description of the study’s sample (Section 5.2). For the purposes of data analysis, the age and country of origin variables needed to be grouped into categories. Consistent with the sample being derived from a student population, age was significantly skewed towards the younger end of the spectrum (65% were aged between 18 and 24 years). As with psychological distress, this variable violated the assumption of normal distribution of the data. It was therefore decided to form “younger” and “older” age groups. The younger age group (coded 1) contained participants aged under 30 years (78%); the older age group (coded 0) contained participants aged 30 years or older (22%).

The re-coding of the country of birth variable was more complex. The first option considered for re-coding was to create “Australia and New Zealand (NZ)” and “all other countries” categories, however it was determined that the latter category would have too much cultural diversity. People from Asian, Middle Eastern and African nations are unlikely to share similar values to those from North America, who are actually more culturally similar to Australians. In particular, it was thought that there would be differences in the prominence of individualist/collectivist values which may significantly influence the response to the vignette. Therefore, it was decided to group the North Americans with the Australia/NZ participants to create an *individualist* country of origin group (coded 1), to
compare with the collectivist country of origin group (coded 0). The individualist country of origin group contained 74% of the sample.

Two problems were identified with this solution. First, participants from Europe may be from individualist (e.g., the United Kingdom) or collectivist (e.g., Eastern European countries) cultures. Second, country of origin was not a direct measure of the individualism/collectivism construct. A person may be born in a country such as Australia, but strongly identify with a different cultural identity, such as that of their parents who may have been born elsewhere. Despite these issues, it was decided to proceed with this categorisation as it made the simplest and most effective use of the available data. These assumptions were taken into account in the interpretation of findings.

Finally, the gender variable did not require any alteration. As reported in Section 5.2, 57% of the sample were female (coded 0) and 43% of the sample were male (coded 1).

7.2.3 Correlational analysis. The next step in the data analysis process was to conduct a correlational analysis (using Pearson’s correlation coefficients) with the eight continuous variables: Past, Present and Future Control; Neuroticism; Ambivalent Attachment and Avoidant Attachment; Optimism; and Extraversion. The results are presented in Table 7.3.

As indicated in Table 7.3, Present Control had moderate negative relationships with Neuroticism \((r = -0.42; \ p < .01)\) and Ambivalent Attachment Type \((r = -0.39; \ p < .01)\), and moderate positive relationships with Optimism \((r = 0.39, \ p < .01)\) and, to a lesser extent, Extraversion \((r = 0.29, \ p < .01)\). In addition, these variables had significant relationships with each other (e.g., Optimism has a relationship of \(r = -0.63\) with Neuroticism and a relationship of \(r = 0.43\) with Extraversion). It will be interesting to see how this pattern emerges in the multiple regression analysis. Present Control had weaker, although still statistically significant, relationships with Avoidant Attachment Type \((r = -0.13)\) and Future Control \((r = 0.24)\).
Table 7.3  
*Correlational Analysis with the Continuous Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pres. Control</td>
<td>.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Past Control</td>
<td></td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Fut. Control</td>
<td>.38**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Neuroticism</td>
<td>.04</td>
<td>-.16**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Ambiv. Att.</td>
<td>.03</td>
<td>-.14**</td>
<td>.47**</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Avoidant Att.</td>
<td>-.05</td>
<td>-.13**</td>
<td>.22**</td>
<td>.20**</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>7. Optimism</td>
<td>-.04</td>
<td>.21**</td>
<td>-.63**</td>
<td>-.39**</td>
<td>-.29**</td>
<td>-</td>
</tr>
<tr>
<td>8. Extraversion</td>
<td>-.06</td>
<td>.08</td>
<td>-.43**</td>
<td>-.27**</td>
<td>-.23**</td>
<td>.43**</td>
</tr>
</tbody>
</table>


Past Control exhibited only one statistically significant relationship with the variables in the correlational analysis. It had a moderate positive correlation with Future Control ($r = .38; p < .01$).

The strongest correlation with Future Control was the Past Control variable ($r = .38$). It was interesting that both Past Control and Present Control had significant positive correlations with Future Control, but not with each other. Future Control also had fairly weak, but significant, negative correlations with Neuroticism, Ambivalent Attachment Type, and Avoidant Attachment Type and a weak positive correlation with Optimism ($r = .21; p < .01$).

### 7.2.4 **Independent samples t-tests**

The categorical variables were investigated using independent samples t-tests, with gender, age, country of origin, clinical distress and traumatic distress as the grouping variables. Due to the number of analyses run (five for each temporal orientation), and the increase of Type I error risk associated with this, an adjusted $p$ value was used to determine statistical significance. These analyses used $p > .01$ as the
cut-off in the place of \( p > .05 \). The details of the statistically significant tests only are reported in this section.

For the Present Control orientation, three variables exhibited statistically significant group differences: gender, clinical distress and traumatic distress. For the gender t-test, men had a higher mean score (\( M = 17.39, SD = 3.03 \)) than women (\( M = 16.29, SD = 3.5 \); \( t (587) = 3.60, p < .001 \)). With regard to clinical distress, the non-clinical group scored higher (\( M = 17.28, SD = 3.28 \)) than the clinical group (\( M = 15.22, SD = 3.16 \); \( t (587) = 6.70, p < .001 \)). Consistent with the clinical distress variable, participants who did not report traumatic distress had a higher mean score (\( M = 15.94, SD = 3.47 \)) than those who did (\( M = 17.05, SD = 3.28 \); \( t (587) = 3.56, p < .001 \)).

For the Future Control orientation, age and clinical distress returned \( t \) values that were statistically significant. For the age variable, older participants had a higher mean score (\( M = 6.69, SD = 1.25 \)) than younger participants (\( M = 5.95, SD = 1.39 \); \( t (587) = 5.41, p < .001 \)). For clinical distress, the non-clinical group had a higher mean score (\( M = 6.27, SD = 1.37 \)) than the clinical group (\( M = 5.64, SD = 1.39 \); \( t (587) = 4.88, p < .001 \)).

For the Past Control orientation only the age variable demonstrated statistically significant group differences in the mean scores. Like the Future Control variable, the older participant group had a higher mean score (\( M = 12.27, SD = 1.25 \)) than the younger participant group (\( M = 11.39, SD 1.39 \); \( t (587) = 2.53, p = .01 \)).

7.2.5 Summary of preliminary analyses. This section reported the descriptive statistics for all variables and the findings of the preliminary analyses between the temporal orientation variables and the individual characteristics. The Present Control orientation was associated with the greatest number of individual characteristic variables. The Future Control variable exhibited a similar pattern of results, however the strength of the relationships was weaker (with the exception of the relationship with Past
Control). Surprisingly, the Past Control variable had only one statistically significant relationship with an individual characteristic variable (age); the other statistically significant relationship was with Future Control. Based on these results, the further analysis of this variable using multiple regression was unfounded. The second stage of analysis comprised two multiple regression analyses: one with Present Control as the DV and one with Future Control as the DV.

7.3 Multiple regression analysis

As with bivariate correlation, multiple regression techniques assess the strength of relationships between variables. In addition to this, multiple regression also allows the simultaneous evaluation of several variables’ (IVs) relationship with the DV and provides an estimate of the amount of variance explained in the DV by the IVs combined (Tabachnick & Fiddell, 2007). The beta values in the regression equation give an indication of the relative strength of the predictors. This is particularly important when, as is the case in the current study, there are significant correlations between the IVs.

In this section the findings of the hierarchical regression analyses, with Present Control and Future Control as the DVs, are presented. The IVs were the variables that had exhibited a statistically significant relationship with the DV in the correlational and t-test analyses (Section 7.2).

Hierarchical regression was selected because it enabled the assessment of additional variance explained in the DV when further IVs were added. This provided information regarding the relative importance of each IV. The order of entry into the regression model was based on how changeable the attribute was. Demographic variables were conceptualised as the least changeable so were entered first, followed by the personality variables, which, by definition, are long-standing. The distress variables referred to the experience of emotional arousal at the time of completing the questionnaire and were seen as more fluid. Finally, any other temporal
orientations that were related to the DV were entered. These were entered last to assess the contribution over and above that of the individual characteristics.

The findings of the multiple regression analysis are presented in three steps: (1) Evaluation of the assumptions of the test and the existence of multivariate outliers, with adjustments made to the dataset if required; (2) Inspection of the statistics relating to the regression model as a whole (e.g., adjusted $R^2$ and the change in $R^2$); (3) Examination of the each predictor’s contribution to the regression model.

### 7.3.1 Multiple regression analysis for the Present Control variable

A hierarchical regression was run with Present Control as the DV and gender in the first block; Neuroticism, Extraversion, Ambivalent Attachment, Avoidant Attachment and Optimism in the second block; clinical distress and traumatic distress in the third block; and Future Control in the final block. The preliminary analyses revealed one case with a Mahalanobis’ Distance value above the critical value (27.88). This case was deleted and the regression was re-run ($N = 588$). No violations of normality, linearity, multicollinearity and homoscedasticity were detected.

Next, the model was evaluated. Table 7.4 contains the adjusted $R^2$ values after each block of variables was entered, and the amount of change in this value (and the associated $p$ value) following each step.

