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A PHENOMENOLOGICAL MODEL OF OVERGENERAL MEMORY

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ABSTRACT

Overgeneral memory retrieval (OGM) is defined as a difficulty recalling specific personal memories, and/or the tendency to recall non-specific memories, when asked to recall an event in response to emotional cue words. This research project examined the nature of cognitive processes underlying OGM in individuals with a history of trauma and depression. Regardless of the large body of existing research, the following points remain unclear: the course of OGM (e.g., the mechanisms underlying the maintenance of OGM); the reason why trauma history and depression are particularly relevant to OGM; and the relationships between a history of trauma, depression and OGM. To answer these points, the similarities and differences of OGM in individuals with a history of trauma and depression were examined through a series of studies.

Prior to the main studies, the role of childhood trauma as opposed to adulthood trauma in OGM was examined in Study 1 (Ono & Devilly, 2013) based on the idea that OGM is a developmental memory deficit. As its significant relationship with OGM was found, childhood trauma became the focus of this research project.

The main aim of Studies 2 and 3 was to examine a common cognitive process related to OGM in individuals with a history of trauma and depression (i.e., negative appraisal of self-discrepancy). In Study 2 (Ono & Devilly, 2013), using an Adapted Selves Questionnaire (ASQ), it was examined whether how an individual evaluates one's perceived self-discrepancy negatively affects the ability to retrieve specific memories. The significant effect of negative appraisal of self-discrepancy in OGM was found. This remained significant, even taking into account the effects of trauma history.

Subsequently, in Study 3 the ASQ was examined for its psychometric properties. As very good psychometric properties were found, the role of negative appraisal of the self in childhood trauma and depression was investigated further. Childhood maltreatment was given the focus because of its negative impact on the healthy development of the self and autobiographical memory. Maltreated individuals with depression reported a significantly higher level (magnitude) of self-discrepancies than non-maltreated healthy individuals. The maltreated individuals with depression also evaluated their self-discrepancies (appraisal) significantly more negatively than the healthy controls and maltreated healthy individuals. A high level of negative appraisal of self-discrepancy also significantly predicted a high level of depressive symptoms,

even after incorporating the effects of childhood maltreatment and the magnitude of self-discrepancy. Consequently, negative appraisal of self-discrepancy appeared to be the factor that makes childhood trauma and depression particularly relevant to OGM.

Studies 4 and 5 investigated the differences in OGM among trauma-exposed and depressed individuals (i.e., sample specificity of OGM). In Study 4, the level of OGM was compared via a meta-analytic review. While the results suggest the moderating role of sample characteristics, they were inconclusive, partly due to the small number of studies available to date and various methodological issues. This suggested the need for a study designed to test sample specificity.

In Study 5, the level of OGM was tested for sample specificity and compared among four groups: a control group; a current depression without trauma history group; a childhood maltreatment without past/current depression group; and a childhood maltreatment and current depression group. A high level of OGM was found in response to negative and threat cues when trauma-exposed individuals concurrently reported a high level of depressive symptoms. However, this tendency was not observed in trauma history or depression alone. Therefore, OGM may reflect maladaptive coping among some maltreated individuals, and trauma history and depression may be inseparable when studying OGM effects.

Based on the findings from Studies 1 to 5, a path model of OGM was proposed in Study 6 in which the relationships between a history of childhood trauma, depression and OGM (negative, threat and positive cues) were examined. The proposed model showed a good fit, but the model indicated that different cue sets may lead to OGM through different mechanisms. Childhood maltreatment, rumination, cognitive avoidance and negative appraisal of self-discrepancy had significant direct and/or indirect effects on depression and/or OGM. Consistent with existing theories, OGM appears to be used to regulate depressive mood by maltreated individuals who have maladaptive coping. Individuals' negative evaluation of self-discrepancy is proposed as one of the maintaining factors for OGM and post-trauma depression. The findings support and extend the theories of OGM, the self and autobiographical memory by proposing a potential trajectory from childhood maltreatment to OGM and depression.

STATEMENT OF ORIGINALITY

This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

Miyuki Ono

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LIST OF SUPPLEMENTARY MATERIALS

An Excel Version of the Adapted Selves Questionnaire is included on the CD.

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Japanese proverbs have also helped me maintain a high level of productivity throughout my PhD candidature:

為せば成る 為さねば成らぬ何事も成らぬは人の為さぬなりけり。

*“If you try, you may succeed. If you don’t try, you will not succeed.
Not succeeding is the result of not trying”; and*

継続は力なり。

*“Don’t give up. Just continuing to hold on will yield/reveal strength and
power. Continuing on after a setback is its own kind of strength.
Perseverance is power.”*

Last but not least, I thank my brothers – they had to leave their dreams on the shelf, unrealised, and this created a strong sense of purpose in my life. The premature loss of my brothers always reminds me to *live fully* and *thankfully*.

ACKNOWLEDGEMENTS OF PAPERS INCLUDED IN THIS THESIS

Included in this thesis *Chapters 2, 3, 4, 5* and *6* are papers which are co-authored with other researchers. My contribution to each co-authored paper is outlined at the front of the relevant chapter. The bibliographic details/status for these papers including all authors are shown in the Table below.

Chapter (Study)	Bibliographic Details/Status
Chapter 2 (Studies 1-2)	Ono, M., & Devilly, G. J. (2013). The role of childhood and adulthood trauma and appraisal of self-discrepancy in overgeneral memory retrieval. <i>Cognition & Emotion</i> , 27(6), 979-994. doi: 10.1080/02699931.2012.753869
Chapter 3 (Study 3)	Ono, M., & Devilly, G. J. (Under Review). Adapted Selves Questionnaire: The associations between appraisal of self-discrepancy, childhood maltreatment and adulthood psychopathology.
Chapter 4 (Study 4)	Ono, M., Devilly, G. J., & Shum, D. H. K. (Under Review). A meta-analytic review of overgeneral memory: the role of trauma history, mood and post-traumatic stress disorder.
Chapter 5 (Study 5)	Ono, M., & Devilly, G. J. (Under Review). Sample specificity of overgeneral memory retrieval: Childhood interpersonal trauma and depression.
Chapter 6 (Study 6)	Ono, M., & Devilly, G. J. (In Submission). How trauma and depression are involved in overgeneral memory: A path analysis model.

Appropriate acknowledgements of those who contributed to the research but did not qualify as authors are included in each paper.

_____ (Date) _____

Miyuki Ono

_____ (Date) _____

Supervisor: Associate Professor Grant J. Devilly

CHAPTER 1

Introduction: An Overview and Rationale of Research

Autobiographical memory is the aspect of memory that is concerned with the recollections of personal experiences, which make up one's personal past and sense of self (e.g., Baddeley, 1995; Brewer, 1986; Conway & Pleydell-Pearce, 2000; Rubin, 1986). Disturbances in autobiographical memory retrieval have been found among individuals with a history of trauma and depression (Williams et al., 2007). More specifically, those individuals have been found to show difficulty retrieving specific memories and a tendency to recall stereotypical memories that describe a general summary of events. Such disturbances have been termed overgeneral memory (OGM), and OGM has been implicated in the course (i.e., the development, maintenance and future prediction) of psychopathology among individuals with a history of trauma and depression (Williams et al., 2007). Despite its significant clinical implications, it is still unclear whether and how OGM is present among trauma-exposed individuals without psychopathology. In addition, even though individuals with a history of trauma and depression are known to be the most relevant populations to OGM, it is unclear why these conditions (but not other disorders) are particularly relevant to OGM. Similarly, the relationship between trauma history and depression in the context of OGM remains less clear. The aim of this thesis was: to answer these questions by investigating similarities and differences of OGM in individuals with a history of trauma and depression; and to propose a model that illustrates the link between a history of trauma and depression in the context of OGM. It was believed that the findings would contribute to further understanding of OGM.