**Table 7.4**

<table>
<thead>
<tr>
<th>Block</th>
<th>$R$</th>
<th>Adj. $R^2$</th>
<th>$\Delta R^2$</th>
<th>$F$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1$^a$</td>
<td>.16</td>
<td>.02</td>
<td>.02</td>
<td>$F (1, 586) = 15.69$</td>
<td>$&lt; .001$</td>
</tr>
<tr>
<td>2$^b$</td>
<td>.51</td>
<td>.25</td>
<td>.23</td>
<td>$F (5, 581) = 35.70$</td>
<td>$&lt; .001$</td>
</tr>
<tr>
<td>3$^c$</td>
<td>.51</td>
<td>.25</td>
<td>.00</td>
<td>$F (2, 579) = .96$</td>
<td>.38</td>
</tr>
<tr>
<td>4$^d$</td>
<td>.53</td>
<td>.27</td>
<td>.02</td>
<td>$F (1, 578) = 20.98$</td>
<td>$&lt; .001$</td>
</tr>
</tbody>
</table>

$N = 588$; $^a$ Variables entered = Gender; $^b$ Variables entered = Neuroticism, Extraversion, Ambivalent Attachment, Avoidant Attachment, Optimism; $^c$ Variables entered = clinical distress and traumatic distress; $^d$ Variables entered = Future Control.
The findings presented in Table 7.4 indicate that the IVs, when all entered, explained 27% of the variance in Present Control. The change in the $R^2$ value at each step of the analysis was statistically significant ($p < .001$) with the exception of block three, which contained the distress variables. The largest contribution to the model was the personality variables entered at step two.

To determine which of the IVs made a statistically significant unique contribution to the prediction of Present Control, the beta values were inspected. These results are provided in Table 7.5.

To summarise the findings in Table 7.5, five variables were identified as statistically significant predictors: gender (males higher scorers than females); Neuroticism (higher Neuroticism associated with lower Present Control scores); Ambivalent Attachment (higher Ambivalent Attachment associated with lower Present Control scores); Optimism (higher Optimism associated with higher Present Control scores); and Future Control (higher Future Control associated with higher Present Control scores).

Extraversion, Avoidant Attachment and both distress variables were not significant predictors in the multiple regression. This indicates that the relationships observed in the previous analyses were the result of shared variance with other IVs. In the case of the distress variables, it is likely that they shared variance with Neuroticism and Ambivalent Attachment which cancelled out their impact on Present Control. The implications of these findings is explored in detail in Chapter Eight where the findings are interpreted and linked to previous research.
Table 7.5
Regression Coefficients for Predictor Variables and Present Control

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Block 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>1.01</td>
<td>.28</td>
<td>.16**</td>
</tr>
<tr>
<td><strong>Block 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.79</td>
<td>.26</td>
<td>.12**</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>-.07</td>
<td>.02</td>
<td>-.17**</td>
</tr>
<tr>
<td>Extraversion</td>
<td>.01</td>
<td>.02</td>
<td>.02</td>
</tr>
<tr>
<td>Ambivalent Attachment</td>
<td>-.10</td>
<td>.02</td>
<td>-.23**</td>
</tr>
<tr>
<td>Avoidant Attachment</td>
<td>-.01</td>
<td>.02</td>
<td>-.01</td>
</tr>
<tr>
<td>Optimism</td>
<td>.13</td>
<td>.03</td>
<td>.18**</td>
</tr>
<tr>
<td><strong>Block 3</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.77</td>
<td>.26</td>
<td>.11**</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>-.06</td>
<td>.02</td>
<td>-.15**</td>
</tr>
<tr>
<td>Extraversion</td>
<td>.01</td>
<td>.02</td>
<td>.02</td>
</tr>
<tr>
<td>Ambivalent Attachment</td>
<td>-.10</td>
<td>.02</td>
<td>-.22**</td>
</tr>
<tr>
<td>Avoidant Attachment</td>
<td>-.00</td>
<td>.02</td>
<td>-.01</td>
</tr>
<tr>
<td>Optimism</td>
<td>.13</td>
<td>.03</td>
<td>.18**</td>
</tr>
<tr>
<td>Clinical Distress</td>
<td>-.35</td>
<td>.32</td>
<td>-.05</td>
</tr>
<tr>
<td>Trauma Distress</td>
<td>-.22</td>
<td>.29</td>
<td>-.03</td>
</tr>
<tr>
<td><strong>Block 4</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.69</td>
<td>.26</td>
<td>.10**</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>-.06</td>
<td>.02</td>
<td>-.15**</td>
</tr>
<tr>
<td>Extraversion</td>
<td>.01</td>
<td>.02</td>
<td>.03</td>
</tr>
<tr>
<td>Ambivalent Attachment</td>
<td>-.10</td>
<td>.02</td>
<td>-.21**</td>
</tr>
<tr>
<td>Avoidant Attachment</td>
<td>-.00</td>
<td>.02</td>
<td>-.00</td>
</tr>
<tr>
<td>Optimism</td>
<td>.10</td>
<td>.03</td>
<td>.15**</td>
</tr>
<tr>
<td>Clinical Distress</td>
<td>-.15</td>
<td>.32</td>
<td>-.02</td>
</tr>
<tr>
<td>Trauma Distress</td>
<td>-.34</td>
<td>.28</td>
<td>-.04</td>
</tr>
<tr>
<td>Future Control</td>
<td>.41</td>
<td>.09</td>
<td>.17**</td>
</tr>
</tbody>
</table>

N = 588; ** = p ≤ .01.

7.3.2 Multiple regression analysis for the Future Control variable. The second hierarchical regression was run with Future Control as the DV and age in the first block; Neuroticism, Ambivalent Attachment, Avoidant Attachment and Optimism in the second block; clinical distress in the third block; and Past Control and Present Control in the final block. Inspection of the residuals scatterplot (provided in Figure 7.1) revealed an
unusual pattern of results which indicated that there were problems with meeting the assumptions of multiple regression analysis.

As can be seen in Figure 7.1, rather than the expected rectangular pattern, the scatterplot had the residuals arranged in several straight slopes. A histogram of the results also revealed a non-normal distribution; 71% of the participants \((n = 419)\) had a score of 6 (out of 8) or above. These violations of the normality assumptions of regression analysis were likely due to the two-item structure of the scale itself. The alpha coefficient \((\alpha = .66)\) had indicated that there were issues with the internal consistency of this measure, despite the findings of the factor analyses suggesting that this construct had an adequate fit with the data.

**Figure 7.1.** Scatterplot for the Future Control items and the regression standardised residuals.
Given these issues, it was decided that a logistic regression analysis, which does not necessitate a DV that is normally distributed, was more appropriate. Logistic regression requires a categorical DV, so Future Control converted to a binary variable whereby high scorers, coded “1”, were classified as people with a score of 6 or above (six was the median score) and low scorers, coded “0”, were classified as people with a score below 6. Logistic Regression also permits hierarchical analysis, so the variables were entered in four blocks as previously described (Section 7.3).

Logistic regression provides a different set of statistics than a linear regression: a goodness of fit (chi-square) test that indicates whether the model is statistically significant; “pseudo” $R^2$ values (Cox & Snell and Nagelkerke statistics) to estimate the variance explained by the model; and predictor estimates that provide odds ratios (i.e., the increase in likelihood of having a high scorer on Future Control associated with an increase in the IV). The chi-square statistic and the Cox and Snell and Nagelkerke estimates for the regression model are presented in Table 7.6.

Table 7.6

<table>
<thead>
<tr>
<th>Block</th>
<th>$\chi^2$(df)</th>
<th>$p$</th>
<th>Cox &amp; Snell value</th>
<th>Nagelkerke value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1\textsuperscript{a}</td>
<td>15.04(1)</td>
<td>&lt;.001</td>
<td>.03</td>
<td>.04</td>
</tr>
<tr>
<td>2\textsuperscript{b}</td>
<td>22.42(4)</td>
<td>&lt;.001</td>
<td>.06</td>
<td>.09</td>
</tr>
<tr>
<td>3\textsuperscript{c}</td>
<td>3.35(1)</td>
<td>.07</td>
<td>.07</td>
<td>.10</td>
</tr>
<tr>
<td>4\textsuperscript{d}</td>
<td>60.17(2)</td>
<td>&lt;.001</td>
<td>.16</td>
<td>.23</td>
</tr>
</tbody>
</table>

$N = 588$; \textsuperscript{a} Variable entered = Age; \textsuperscript{b} Variables entered = Neuroticism, Ambivalent Attachment, Avoidant Attachment, Optimism; \textsuperscript{c} Variable entered = clinical distress; \textsuperscript{d} Variable entered = Past Control and Present Control.

The findings presented in Table 7.6 indicate that the IVs, when all entered, explained between 16% (Cox & Snell) and 23% (Nagelkerke) of the variance in Future Control. This was slightly lower than the shared
variance observed for the Present Control analysis and these estimates are less reliable than the $R^2$ value provided with linear regression.

The chi-square values give an indication of how well the model performs over and above the model in which no predictors are included. Higher, statistically significant, chi-square values represent a model that is better than the no IVs model. The results showed that the chi-square value was statistically significant ($p < .001$) at all stages except block 3 when the clinical distress value was entered ($\chi^2 (1) = 3.35, p = .07$). This gives an initial indication that clinical distress is not a unique predictor of future control. The other blocks of variables, however, all contributed to an increase in the Cox & Snell and Nagelkerke statistics, with block 4 (containing Past and Present Control) making the biggest contribution.