In this introductory chapter, autobiographical memory is firstly defined and explained. Emphasis is given to how different aspects of cognitive processes are involved in autobiographical memory retrieval, and how such memories influence and are influenced by one's sense of self based on the Self-Memory System (Conway & Pleydell-Pearce, 2000). Then, studies examining the relationship between OGM and psychopathology are reviewed. Subsequently, the main theoretical accounts of OGM are summarised, from which the current consensus on the mechanisms underlying OGM is derived. Recent empirical findings that suggest similarities and differences of OGM among trauma and depression populations are then reviewed. Finally, the rationale for the current research is stated.

Autobiographical Memory

Memory has been systematically studied for over a century (e.g., Baddeley & Hitch, 1974; James, 1890; Loftus & Palmer, 1974; Miller, 1956; Shiffrin & Atkinson, 1969). Today, based on a large body of research, it is believed that there are different aspects or systems of memory (e.g., declarative vs. procedural), and it is typically defined and studied in terms of the processes involved within each aspect.

Autobiographical memory is an aspect of memory believed to be unique to humans, and, although autobiographical memory has long been acknowledged, its history is relatively short (Tulving, 1972, 2002). Since the first proposal of ‘episodic memory’ (Tulving, 1972), the concept and definition of autobiographical memory have changed (Brewer, 1986, 1996; Conway, 2009; Rubin, 1986, 2006; Tulving, 2002).

Autobiographical memories are generally defined as memories of personal past events and self-knowledge, which are phenomenological and essential for the description and understanding of the self across a lifespan (Baddeley, 1995; Brewer, 1986; Conway & Pleydell-Pearce, 2000; Rubin, 1986; Tulving, 1986). For instance, Rubin (1986) explicitly expressed the close relationship between the self and autobiographical memory: “Autobiographical memory is about the self... Autobiographical memory is the source of information about our own lives, from which we are likely to make judgments about our own personalities and predictions of our own and, to some extent, others’ behaviour” (p. 7). While there has been some disagreement on the definition of autobiographical memory (Brewer, 1986, 1996; Rubin, 1986), the focus in this thesis is autobiographical memory defined as *recollections of personal memory and self-knowledge for specific experiences*. Definitions of phenomena and processes related to autobiographical memory (e.g., episodic memory, working-self, etc.) are provided below under their respective sections.

It should be noted that autobiographical memory is different from other types of memory (e.g., procedural memory) in terms of quality and purpose (Conway, 2009; Howe, 2004; Tulving, 1986, 2002). In terms of quality, the memory contents are reconstructive where personal goals at the time of encoding and retrieval influence the process of memory construction (see Conway, 1996; Conway & Pleydell-Pearce, 2000). In short, autobiographical memory is memory of the self, which in turn, influences what one remembers (Baddeley, 1995; Brewer, 1986; Conway & Pleydell-Pearce, 2000; Rubin, 1986). However, autobiographical memory is believed to play a role not only in

self, but social, directive and emotion regulation domains (Bluck, 2003; Bluck, Alea, Habermas, & Rubin, 2005; Josephson, Singer, & Salovey, 1996). For instance, without autobiographical memory (e.g., remembering past conversations with someone) it would be difficult to maintain a relationship, engage in self-reflection, or direct one's own behaviour in any relationship. Consequently, disturbance in autobiographical memory would have a negative impact on multiple domains of an individual's life. In particular, this would negatively affect one's sense of self, which is an important factor for psychological well-being (Beck, 1979; Ellis, 1961, 1973; Rogers, 1951).

Before reviewing how disturbance in autobiographical memory is related to psychopathology, it is important to understand the reverse: how the self plays an important role in the formation and construction of autobiographical memory. The role of the self in autobiographical memory is outlined based on a prominent model of autobiographical memory, the Self-Memory System (SMS; Conway & Pleydell-Pearce, 2000; Conway, Singer, & Tagini, 2004).