Rather than inspecting beta values, as with linear regression, logistic regression produces odds ratios that represent the likelihood of a participant exhibiting both the DV and the IV. Odds ratios are reported alongside 95% confidence intervals. This information, for each block of variables, is provided in Table 7.7.

Table 7.7

<table>
<thead>
<tr>
<th>Variable</th>
<th>Stage 1</th>
<th>Stage 2</th>
<th>Stage 3</th>
<th>Stage 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds ratio</td>
<td>95% C.I.$^a$</td>
<td>Odds ratio</td>
<td>95% C.I.</td>
</tr>
<tr>
<td>Age</td>
<td>.39***</td>
<td>.23-.65</td>
<td>.44***</td>
<td>.26-.75</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>.99</td>
<td>.96-1.02</td>
<td>1.00</td>
<td>.97-1.03</td>
</tr>
<tr>
<td>Ambiv. Attach.</td>
<td>1.00</td>
<td>.97-1.02</td>
<td>1.00</td>
<td>.97-1.03</td>
</tr>
<tr>
<td>Avoidant Attach.</td>
<td>.98</td>
<td>.96-1.01</td>
<td>.98</td>
<td>.96-1.01</td>
</tr>
<tr>
<td>Optimism</td>
<td>1.07**</td>
<td>1.01-1.12</td>
<td>1.07*</td>
<td>1.01-1.12</td>
</tr>
<tr>
<td>Clinical distress</td>
<td>.65</td>
<td>.41-1.03</td>
<td>.53**</td>
<td>.32-87</td>
</tr>
<tr>
<td>Past Control</td>
<td>1.25***</td>
<td>1.17-1.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present Control</td>
<td>1.10**</td>
<td>1.03-1.18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. Ambiv. Attach. = Ambivalent Attachment; Avoidant Attach. = Avoidant Attachment; $N = 588$; *** = $p < .001$; ** = $p < .01$; * = $p < .05$; C.I. = Confidence Interval.*
The findings of the logistic regression point towards a different set of significant predictors than that obtained for the Present Control variable. The results also suggest that the statistical significance of some variables (i.e., age and clinical distress) changed over the stages of analysis. The strongest predictor of whether a participant was a high scorer on Future Control was whether they endorsed Past Control and Present Control. Being a high scorer on Future Control was associated with a 1.25 unit increase in the Past Control score ($p < .001$) and a 1.10 unit increase in the Present Control score ($p < .01$).

In the first three stages of analysis, age was a significant predictor; older participants were between 2.56 and 2.17 times more likely to be a high scorer on Future Control (calculated by 1 divided by the odds ratio). When the other temporal orientations were added this variable was no longer significant. This might be because older participants scored higher on all of the orientations – the independent t test analyses found that older participants had significantly higher scores on Past Control also.

The findings with regard to Clinical Distress were interesting – this variable went from being non-significant in block 3 to significant ($p < .01$) in block 4. The odds ratio of .53 suggested that people who did not report clinical levels of distress were 1.89 (1/odds ratio) times more likely to be high scorers on Future Control. This is a departure from the findings for Present Control where Clinical Distress was non-significant and the personality variables played a greater role. For Future Control only one personality factor was significant: Optimism. Being in the high scorers group was associated with a 1.07 unit increase in Optimism. This odds ratio remained consistent throughout all stages of the model, which suggested that it was a unique contributor to Future Control even when controlling for other variables.
7.4 Chapter Summary

This Chapter has presented the investigation of the relationships between the temporal orientations and a selection of individual characteristics. The preliminary analyses found that Past Control had only one statistically significant relationship with the individual characteristics; therefore the multiple regression analysis did not proceed with this variable. Present and Future Control had significant relationships with a number of variables; however several of the IVs also had significant relationships between themselves. These findings indicated that further analyses using multiple regression were justified.

The second stage of analysis comprised a hierarchical multiple regression analysis with Present Control as the DV and a hierarchical logistic regression analysis with Future Control as the DV. Logistic regression was employed for Future Control as this variable did not have a normal distribution. Future Control was re-coded for the logistic regression into two categories: high scorers and low scorers.

For Present Control the multiple regression analysis found four significant, unique predictors: age (males higher scorers than females); Neuroticism (negative relationship); Ambivalent Attachment (negative relationship); Optimism (positive relationship); and Future Control (positive relationship). The strongest relationship ($\beta = -.21, p < .001$) was with Ambivalent Attachment.

The logistic regression analysis showed that the unique predictors of Future Control were Optimism, Past Control and Present Control. Age was a significant predictor in all but the final stage of analysis. Clinical distress was not significant when first entered in the model, but became a significant predictor when the other temporal orientation variables were added.
Chapter Eight: Interpretation of the Study’s Findings

8.1 Introduction

The current study investigated the responses of 589 participants to an imagined traumatic event (an armed robbery at an ATM). The aims of this study were to: 1) Test the validity of applying a model of meaning-making developed for posttraumatic responses, the Temporal Model of Perceived Control (TMPC; Frazier et al., 2003), to the context of an imagined traumatic event; 2) Analyse the relationships between the temporal orientations and other individual characteristics, such as personality traits and demographic features.

In this chapter the findings outlined in Chapter Six and Chapter Seven are interpreted and discussed with reference to the hypothesis and research questions proposed in Section 4.3.2. This chapter is structured in a way that reflects the steps taken in the statistical analysis. In Section 8.2, Hypothesis 1 and Research Question (RQ) 1, which connected to the factor analyses presented in Chapter Six, are explored. In Section 8.3, RQ2, RQ3 and RQ4, which related to the analyses in Chapter Seven, are examined. Interpretation of the study’s findings also included linking the results with those of previous studies, as reviewed in Chapters Two, Three and Four. Limitations of the current study, clinical implications and directions for future research are presented in the following Chapter (Chapter Nine).

8.2 Interpretation of findings related to the Temporal Orientations measurement model.

This section discusses the findings with respect to Hypothesis 1 and Research Question (RQ) 1. To reiterate from Section 4.3.2, Hypothesis 1 proposed that the TMPC would be a valid representation of the meaning-making processes observed for the imagined traumatic event. This was operationalised as an adequate fit between this model and the data obtained. Research Question 1 was: What are the similarities and differences between
the TMPC as it applies to an imagined event, compared with past research with actual traumatic events?

The approach to factor analysis, which involved both calibration and validation of the model, was similar to that reported by Frazier, Keenan et al. (2011), who also ran the CFA with more than one sample to ensure the model was robust. The findings of the factor analyses in the current study indicated partial support for the hypothesis. The final measurement model was consistent with the TMPC’s three-factor structure and returned fit statistics within the marginal range, however, alterations were required to both the Present and Future Control subscales. The Future Control construct in particular was problematic, and is discussed first. This discussion also forms the response to RQ1, which considered the ways the measurement model in the current study was similar and different to TMPC developed with stressful life events.

8.2.1 Future Control and the Factor Analysis findings. The EFA and CFA revealed that the reverse-worded items in the Future Control subscale substantially contributed to deterioration in model fit and were therefore removed. The two-item subscale that remained had low internal reliability and required re-coding as a categorical variable for the regression analysis due to its non-normal distribution. These issues were not consistent with Frazier, Keenan et al. (2011), who reported adequate fit for the 17 scale items and a three-factor model tested across multiple samples.

A possible explanation for the discrepancy between the current study and the findings of Frazier, Keenan et al. (2011) was that this construct did not translate well to a scenario involving an imagined event. It may have been too abstract for participants to imagine the event and then think about whether it would impact their perceptions of avoiding future events. The reverse-worded items may have been more difficult to comprehend; they required, not just imagining the event and the individual response, but also applying a more convoluted statement to this scenario (e.g., “There is
nothing I can do to prevent a similar event happening to me.”). That said, the remaining two subscales did not produce similar issues, despite the fact that they also required this “imagining” and included reverse-worded items. Therefore, it is unlikely that this is the full explanation for the problems with the measurement of Future Control.

Another possible reason is that people did not identify with this approach to making sense of the event. This possibility was dismissed, however, because the Future Control items received a high level of endorsement from participants (71% of the sample had a score of 6 out of 8 or above) – higher than that received for the other two orientations. The next step was to consider problems with the construct itself – this is discussed with reference to RQ2 in Section 8.3.1.3.

8.2.2 Present and Past Control and the Factor Analysis findings. Two items were removed from the Present Control subscale during the CFAs. This was again less problematic than for Future Control as five items remained and the internal consistency for the scale was sound (α = .78). One of the items removed appeared conceptually different to the others as it was the only item to refer to control over thinking – it was suggested that participants might feel they differed in their ability to control thoughts rather than emotions or other responses. The distinction between thoughts and emotions, while increasingly brought into question by neuropsychological research and brain-imaging (e.g., Pessoa, 2008), is commonly made in relation to cognitive approaches to therapy (e.g., Cristea, Montgomery, Szamoskoi, & David, 2013). Thus, it is possible that when asked about control over thoughts as part of the Present Control construct, participants had a different response than when they were asked about control over emotions or their response to the event more generally.

The second item was removed from the Present Control subscale to improve model fit. While removing items on primarily statistical grounds is not ideal, a poorly fitting model would have had negative implications for
subsequent analyses. Given that five items remained in this scale it was
determined that item removal was preferable to ongoing measurement
issues for the Present Control variable.

The removal of items from the Present Control subscale was a clear
point of difference between the current study and the previous findings of
Frazier, Keenan et al. (2011). There was no clear indication as to why the
items removed would have been interpreted differently in the current study;
it is worth noting that the same issue with distinguishing between control
over thoughts and other types of present control was not identified in earlier
studies. The need for further exploration of the components of Present
Control is discussed further in Chapter Nine with respect to future research
directions.

The Past Control subscale remained unchanged, and also had good
internal reliability (\(\alpha = .78\)). This subscale was consistent with the findings
of Frazier, Keenan et al. (2011).

8.2.3 Summary of Hypothesis 1 and Research Question 1.
Overall, the relatively good fit between the data and the measurement
model, and the limited number of changes to the original measure,
suggested that the theorised model was a valid representation of
participants’ responses to the imagined traumatic event. Participant
responses exhibited a distinction between Past, Present and Future Control
orientations that was consistent with the structure proposed by the TMPC.
The Past and Present Control orientations exhibited construct validity; this
was problematic for Future Control, perhaps due to issues with
comprehension of reverse-worded items. The validity of the temporal
orientations as useful constructs for understanding meaning-making
responses is considered in the following section, in relation to RQ2, RQ3
and RQ4, and in Chapter Nine.

It appears that the TMPC, developed as a theory of making sense of
actual events, was also broadly aligned with the pattern of responses in the
current study. To take this interpretation a step further, the results suggested that people have pre-existing tendencies towards different temporal orientations that guide their meaning-making for traumatic events. This is consistent with Zimbardo and Boyd’s (1999) work that indicated that time perspective (past, present or future) was a valid and reliable individual differences construct.

8.3 Interpretation of findings regarding the relationships among Temporal Orientations and Individual Characteristics.

The interpretation of findings for this section involves responding to Research Questions (RQ) 2, 3 and 4. Research Question 2 and RQ3 are examined in Section 8.3.1. To recap:

RQ2: What is the nature of the relationships between the temporal control orientations and other individual characteristics?
RQ3: Do any of the individual characteristics uniquely predict the present, past or future control orientations?

Research Question 4, which integrated the findings of the current study with research into risk and resilience factors for PTSD, is discussed in Section 8.3.2. This question was:

RQ4: How do the relationships identified between temporal control orientations and the individual characteristics compare to the adaptiveness of these variables suggested by risk factor research?

As with the previous section, the discussion in this chapter is focused on interpreting the findings and making connections with past research – the implications of these results for clinical practice and future research are considered in Chapter Nine.

8.3.1 Findings regarding the relationships between temporal orientations and individual characteristics. The analyses of relationships among the temporal orientations and the individual characteristics measured in the current study were reported in Chapter Seven. In this section, each temporal orientation is discussed separately in terms of the nature of the
detected relationships (i.e., RQ2) and the variables that were identified as significant and unique predictors (i.e., RQ3).

8.3.1.1 Present Control orientation and individual characteristics. The correlational analysis identified statistically significant relationships between Present Control and Gender (men higher scorers than women); Optimism (positive relationship); Extraversion (positive relationship); Neuroticism (negative relationship); Ambivalent Attachment (negative relationship); Avoidant Attachment (negative relationship); and both clinical and traumatic distress (negative relationship). A positive correlation was also observed with Future Control (this is discussed further in Section 8.3.1.3), but no significant relationship was detected with Past Control.

Several of the individual characteristics were interrelated, so it was anticipated that not all would remain significant predictors in the multiple regression.

The multiple regression analysis was conducted in four blocks to measure the contribution of each variable over and above that of other variables. Four individual characteristics were highlighted as statistically significant unique predictors (in order of the strongest relationship to the weakest): Ambivalent Attachment, Neuroticism, Optimism and Gender. The relationship with Future Control also remained statistically significant when all other variables were controlled for. Extraversion, Avoidant Attachment and both measures of distress were no longer significant in the multiple regression analysis. This suggested that they were not unique predictors; rather, they shared variance with other characteristics.

An overarching conclusion from these results is that stable characteristics, particularly those relating to the experience of emotional instability (i.e., Ambivalent Attachment and Neuroticism), had a greater impact on whether participants used a Present Control approach to the imagined traumatic event than more transitory levels of distress (i.e., clinical distress or traumatic distress) or demographic features. The
influence of personality variables on Present Control supports the idea that an individual’s meaning-making processes are shaped by pre-existing attributes, which in turn may confer either risk (in the case of Neuroticism and Ambivalent Attachment) or resilience (in the case of Optimism) in response to traumatic events.

Interestingly, the two types of insecure attachment, Ambivalent and Avoidant, exhibited different patterns of relationship with Present Control, despite both having a significant negative relationship in the correlational analysis. Ambivalent Attachment was clearly a significant and unique (negative) predictor of Present Control, whereas Avoidant Attachment was not. This pattern of results, whereby Ambivalent Attachment is a significant predictor but Avoidant attachment is not, is consistent with several previous studies into the linkage between attachment and posttraumatic outcomes (e.g., Elwood & Williams, 2007; Lilly & Lim, 2013; Scott & Babcock, 2010).

This finding is possibly linked to the differences in how emotion is processed in each of these Attachment types. For people with an Ambivalent Attachment type, emotions are experienced as overwhelming and heightened. A person with this type may even accentuate their distress in order to receive care, and are more reliant on others to assist in emotion regulation (Lopez, Mauricio, Gormley, Simko, & Berger, 2001). On the other hand, people with Avoidant Attachment actively inhibit their emotional response and deny negative emotions (Lopez et al.).

This discrepancy in emotion regulation has parallels to Present Control, which is fundamentally a strategy that involves the individual believing they can modulate their response to a stressful event. It is possible that participants with higher scores on the Ambivalent Attachment subscale were less likely to use Present Control strategies because they had more limited experience of self-regulating their emotions. While participants with Avoidant Attachment were also likely to struggle with emotional instability
(as reflected in the positive correlation with Neuroticism), their tendency to withdraw from others and inhibit their feelings perhaps meant that this Attachment type did not impact as greatly on the endorsement of Present Control strategies.

The finding that Neuroticism was a unique and statistically significant (negative) predictor of scores on Present Control is perhaps also due to the increased negative emotionality associated with this trait, and the connection between Neuroticism and emotion regulation capability. A critical aspect of Present Control is the perceived ability to manage the emotions that emerge in response to the stressful event (e.g., “When I am upset about the event, I can find a way to feel better”); however, as with Ambivalent Attachment, researchers have proposed that one of the reasons that Neuroticism is related to increased negative emotion is because it is associated with maladaptive emotion regulation (Ng & Diener, 2009). In other words, people high in Neuroticism experience more negative emotions and feel less able to ameliorate these (Ng & Diener).

Present Control encompasses elements of self-efficacy in managing emotional responses that are at odds with the constructs of Neuroticism and Ambivalent Attachment. This feature of Present Control was captured in Frazier, Keenan et al.’s (2011) study, whereby they observed positive correlations between Present Control and concepts such as general self-efficacy, mastery and perceived control over internal states. Present Control has also been found to be linked with adaptive coping strategies, such as utilising social support and engaging in cognitive restructuring (i.e., trying to see the stressful event in a new light; Frazier et al., 2005).

The adaptiveness of Present Control is multi-faceted and intertwined with features of secure attachment, self-efficacy and flexible coping styles. The apparent complexity of this finding echoes the conclusions drawn from previous research discussed in Chapter Three, and summarised in Chapter Four (Section 4.2.4). While the current study has certainly not resolved this
complexity, the data further reinforce the importance of investigating the influence of enduring characteristics, such as personality, on meaning-making responses, which in turn may impact psychological outcomes.

With regard to traits associated with positive emotionality, an additional finding of the current study was that Optimism remained a significant predictor of Present Control in the regression analysis; whereas Extraversion did not. In Frazier, Keenan et al. (2011) both characteristics were correlated with Present Control, however, multiple regression analysis was not conducted. The current study’s outcome suggests that Present Control is more influenced by a person’s outlook on life than their propensity towards positive emotion or their preference for social connections (both of which are components of Extraversion not necessarily shared by the Optimism construct). Optimism is, arguably, more open to being “learned” (see Seligman, 1992, for an extensive discussion of this), so the finding that Present Control has a stronger relationship with this attribute than with Extraversion is encouraging for the prospect of fostering change through the therapeutic process.

Another feature that Optimism may share with Present Control is enhanced flexibility in coping (Nes & Segerstrom, 2006) and a positive relationship with coping self-efficacy (Benight & Bandura, 2004). People high in dispositional optimism tend to feel more equipped to cope with life challenges (Scheier & Carver, 1985), which is a stance echoed in the items in the Present Control subscale (e.g., “How I deal with this event now is under my control”) and also in the past research on Present Control and coping (Frazier et al., 2005).

The only demographic variable with a significant relationship with Present Control was gender: males scored higher on this measure than females. Gender was not explored in the Frazier, Keenan et al. (2011) study, nor has it been investigated in relation to related constructs, such as perceived control over internal states (Pallant, 2000) or coping self-efficacy
(Benight & Bandura, 2004). While, on face value, there does not appear to be a reason why men would report higher use of Present Control strategies than women, it would be valuable to investigate this further as it may help understand some of the observed gender differences in response to traumatic events (Hetzel-Riggin & Roby, 2013). This is examined more closely in relation to risk factors for PTSD in Section 8.3.2, as well as in Chapter Nine regarding directions for further research.