Self-Memory System

The Self-Memory System (SMS) is a model of autobiographical memory that emphasises the reciprocal relationship between the self and memory (Conway, 2005; Conway & Pleydell-Pearce, 2000). According to the SMS, two main components – the *working-self* and *autobiographical memory knowledge* – operate separately and co-jointly in memory formation in the *episodic memory system* (Conway, 2005). The reciprocal relationships between the working-self, the autobiographical memory knowledge and episodic memory systems are believed to influence later memory construction (i.e., recollection of personal experiences). Each system is briefly outlined.

The episodic memory system. The episodic memory system contains specific information of a discrete event that an individual has experienced, which is “sensory-perceptual-conceptual-affective” in nature (Conway, 2005, *p.* 612). Such information typically evokes visual imagery, leading to subjective experience of mentally reliving a past event (Wheeler, Stuss, & Tulving, 1997). Although experiencing an episodic memory (e.g., having breakfast) provides a short-term record of progress in current goal processing (e.g., avoiding repeating the same behaviour), highly detailed records of experiences would strain general cognitive capacity. Therefore, detailed information in

the episodic memory system is lost fairly quickly unless the memory is integrated into the conceptual system (see Conway, 2009).

The Working-Self. The working-self is conceptualised as a set of complex, goal-driven control processes (Conway, 2005; Conway & Pleydell-Pearce, 2000). The control processes (i.e., the working-self) are believed to be part of the working memory system (Baddeley, 1986), and contain three elements: a desired standard or ideal; some evaluation systems for the discrepancy between the desired standard or goal and a current status; and, a means to reducing or increasing the discrepancy (Conway, Singer, et al., 2004). Standards are used for evaluation of the progress of goal attainment / discrepancy and are believed to shape cognitions. In addition, the evaluation of the discrepancy is experienced as an emotion. If the discrepancy is large, negative emotions are expected and the working-self attempts to reduce the discrepancy. In contrast, if the discrepancy is small, an individual may feel bored, and the standard (goal) and/or perceived current situation may be altered to heighten motivation, resulting in an increased discrepancy (Conway, Singer, et al., 2004). It is believed that cognitions (e.g., “I need to get As on all subjects”) and emotions (e.g., heightened apprehension) are linked by goals (e.g., avoiding disapproval from father). This link influences initial construction (e.g., getting all As but Maths) and later reconstruction (e.g., remembering that father criticised Maths being a B while not remembering many As in the report) of autobiographical memories. Thus, the control processes act at initial encoding and memory construction by modulating accessibility (i.e., facilitation vs. inhibition) of autobiographical knowledge and episodic memories, depending on the level of congruence or incongruence of the experience with goals in the working-self (Conway, 2005; Conway & Pleydell-Pearce, 2000; Conway, Singer, et al., 2004).

The Autobiographical Knowledge. The autobiographical knowledge entails knowledge of the self, which is hierarchically organised (from the bottom to the top): general events; life time periods; and life story schemas / themes (see Conway, Singer, et al., 2004). The life story is thought of as being part of the conceptual self, which is abstract self-knowledge (e.g., self-images, attitudes, values, beliefs). This also provides an individual with information about different selves – e.g., the past, current and possible (future) self (Conway, 2005; Conway, Singer, et al., 2004). The conceptual self guides the construction of autobiographical memory in cooperation with the working-self goal structure (Conway, 2009; Conway, Meares, & Standart, 2004).

Relationships between components. The three components of the SMS are in reciprocal relationships, from which autobiographical memories are constructed (Conway, 2005). The reciprocal relationships also determine past, current and (future) possible selves in the autobiographical knowledge. These ‘selves’, in turn, act as the basis for the goal-driven control processes of the working-self and the conceptual self, such as motivation and general goals (Conway & Pleydell-Pearce, 2000). In contrast, the inputs from the autobiographical knowledge and episodic memory system are essential for the conceptual self, as these provide specific examples of the schemas underlying the perception of the self, others, the world, and typical interactions with others (Conway, 2005; Conway, Singer, et al., 2004). Hence, the components influence and are influenced by each other, based on which autobiographical memory is constructed.