8.3.1.2 Past Control orientation and individual characteristics. The data analysis did not show any significant relationships between Past Control and the individual characteristics. Past Control had a significant, moderate positive correlation with Future Control only (this relationship is discussed in Section 7.3.1.3). The factor analyses suggest that participants did use Past Control strategies to respond to the imagined event; however, the correlational analysis did not detect any linkages with this orientation and other individual characteristics.

While this echoed findings from Frazier, Keenan et al. (2011) in which Past Control correlated with self-blame and internal attribution measures, but not with personality measures, it still brings into question the usefulness of this construct as a way of understanding individual responses to stressful or traumatic events. Whereas connections between Present Control and other well-researched constructs such as attachment, optimism and neuroticism have been observed and replicated in the current study, Past Control appears to stand alone. The absence of significant relationships with other characteristics creates difficulties for understanding the ways in which this orientation operates within an individual’s psychological structures. It also makes interpretation of the mixed findings regarding Past Control and distress, described in previous studies (e.g., Frazier, 2003; Frazier et al., 2004; Frazier, Keenan et al., 2011), more difficult.

The implications of these results for clinical practice and future research will be examined in Chapter Nine. From the perspective of RQ2
and RQ3 it must be said that only one relationship was detected (with Future Control) and that a regression analysis was not run, so no significant, unique predictors were identified.

8.3.1.3 Future Control orientation and individual characteristics. The correlational analysis revealed that Future Control had statistically significant relationships with all personality variables except Extraversion, although the observed relationships were relatively weak ($r < .25$) apart from that with Past Control ($r = .38$). The t test analyses identified age and clinical distress as significant predictors.

Inspection of the distribution of the Future Control variable as part of the multiple regression found notable departures from normality. Therefore, it was decided to recode the variable into two categories (high scorers and low scorers) and a logistic regression was conducted. The results of this analysis found only Optimism and clinical distress were significant and unique predictors in terms of the individual characteristics. Present and Past Control also remained significant in the logistic regression.

The connection between Optimism and Future Control was proposed by Frazier, Keenan et al. (2011), although in their analysis they did not find a significant relationship between these constructs. Whereas Optimism was thought to relate to Present Control because of an increased sense of self-efficacy and flexibility in coping, for Future Control it is likely related to the fact that the two constructs share the expectancy of positive future outcomes. This, in part, is due to a feeling that these outcomes can be controlled (i.e., “I can do things to make sure I will not experience a similar event in the future.”). As with Present Control, this is different to Extraversion or the increased experience of positive emotionality, and seems to be more related to a sense of having influence over future outcomes.

The connection between Future Control and clinical distress (people high in clinical distress were less likely to be high scorers on Future
Control) was a challenge to interpret. While it seemed logical that higher levels of distress meant that people felt less confident that they could prevent future traumatic events from occurring, the fact that this relationship was significant only when the other two temporal orientations were entered into the analysis was perplexing. At face value it appeared that the change in significance was due to the idea that clinical distress may relate to all three of the temporal orientations, however the previous analyses had confirmed that this was not the case. As it stands, this finding should be noted with caution, and may be an anomaly of the dataset rather than representing a replicable linkage between the constructs.

Significant relationships among the temporal orientations were observed in other stages of the analysis. However, the common thread was the relationship shared between Future Control and both Past Control and Present Control. These relationships were positive, which indicated that people in the high scorer category for Future Control were also likely to be higher scorers on Past and Present Control. This pattern of findings was similar to that reported in Frazier, Keenan et al. (2011) in her discussion of developing the measure of the TMPC. Frazier, Keenan et al. provided limited explanation of the reasons for this connection between concepts, except that the three orientations are “related but distinct” (p. 755). It is feasible that the temporal orientations share common ground with respect to general control beliefs, however Frazier, Keenan et al. did not detect a significant relationship between Past Control and either general self-efficacy or mastery.

Another possible explanation is that the relationship between control orientations represented confusion between the concepts. As they were being applied to an imagined traumatic event, it might have been more difficult for participants to distinguish between past and future control strategies, leading participants to respond in a similar way to all items. That said, a two-factor structure was explored in the EFA and it did not exhibit a
good fit with the data. A second order factor that combined the Past and Future factors was also run for the CFA and it did not improve model fit. Therefore, the reason for the significant relationships between the factors remains unclear.

8.3.1.4 Summary. The findings of the regression analysis indicate that the Present Control orientation clearly exhibited the greatest number of significant relationships with individual characteristics. Past Control had no significant relationships and Future Control had only one significant predictor (Optimism) that was interpretable. These observations replicate the findings of past research, in which Present Control has exhibited the strongest and most consistent relationships with other variables (e.g., Frazier et al., 2005; Frazier, Keenan et al., 2011), whereas Past and Future Control have been much more unpredictable. Given the contrast between the robust results for Present Control and the patchier findings for the other orientations, Present Control is the focal point for the discussion of RQ4 (see Section 8.3.2).

The findings also suggest that relatively stable personality characteristics had a stronger connection with the meaning-making response to the imagined traumatic event than current levels of distress or demographic features. This provides evidence for the influence of pre-existing cognitive structures that shape and interact with the meaning that is created from traumatic events.

The final stage of interpretation of the current study’s findings was to consider the linkages between the relationships detected in the regression analysis and the literature regarding risk and resilience factors for PTSD. As mentioned above, it was determined that Present Control be the focus of this discussion due to the limited (or non-existent, in the case of Past Control) nature of the relationships between the individual characteristics and the other temporal orientations.
8.3.2 Linkages between the current study’s findings and PTSD risk factor research. The current study aimed to incorporate the findings from an investigation of meaning-making strategies (i.e., the TMPC) within the broader context of pre-existing vulnerability and resilience factors for PTSD, in order to better understand how premorbid functioning may influence the trajectory of recovery. As described in Chapter Four (and with respect to RQ4), the individual characteristics selected for inclusion in the analysis were derived from research regarding vulnerability and resilience following traumatic events (see Table 4.2 for a summary of these relationships).

The discussion for RQ4 will centre on Present Control, which appeared the most robust of the temporal orientations and exhibited the greatest number of significant relationships with individual characteristic variables in the regression analysis. Present Control has been found to be an adaptive response to trauma (e.g., Frazier 2003; Frazier et al., 2005; Frazier, Keenan et al., 2011); therefore it was anticipated that it would exhibit a significant negative relationship with attributes identified as risk factors for PTSD and a significant positive relationship with attributes categorised as resilience factors.

Generally, this prediction held true for the relationships observed in the current study. This supported the contention that the way people make sense of events is shaped by other features of their psychological organisation, and that these attributes are important considerations for understanding recovery and response to treatment. This is expanded upon in reference to the clinical implications of the current research in Chapter Nine.

While some variables were not significant predictors of Present Control in the regression analysis (e.g., Avoidant Attachment, Extraversion, age, country of origin, and current levels of distress), part of this pattern of results may have been due to the relatively small influence of the variable
(in the case of age and country of origin) or the difference between utilising
an imagined traumatic event rather than an actual event (in the case of
current distress).

To elaborate, Brewin et al.’s (2000) meta-analysis of PTSD risk
factors indicated that younger age and minority race status were associated
with weaker effect sizes than those observed for other risk factors. It is also
possible that these demographic variables had limited influence on
meaning-making, particularly Present Control; however there is a
considerable body of research that suggests that cultural differences exist in
the attributional response to traumatic events (e.g., Morris, Menon, & Ames,
2001; Morris & Peng, 1994).

Part of the reason for not detecting a relationship may have been due
to the sample itself – all participants who identified as being born outside
Australia, New Zealand or the United States were grouped together, which
would fostered considerable heterogeneity in this category. The fact that
culture was not a central focus of the current research meant that the
recruitment of participants had not emphasised acquiring a culturally
diverse sample (the diversity that existed was representative of the student
population), nor were questions included to ensure the cultural background
of participants was clearly understood. Suggestions for further research,
based on exploring cultural differences more methodically, are outlined in
Chapter Nine.

The absence of a significant relationship between current
psychological distress and Present Control is most likely due to the effect of
having participants respond to an imagined event rather than an actual
traumatic event. In studies based on actual traumas, the distress being
detected is, at least in part, connected to the event that the participants are
being asked to reflect on. Thus, these studies are measuring a direct
relationship, rather than the indirect influence assessed in the current study.
The absence of a significant relationship between current distress and
Present Control in the current study, even to distress related to previous trauma, further supports the important role of stable attributes, rather than state-based experiences in shaping meaning-making. This underscores the importance of elucidating lay theories of attribution rather than focusing solely on the response to one specific event.

In summary, many of the attributes identified in research into risk and resilience factors for PTSD exhibited a significant relationship with Present Control in the current study. These included gender, ambivalent attachment, neuroticism and optimism. In contrast to findings from the PTSD literature (e.g., Bonanno, 2004; Brewin et al., 2000; Ozer et al., 2003), extraversion, avoidant attachment, age, cultural background and current levels of distress were not significant predictors. The extraversion and avoidant attachment variables were discussed in the previous section; in this section, the results in relation to the demographic and distress variables are interpreted.