Retrieval of specific memories. According to the SMS (Conway, Singer, et al., 2004), there are two competing demands that the working-self balances during memory construction. The first demand is encoding a record of ongoing goal activity for the goal system based on reasonably accurate episodic memories, i.e., *correspondence*. The second demand is maintaining a coherent and stable record of the self’s interaction with the world, based on pre-existing self-knowledge, i.e., *self-coherence* (Conway, 2005; Conway, Singer, et al., 2004). The demand of correspondence aims at grounding the self, or connecting the self to reality by providing the actual experiences stored in the episodic memory system. In contrast, the demand of coherence acts throughout the memory processes (e.g., encoding, retrieving), and aims at maintaining and enhancing current goals, self-images, and self-beliefs stored in the autobiographical knowledge. Thus, in the memory construction process the working-self must balance the demands when the input from the episodic memories (i.e., actual experience, such as “failing an exam”) undermines and threatens the pre-existing self-knowledge in the long-term self (e.g., “I am intelligent”). A healthy individual may utilise strategies to reduce discrepancy (e.g., outweighing, justification, closure) to balance the two demands (Conway, 2005).

While the working-self attempts to balance the two demands, the stable self is vital for an individual to operate the self effectively, achieve goals, and undertake productive interactions with others (Bluck, 2003). Thus, self-coherence may be the predominant force in autobiographical memory (Conway, 2005). For instance, some

experiences, such as a traumatic event, may raise significant challenges to the working-self's ability to achieve this delicate balance. As a result, the demand of self-coherence in long-term self may compromise the accuracy of memories (Conway, Singer, et al., 2004). That is, if an unfavourable memory (e.g., being bullied at school) undermines the autobiographical knowledge base (e.g., "I am lovable"), the working-self may reduce the accessibility of the episodic memory to re-establish a sense of self-coherence (Conway, 2005; Conway, Singer, et al., 2004).

If the working-self completely ignores the demands of adaptive corresponding, this would result in inaccurate (or an inability for) memory construction and, thus, a disconnection of the self from reality. Such phenomenon is usually only seen among individuals with psychological conditions (e.g., psychosis) or following brain damage (Conway, 2005). Similarly, the role that a sense of self (thus autobiographical memory) plays in psychological well-being has been acknowledged (Beck, 1979; Ellis, 1961, 1973; Rogers, 1951). Therefore, it is readily assumed that disturbed autobiographical memory retrieval would be related to psychopathology. This thesis focuses on one type of autobiographical disturbance, called overgeneral memory as outlined below.

Overgeneral Memory

Operational Definition

Overgeneral memory (OGM) is the difficulty retrieving specific memories, and the tendency to recall stereotypical memories. OGM is typically indexed using a cue-recall test, called the Autobiographical Memory Test (AMT; Williams & Broadbent, 1986). In the AMT, participants are shown a series of words, which are positive (e.g., "happy"), negative (e.g., "useless"), or neutral (e.g., "egg") in cue valence. After the presentation of each cue word, participants are asked to report a memory of a specific event of which the cue word reminds them. The responses are typically coded as a specific, categoric, or extended memory, or an omission. A specific memory, as defined by Williams and Broadbent (1986), refers to an event that has happened at a particular place and time and has not lasted longer than a day (e.g., "my wedding ceremony"). In contrast, a categoric memory refers to events that happened repeatedly (e.g., "whenever I see my mum"), and an extended memory represents events that lasted longer than one day (e.g., "last summer holidays"). The total number or proportion of reported specific (or general) memories is regarded as the level of specific (or general) autobiographical

memory retrieval. General memories are most often referred to as categoric memories or an aggregation of categoric and extended memories (Williams et al. 2007).

Regardless of the various definitions of OGM, significant OGM effects in clinical and non-clinical populations have generally been reported.

Overgeneral Memory and Psychopathology

Williams and Broadbent (1986) first found that suicidal individuals retrieve memories that are qualitatively different from healthy controls. This finding has been regarded as an extension of the mood-congruent memory paradigm (Bower, 1981). In the mood-congruent memory paradigm, the *content* or *type* of a retrieved memory was proposed to be congruent with the individuals' current mood. For instance, depressed individuals tend to retrieve negative memories quicker and more often than positive ones (Bower, 1981). The new finding by Williams and Broadbent (1986) was that the *level* of retrieved memories in a suicidal group was significantly more general than in hospital and community control groups.