One explanation for the current findings, reiterated throughout this Chapter, is that pre-existing individual characteristics influence the use of Present Control as a response to a traumatic event. Following on from this, part of the reason that Present Control has been found to be associated with better posttraumatic adjustment could be due to its role as a mediating variable between personality characteristics and distress. The current study did not directly explore this, more complex, structural model as an imagined event was used, which prevented the measurement of distress in response to the event. Recommendations for the further exploration of this model are discussed with regard to future research directions in Chapter Nine.

8.4 Chapter Summary.

This chapter has discussed and interpreted the findings from the current study according to the study’s hypothesis and research questions. Put briefly, the findings of the statistical analysis suggested that the participant’s response to the imagined traumatic event was largely
consistent with the three-factor structure of the TMPC, although problems with the measurement of the Future Control construct were identified. Results suggested that this theory, developed in the context of actual traumatic and stressful events, could be translated to an imagined event. In turn, it was proposed that people may have pre-existing tendencies to interpret events with a past, present or future focus, consistent with research by Zimbardo and Boyd (1999).

With regard to relationships with other individual characteristics, identified as important variables in PTSD risk and resilience factor research, only Present Control exhibited significant and interpretable connections. The strongest relationship was with ambivalent attachment, although Neuroticism, Optimism and Gender were also significant predictors. It was put forward that Present Control may have links to concepts such as emotion regulation, positive expectancies for future events and self-efficacy, which may further explain why it is an adaptive response to traumatic events.

Finally, the current study’s findings highlighted the importance of stable personality-related characteristics over demographic features or transient levels of distress. This was a departure from the literature on risk factors for PTSD, however might have been a consequence of using an imagined event and the fact that demographic features such as culture were not a direct focus when recruiting participants. It also echoed findings in previous studies where the relationship between personality variables and posttraumatic outcomes has been inconsistent and complex.

The results of the current study have raised several questions that warrant further consideration, as well as implications for clinical practice. These are expanded upon in Chapter Nine, following consideration of the study’s limitations.
Chapter Nine: Limitations of the Current Study, Clinical Implications and Directions for Future Research.

9.1 Introduction.

The purpose of this chapter is threefold. First, the limitations of the current study are identified and their impact on the generalisability of the current study’s findings is examined. Second, the implications of the results on clinical practice are considered, particularly with reference to treatment for survivors of traumatic events. Third, suggestions for future research are put forward. These stem from the limitations identified in the first part of this chapter, as well as extending the current study’s results. This chapter concludes with a summary of the entire research project, which establishes the findings within the context of the literature reviewed in Chapters Two and Three.

9.2 Limitations of the Current Study.

As has been alluded to in both Chapter Four, when the study was described, and Chapter Eight, when the findings were interpreted, this study had methodological limitations that impact the generalisability of the findings. A key decision-point when designing the current study was whether to focus on events that the participants had experienced themselves or whether to try and hold this event constant so the analysis could focus on the underlying psychological constructs while controlling for the impact that differing events may have. In Chapter Four, section 4.3.2, the rationale for the methodological design was provided; in this section the limitations of this design are considered in more depth.

Perhaps the most important observation to make is that imagining how one might respond to a trauma is not directly equivalent to one’s actual response, so caution must be taken in concluding that the current study’s findings directly translate to how people make sense of an actual traumatic event. As the current study did not look at the relationship between the
temporal control orientations and psychological outcomes; conclusions
cannot be drawn about the validity of this model for capturing posttrauma
responses. Nor does this research add to the existing literature provided by
Frazier and colleagues (e.g., Frazier, 2003; Frazier et al., 2004; Frazier et
al., 2011) about the link between temporal orientations and distress.

The focus instead was whether the orientations could be a
framework for understanding cognitive responses to imagined events and
thus be understood as pre-existing biases, or lay theories of meaning-
making, that interact with other individual characteristics. In this way the
current study was linked to attribution theory and research into
vulnerabilities or protective factors for posttraumatic distress. As articulated
in Chapter Four, the temporal orientations were conceptualised as similar to
the lay theories articulated in the attribution literature. While the content of
the vignette depicted a trauma, the findings are perhaps more relevant for
understanding the role of temporal orientation in meaning-making more
generally, particularly how the present orientation might link to Ambivalent
Attachment and Neuroticism. This issue is returned to in the discussion of
future research possibilities.

A further complication of using an imagined traumatic event was
that it created an additional layer of abstraction for participants. Not only
did they need to be conscious of how they responded to events (such as
would be the case for any study that required reflection on cognitive
processes); they also needed to make a prediction about how they would
respond to a hypothetical event. As mentioned in Chapter Eight when
interpreting the difficulties observed with the measurement of Future
Control, this additional complexity may have hampered the effectiveness of
the Perceived Control Over Stressful Events Scale. That said, the changes to
this scale were relatively limited, so it appeared that on the whole the TMPC
was applicable to an imagined event.
The next limitation to be considered is linked to the ability to reliably ascertain participants’ meaning-making through the use of self-report measures. As with any study that captures cognitive processing by asking participants to describe their response to an event, the current study is limited by the degree to which participants were conscious of their thoughts and meaning-making processes. Debate surrounding people’s access to their higher-order cognitive processes and the role of conscious thought in determining behaviour has persisted in the literature for several decades (e.g., Bargh & Chartrand, 1999; Masicampo & Baumeister, 2013; Nisbett & DeCamp Wilson, 1977; Pocket, 2004). A number of researchers (e.g., Hassin et al., 2002; Kahneman, 2011), as summarised in Chapter Two (section 2.2), have identified the role of implicit processes and cognitive biases in meaning-making processes.

That said, it has been acknowledged that people are readily able to answer questions regarding the causes for events or their meaning-making processes (Nisbett & DeCamp Wilson, 1977). This suggests that pre-existing beliefs or theories may be usefully investigated and discerned, even if these beliefs may not completely explain an individual’s response if an event was to occur. With regard to the current study it is important to clarify that the findings elucidate some of the pre-existing meaning-making strategies held by the participants – these may well influence their cognitive processes in the case of an actual traumatic event – but it would be over-stating things to suggest that responses to an imagined event are directly equivalent to responses to an actual event. Examination of implicit processes or biases is frequently investigated using experimental methodologies – the possibilities of using these techniques are discussed in section 9.4.

Finally, it is necessary to consider limitations to generalisability associated with the sample itself. The current study’s sample was predominantly taken from a student population and, as such, was
disproportionately young and well-educated when compared to a community sample. This sample was consistent with those used in previous studies of the Temporal Model of Perceived Control (e.g., Frazier, Keenan et al., 2011), however, it remains to be seen whether the findings would be similar for a sample that was more broadly representative of the community. In particular, it would be interesting to determine whether the results would hold if the sample contained a wider range of age groups, socio-economic status or educational backgrounds, or a higher proportion of individuals from non-english-speaking countries. Investigation of the temporal orientations with different populations may form part of future research (discussed in section 9.4).

9.3 Implications for Clinical Practice.

The findings of the current study have several implications for clinical practice, particularly with people seeking support for recovery following stressful or traumatic events. This section addresses these impacts under three broad categories: (1) consideration of predisposing psychological factors; (2) fostering a present control orientation in treatment; and (3) applications for patients presenting with worry or rumination about traumatic events.

9.3.1 Consideration of predisposing psychological factors.

Perhaps one of the clearest findings from the current study was the influence of long-standing individual characteristics on the Present Control orientation, rather than current distress or demographic variables (with the exception of gender, which was also a significant predictor). From a clinical perspective, these results highlight the importance of assessing a patient’s long-standing psychological structures, such as personality or attachment type. This fits within a biopsychosocial case formulation (Engel, 1980; Plante, 2005) as part of the predisposing psychological factors component. Clinicians could include brief measures of these variables in their assessment sessions, particularly when using treatment approaches that
emphasise cognitive processes such as meaning-making (e.g., Cognitive Therapies).

These attributes need to be considered when formulating the client’s presenting concern and provide the context for current responses to trauma, including the meaning-making responses. While personality attributes and attachment type may be difficult foci for change, their identification is important in understanding the client’s response to treatment or how current distress is maintained. A clinician who works just with the current level of distress or views the cognitive processes outside the context of pre-existing structures may fail to anticipate barriers to treatment or underlying drivers of psychopathology.

9.3.2 Fostering a present control orientation. Consistent with the findings of numerous previous studies, on both the Present Control orientation (e.g., Frazier, 2003; Frazier et al., 2004; Frazier et al., 2011) and other present-focused constructs (e.g., perceived control of internal states, Pallant, 2000), the current study indicates that Present Control was an adaptive meaning-making style. This was supported by its significant positive relationship with dispositional optimism and its significant negative relationships with Neuroticism and Ambivalent Attachment. The benefits of a Present Control orientation for recovery from trauma, and perhaps for psychological functioning more generally, mean that cultivating this attribute could be a worthwhile focus for psychological treatment.

A prominent trend in the treatment literature has been the growth of present-focused mindfulness-based interventions to treat a range of psychological disorders, such as depression (e.g., Hofman, Sawyer, Witt, & Oh, 2010; Piet & Hougaard, 2011); social anxiety (e.g., Piet, Hougaard, Hecksher, & Rosenberg, 2010); generalized anxiety disorder (e.g., Craigie, Rees, Marsh, & Nathan, 2008); and bipolar disorder (Miklowitz et al., 2009). Mindfulness-based interventions have also been investigated in the treatment of trauma (Briere, 2012; King et al., 2013). A key feature of these
approaches is the emphasis placed on bringing the client’s attention to their present experience, and supporting clients to tolerate and accept current experiences with non-judgment and self-compassion (Baer, 2003). It could be argued that mindfulness-based approaches promote a Present Control orientation, as both emphasise what is needed in the present moment rather than the past events or anticipating the future.

A Present Control orientation may also be linked to an increased sense of self-efficacy, which has been found to have a positive relationship with subjective well-being (e.g., Caprara & Steca, 2005; Carver & Scheier, 1999; Luszczynska, Scholz, & Schwarzer, 2005; Strobel, Tumasjan, & Spörrle, 2011). As discussed in the previous chapter (section 8.3.1.1), it is possible that self-efficacy could be an important factor in explaining the relationships between Present Control and the personality variables measured in the current study. Further exploration of the link between Present Control orientation and mindfulness-based treatments, as well as how the Present Control orientation may be fostered in treatment, is provided in relation to future research ideas (section 9.4).

9.3.3 Applications to patients with worry or rumination about imagined traumatic events. Worry and rumination are prominent features of several high prevalence clinical disorders, particularly major depressive disorder and generalized anxiety disorder (e.g., Hanrahan, Field, Jones, & Davey, 2013; Papageorgiou & Wells, 2003). The current study’s use of an imagined event tapped into how meaning is made in an abstract sense, which may in turn relate to clients presenting with worry or rumination about possible traumatic events. As reviewed in Chapter Four (section 4.2.3) around 20% to 30% of the population expresses a fear of crime (Farrall & Gadd, 2004), which is not necessarily linked to having actually experienced a crime (Jackson, 2009).

Therefore, clinicians working with worry and rumination may find it helpful to consider how their client’s attributional processes (and the
temporal orientation their client exhibits) may also be impacting on their levels of adjustment and distress. As highlighted in the previous section, clinicians who identify that their client’s worry or rumination leads to a Past or Future Control orientation may work to cultivate a Present Control emphasis. Present-oriented treatment, such as mindfulness-based cognitive therapy, has been shown to be effective with both rumination (e.g., Shahar, Britton, Sbarra, Figueredo, & Bootzin, 2010) and worry (e.g., Delgado et al., 2010). This may also generate greater self-efficacy, which is thought to reduce the fear of crime (Jackson, 2009).

9.4 Directions for Future Research.

Several directions for further research have emerged from the findings of the current study. These primarily focus on further investigation of Present Control, as this temporal orientation has been found to be the most robust across studies, as well as having meaningful and replicated connections with other constructs. The possibilities for future research discussed in this section include: (1) using more complex structural models to better understand the link between Present Control, other predisposing or co-occurring factors, and psychological outcomes; (2) exploring the enhancement of a Present Control orientation using treatment interventions; (3) investigating Present Control using an experimental methodology; (4) examining possible cultural differences in temporal orientations; and (5) better understanding the gender differences observed in Present Control.

9.4.1 Research directions for investigating more complex structural models. One of the limitations of using an imagined event in the current study was that the connection between Present Control and psychological outcomes could not be assessed; nor could path analysis be conducted between Present Control and predisposing factors to determine direct and indirect relationships with wellbeing. Further research that tested more complex structural models would advance the understanding of why Present Control is linked to better psychological outcomes in the context of
stressful or traumatic events. It would be useful, particularly from a clinical perspective, to delineate relationships with other key constructs and identify whether a Present Control orientation is useful in and of itself, or whether the link with well-being is mediated by its relationship with other attributes.

Analysis of meditation, similar to that recommended above, has been conducted into the relationships among coping self-efficacy (which has a conceptual overlap with Present Control), negative cognitions, and posttraumatic stress (Cieslak, Benight, & Lehman, 2008). The researchers hypothesised that coping self-efficacy, defined as the “belief in one’s own ability to manage posttraumatic recovery demands” (Cieslak et al., p. 788), would mediate the relationship between negative cognitions and posttraumatic stress. They completed two studies; one was cross-sectional with a sample containing women who had experienced child sexual abuse and the other was longitudinal with a sample of motor vehicle accident survivors. Their findings showed that coping self-efficacy mediated the relationship between negative cognitions (about the self and the world) and posttraumatic distress across both samples.

Given that both coping self-efficacy and Present Control relate to a sense of agency and perceived control, it may be worthwhile investigating whether Present Control beliefs have a mediating impact on the relationship between negative cognitions and posttraumatic stress. It would also be useful to better understand the connections between coping self-efficacy and Present Control. In particular, to what degree are these concepts able to be distinguished from each other in terms of their impact on psychological outcomes? The link between Present Control and general self-efficacy has been explored by Frazier, Keenan et al. (2011), however, they did not investigate this relationship using more complex statistical techniques, such as the path analysis recommended here.

In addition to further examining Present Control and self-efficacy, another area of interest is the role of Present Control in emotion regulation.
and vice-versa. The connection between Present Control and emotion regulation has not received significant attention in past studies, perhaps because Present Control has been placed within the meaning-making literature and is thus more focused on cognitive processes. The observation in the current study that Present Control related differentially to the Ambivalent and Avoidant Attachment Types, however, suggest that it could be connected to how emotions are managed.

One of the findings of the regression analysis was that Ambivalent Attachment was a significant negative predictor of Present Control, however Avoidant Attachment was not. It was suggested in the previous chapter that this may have been due to the patterns of emotion regulation related to these attachment types. High scorers on Ambivalent Attachment tend to experience their emotions as overwhelming and feel unable to manage on their own, whereas high scorers on Avoidant Attachment are more self-reliant (Lopez et al., 2001). In a future research study it would be worthwhile replicating this pattern of relationships between Present Control and Attachment Type, but also including a measure of emotion regulation strategies to determine the path between Attachment Type and psychological outcomes.

In terms of how emotion regulation may be conceptualised or measured in a future research study, it is important to note current debates in this area. Recent studies have emphasised flexibility in the use of emotion regulation strategies as being more important for adaptive coping than the actual emotion regulation strategy used (e.g., Bonanno & Burton, 2013; Bonanno, Papa, Lalande, Westphal, & Coifman, 2004; Kashdan & Rottenberg, 2010). The flexibility hypothesis asserts that regulatory strategies are not uniformly “adaptive” or “maladaptive”, but that it depends on their context (see also Aldao, 2013, for a discussion of the importance of context in emotion regulation). For example, if a person is experiencing high emotional arousal (e.g., anxiety) the most effective regulation strategy
would be different than if they were in a state of low emotional arousal (e.g., depression). This hypothesis attempts to explain the considerable variability in findings regarding the links between specific emotion regulation approaches and psychological outcomes (Bonnano & Burton; Kashdan & Rottenberg).

With this in mind, it may be useful to test whether Present Control is associated with greater emotion regulation flexibility, and whether this construct accounts for the link between Present Control and psychological outcomes, or whether Present Control explains variance in distress independently. With regard to linking this with Attachment Type, the model could also incorporate the Ambivalent and Avoidant Attachment constructs. It would be anticipated that high scores on one or both insecure Attachment Types would be associated with lower flexibility, given that Attachment Types are conceptualised as fairly rigid, however again it would be useful to determine the direct and indirect pathways that may exist between Attachment, Present Control, Emotion Regulation and Psychological wellbeing.

9.4.2 Research directions for enhancing Present Control using treatment intervention. As outlined in section 9.3 of this chapter, one of the clinical implications of the current study is that the cultivation of a Present Control orientation could be a target for treatment. In section 9.3 it was also suggested that Present Control may be related to concepts of mindfulness, which has been investigated as an effective treatment for a wide range of disorders (e.g., Craigie et al., 2008; Miklowitz et al., 2009; Piet & Hougaard, 2011; Piet et al., 2010). Mindfulness is defined by Kabat-Zinn (1994) as paying attention in a particular way “on purpose, in the present moment, and non-judgementally” (p. 4). While this is by no means synonymous with the Present Control orientation, there is overlap with regard to the focus being on the present rather than the past or future.
It would be useful from a clinical perspective to determine whether a mindful disposition (see Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006, for an empirical investigation of the facets of this construct) has links with Present Control. If this connection does exist, future research could also look at whether mindfulness-based treatment approaches significantly increase the Present Control orientation. Research of this kind could also look at whether this is linked to better treatment outcomes. As with the investigation of the relationship between Present Control and emotion regulation described in the previous section, the next stage of research involves determining whether Present Control is something that is theoretically and practically distinct from other constructs in the enhancement of well-being (in this case, is it a useful concept in addition to that of mindfulness). If it is, then its validity as a target for treatment is strengthened.

9.4.3 Alternatives to self-report measures of Present Control.

One of the limitations of the current study, and indeed many studies of the link between attribution and behaviour, was that it relied on the self-report of participants (see section 9.2 for a discussion of these limitations). To better understand how the Present Control orientation relates to behaviour, future research could consider other methodologies. One possibility could be an experimental approach in which a Present Control orientation is measured and then behaviour in response to a stressful event is observed. Such an experiment could also look at whether a Present Control orientation can be primed.