Following Williams and Broadbent's (1986) seminal proposal, OGM has been studied widely in populations with various clinical presentations, including: suicidal individuals; borderline personality disorders; eating disorders; generalised anxiety disorder; obsessive compulsive disorder; post-traumatic stress disorder (PTSD); and depression (e. g., Dalgleish et al., 2003; Kremers, Spinhoven, & Van der Does, 2004; McNally, Prassas, Shin, & Weathers, 1994; Renneberg, Theobald, Nobs, & Weisbrod, 2005; Wessel, Meeren, Peeters, Arntz, & Merckelbach, 2001; Williams & Dritschel, 1988). However, comorbid depression, or depressive symptoms commonly seen in these clinical populations were often found to be the main correlate of OGM (Arntz, Meeren, & Wessel, 2002; Wilhelm, McNally, Baer, & Florin, 1997). In particular, review papers have reported a large pooled effect size (e.g., Cohen's *d* of 1.12 in Williams et al. 2007) for OGM in individuals with depression or depressive symptoms. Consequently, a significant relationship between depression and OGM has been established.

In contrast, there have been studies indicating the significant relationship of OGM with a history of trauma and trauma-related disorders (e.g., PTSD). OGM effects in PTSD was first reported by McNally, Prassas, Shin, and Weathers (1994), and this has been supported by subsequent studies (Bryant, Sutherland, & Guthrie, 2007; Dalgleish, Rolfe, Golden, Dunn, & Barnard, 2008; Harvey, Bryant, & Dang, 1998; Kleim &

Ehlers, 2008; McNally, Lasko, Macklin, & Pitman, 1995; Moradi, Abdi, Fathi-Ashtiani, Dalgleish, & Jobson, 2012; Moradi et al., 2008; Schonfeld & Ehlers, 2006; Schonfeld, Ehlers, Bollinghaus, & Rief, 2007). These studies investigated the role of PTSD in OGM by comparing the level of OGM in PTSD and trauma-exposed individuals without PTSD. General findings were that individuals with PTSD showed significantly less specific and/or more general autobiographical memory retrieval than trauma-exposed healthy controls. However, studies examining the role of trauma history (e.g., childhood sexual abuse) in OGM among non-clinical populations (Hauer, Wessel, Geraerts, Merckelbach, & Dalgleish, 2008; Henderson, Hargreaves, Gregory, & Williams, 2002; McNally et al., 2006; Raymaekers, Smeets, Peters, & Merckelbach, 2010) also showed medium to large effect sizes (i.e., Hedges' $g = 0.47 - 0.84$). Thus, trauma exposure itself may be related to OGM effects, but a diagnosis of PTSD strengthens this relationship (see also Moore & Zoellner, 2007; Williams et al., 2007 for a review). Based on these follow-up studies, Williams et al. (2007) concluded that depression (and depressive symptoms) and trauma-related conditions are closely associated with OGM.

Nonetheless, the relationship between OGM and depression or depressive symptoms is not always significant (Aglan, Williams, Pickles, & Hill, 2010; Hermans et al., 2004; Jones et al., 1999; Kaney, Bowen-Jones, & Bentall, 1999; Laberg & Andersson, 2004; Stokes, Dritschel, & Bekerian, 2008). Moreover, prospective longitudinal studies found that the level of OGM was stable, despite clinical improvement in depressive symptoms (see Peeters, Wessel, Merckelbach, & Boon-Vermeeren, 2002; Williams & Dritschel, 1988). OGM is also seen in individuals who have recovered from depression, and also in non-clinical samples with a history of trauma who do not necessarily present clinical symptoms (e.g., Burnside, Startup, Rollinson, & Hill, 2004; Crane, Barnhofer, & Williams, 2007; Henderson et al., 2002; Mackinger, Pachinger, Leibetseder, & Fartacek, 2000). Thus, OGM could exist without a current depressive mood. Based on these findings, OGM is believed to be a stable cognitive style (Crane, Barnhofer, Visser, Nightingale, & Williams, 2007), which could be an enduring residual effect of previous adversity, such as past trauma or depression (Brittlebank, Scott, Williams, & Ferrier, 1993).