The difficulty with this approach would be developing an experiment that would meet ethical standards – understandably, there are limits placed on inducing stress in study participants. That said, linking a self-reported Present Control orientation with behavioural observations would be an excellent way to better understand this construct and how it operates in improving psychological outcomes.
9.4.4 Research directions for cultural differences in temporal orientations. The current study did not find any significant differences in the endorsement of temporal orientations based on cultural differences, however, the literature indicates that culture does play a role in meaning-making and attributional processes (e.g., Morris & Peng, 1994), as well as many other processes linked to psychopathology (e.g., Barnow & Balkir, 2013). An influential study by Morris and Peng (1994) found across a series of experiments that American students (described as being from an individualist culture) were more likely to make dispositional attributions, whereas Chinese students (described as being from a collectivist culture) emphasised situational factors in their causal explanations. These cultural differences were tracked to linguistic differences, educational differences (i.e., variation in the way material is commonly taught in the education system), and the influence of media reporting, which in turn shaped the individual’s cognitive processes.

It was discussed in the limitations of this study that there were several issues in the way cultural differences were measured in the current research. The culture variable involved grouping together participants who were born in any country except Australia, New Zealand and the United States. The culture that participants identified with was not recorded; nor was any measure of cultural values included. This meant that there was considerable, unaccounted for, heterogeneity in both culture groups which would have influenced the ability to detect significant findings.

Future research could recruit a sample with greater cultural diversity and include more detailed questions regarding the cultural background of the participants. Known dimensions of cultural difference, such as individualism/collectivism (Hofstede, 1997; Hui, 1988), could be assessed. This would enable a more in-depth exploration of the relationship between cultural values and temporal orientations that may help explain different responses to stressful or traumatic events. Knowledge of cultural differences
would have implications for clinical practice, as well as for the applicability of attribution theory to the broader population.

### 9.4.5 Research directions for gender differences in Present Control

The current study detected a significant relationship between gender and use of the Present Control orientation, however interpretation of this finding was limited, as it had not been discussed in previous studies of the Temporal Model of Perceived Control. That said, gender differences have been observed in the trauma literature (e.g., Hetzel-Riggin & Roby, 2013), with the suggestion that men and women may form different attributions about interpersonal violence.

Future research could aim to replicate the finding of the current study (i.e., that men score higher on Present Control than women) and perhaps determine an explanation for this finding. A review by Nolen-Hoeksema (2012) highlighted gender differences in emotion regulation that may be relevant to the current study and worth further exploration. She noted that women were more likely to use rumination and that relatively little is know about how men regulate their emotion (Nolen-Hoeksema).

Future research using structural models of the relationships between predisposing factors, Present Control and psychological outcomes (as described in section 9.4.1) could include invariance testing based on gender to determine if the results are consistent for men and women.

### 9.5 Conclusion

The current study has found that the TMPC can be applied in the absence of an actual traumatic event, and that individuals do exhibit differences in how they make sense of a traumatic event according to temporal orientation. The findings have provided support for the relevance of the Present Control orientation as a possible resilience factor in the recovery from traumatic and stressful life events, which has relationships with other well-established personality attributes (e.g., Neuroticism, Optimism, Ambivalent Attachment type). The usefulness of Past and Future
Control was more questionable, and it might be that these constructs need further refinement before they are included in subsequent research.

This research has provided further support for the current movement in psychological practice towards helping people connect with the present moment and build their flexibility and self-efficacy in managing distress as it arises in a variety of contexts. It is hoped that these findings contribute towards better understanding the recovery process from stressful and traumatic events, as well as how long-standing cognitive patterns can impact on well-being.
REFERENCES


Appendix A: Vignette used in the study

**Directions:** Please read the scenario and imagine it happening to you. The actions and responses presented in the scenario may differ from how you think you would actually react, however please visualise as well as you can the situation as it is described. Following the scenario you will be asked to respond to a series of questions about how you might feel after such an event.

It is 8pm on Saturday night and you are driving to a restaurant to meet friends for dinner. On your way you stop at an Automatic Teller Machine (ATM) in a shopping strip to withdraw some cash. You park your car nearby and walk to the ATM. Most of the shops are closed and you can’t see anyone around. While at the ATM someone walks up and stands behind you. You assume they want to use the machine and don’t turn around or give their presence a second thought. After you take your money ($100) the person behind you grabs you in a headlock. You feel something sharp pressing against your back. The person says “Don’t move or scream or else I’ll stab you”. The person reaches into your coat pocket, takes out your phone and throws it on the ground. He says “How much money in your account?” You are so afraid that you can barely speak. You feel sure that the object he’s pressing against your back is a knife. He grips you tighter and says “You wanna die? How much? I’ll know if you lie.” You respond “I don’t know...maybe $200?” “Take it out” he says, “fast”. You do as he says and he grabs the money, pushes you into the ATM with considerable force and runs away. You fall to the ground and stay there for a few minutes, shaken and afraid he might come back. Thankfully you still have your car keys. You get in your car and drive to the police station to report what has happened.
Appendix B: Ethics Clearance

To: A/Prof Ann Knowles, Faculty of Life and Social Sciences
Dear A/Prof Knowles, FLSS
Researchers: A/Prof Ann Knowles, Ms Danielle Williamson
Approved to: 31/12/2009

The above project was given ethical review by a SUHREC Subcommittee (SHESC 2) on 28 November 2008.

I am pleased to advise that your application has been approved as submitted, however, the subcommittee has requested that the recruitment advertisement and consent form be expanded to note that the vignette shown may be distressing to some participants.

The Subcommittee complimented the researchers on the quality of this application, noting that it is comprehensive and well-written. The risks and the support mechanisms are each clearly outlined and the Subcommittee noted that this application would make a good template for other researchers considering international surveys.

The project may now proceed in line with standard ethics clearance conditions here outlined:

- All human research activity undertaken under Swinburne auspices must conform to Swinburne and external regulatory standards, including the current National Statement on Ethical Conduct in Research Involving Humans and with respect to secure data use, retention and disposal.
- The named Swinburne Chief Investigator/Supervisor remains responsible for any personnel appointed to or associated with the project being made aware of ethics clearance conditions, including research and consent procedures or instruments approved. Any change in Chief investigator/supervisor requires timely notification and SUHREC endorsement.
- The above project has been approved as submitted for ethical review by or on behalf of SUHREC. Amendments to approved procedures or instruments ordinarily require prior ethical appraisal/clearance. SUHREC must be notified immediately or as soon as possible thereafter of (a) any serious or unexpected adverse effects on participants and any redress measures; (b) proposed changes to protocol; and (c) unforseen events which might effect continued ethical acceptability of the project.

- At a minimum, an annual report on the progress of the project is required as well as at the conclusion (or abandonment) of the project.

- A duly authorised external or internal audit of the project can be undertaken at any time.

Please contact me if you have any enquiries or concerns about on-going ethics clearance. The SUHREC project number should be cited in communication.

Best wishes for your project.

Aimii Treweek
Secretary, SHESC 2

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Appendix C: Plain Language Statement

Making Sense of Traumatic Events: Investigating Individual Differences in Perceived Control

Danielle Williamson – Doctoral Candidate  
Associate Professor Ann Knowles – Supervisor

Thank you for considering this research project, which aims to explore the ways in which individuals make sense of traumatic events. This study will form the foundation for further research into recovery from criminal victimisation. It is hoped that the results will inform psychological treatment for survivors of traumatic events.

Participation in this study involves completing the following questionnaire, which will take approximately 30 minutes. The questionnaire has two sections. The first section begins with a small number of general questions, asking about your age, gender, education and occupation. You will then complete a variety of measures relating to your current mood and feelings of well-being, your personal experience of traumatic events and a range of personality measures, such as how you explain events and your experiences in close relationships. The second section involves reading a short vignette which asks you to imagine being a victim of armed robbery while at an Automatic Teller Machine. This vignette is followed by a series of questions about the feelings you might have if such an event happened to you. Some people may find the content of the vignette distressing. If this is the case for you, please cease participation in the study. Please respond to all of these sections as without all of the requested information, the analyses underlying this research will not be possible. There are of course no right or wrong answers on any of the items. Do not spend too long on any one item – it is your first response we are interested in.

Your responses to this questionnaire are completely confidential and anonymous. There will be no identifying information accompanying your answers, so that the researchers and other individuals reading the final analysis will have no way of identifying the individuals involved in the study. If the research is published in an academic journal or presented at a conference, only group data will be reported and anonymity will be maintained.

Submission of the questionnaire will be viewed as informed consent and your participation is voluntary. While completing this questionnaire you are entitled to cease participation at any time, and please do so if any discomfort arises. If this research raises issues which you would like to
discuss with a professional, please contact: (Australian participants) the Swinburne Psychology Clinic on (03) 9214 8653, which operates on a low cost fee-for-service basis or Lifeline on 131 114; (Overseas participants) Lifeline International provide free, 24-hour telephone counselling service and support to countries around the globe. Details of how to contact this service in your home country can be found on their website: http://www.lifeline-international.org/looking_for_help.

If you have any general questions about the study, please feel free to contact the senior investigator, Associate Professor Ann Knowles, by email: aknowles@swin.edu.au or phone: (03) 9214 8205.

If you have any concerns about the conduct of this research project, you can contact: Research Ethics Officer, Office of Research and Graduate Studies (H68), Swinburne University of Technology, P O Box 218, HAWTHORN VIC 3122 or phone (03) 9214 5218.

Thank you once again for your assistance in this research. Your time is much appreciated and we hope you find it an interesting experience.