This enduring residual effect (i.e., OGM) has been implicated in interpersonal problem solving (e.g., Evans, Williams, Oloughlin, & Howells, 1992; Goddard,

Dritschel, & Burton, 1996, 2001; Sutherland & Bryant, 2008b; Williams et al., 2006) and associated with longer recovery times from mental health problems (Brittlebank et al., 1993; Dalgleish, Spinks, Yiend, & Kuyken, 2001; Harvey et al., 1998; Peeters et al., 2002). There have also been studies reporting OGM as a vulnerability factor of symptom development (Gibbs & Rude, 2004; Harvey et al., 1998; Hauer, Wessel, Engelhard, Peeters, & Dalgleish, 2009). Therefore, understanding OGM, in particular how OGM is maintained, has clinical values. In this thesis this is examined by focusing on similarity (i.e., a common factor) and differences of OGM among individuals with a history of trauma and depression.

In parallel to the growing body of research, theoretical accounts have been proposed to explain the mechanisms underlying OGM (see Moore & Zoellner, 2007; Williams et al., 2007). Although the underlying mechanisms are still not fully understood, Williams, et al. (2007) proposed a predominant model called the CaR-FA-X model, which has an acknowledgement of the multiple factors underlying OGM. According to Williams et al. (2007), there are three factors underlying OGM: Capture and Rumination (CaR); Functional Avoidance (FA); and impaired eXecutive capacity and control (X). The CaR-FA-X model is built upon the Self-Memory System (Conway, 2005; Conway & Pleydell-Pearce, 2000; Conway, Singer, et al., 2004), the affect regulation hypothesis (Williams, 1996), and their extensive review data. For an understanding of the current consensus on the mechanisms underlying OGM, the affect regulation hypothesis and the CaR-FA-X model of OGM are summarised below, followed by the review of more recent research findings.

Theoretical Accounts of Overgeneral Memory

Affect Regulation Hypothesis

As mentioned above, Williams (1996) formulated the affect regulation (or trauma) hypothesis to offer an explanation as to which function OGM serves. According to Williams' (1996) affect regulation hypothesis, those who have experienced chronic childhood adversity, or who are especially sensitive to negative emotions, develop a habitual overgeneral memory style. It should be noted that autobiographical memory first emerges in childhood, along with an individual's sense of self (Howe, 2004; Howe & Courage, 1997; Nelson, 1993). Thus, it is logical to assume this habitual memory style to be a consequence of chronic stress during childhood that disrupts the healthy

development of autobiographical memory retrieval (Williams, 1996). In this avoidant coping style, some individuals passively avoid retrieving specific, distressing memories that evoke intense emotions to regulate or minimise the negative emotions related to specific negative or traumatic events (Williams, 1996). Indeed, some studies indicated that OGM lessens the impact of negative emotions associated with a negative event (Hermans et al., 2008; Raes, Hermans, de Decker, Eelen, & Williams, 2003). OGM is also believed to have a reinforcing relationship with ruminative self-focus because the categories used in memory retrieval can become over-elaborated via ruminative self-focus (Williams, 1996). Hence, OGM is seen as an avoidant cognitive style habitually used by some individuals to regulate negative emotions associated with some specific memories, and it is reinforced by ruminative self-focus (Williams, 1996).

Despite its theoretical soundness, the affect regulation hypothesis does not fully account for OGM (Williams et al. 2007). For instance, if the function of OGM is solely to avoid negative emotions attached to specific memories, OGM would be expected to be seen in response to negative cue words, but not positive cue words (i.e., “valence effects”). However, a number of studies found a group difference in the level of OGM in response to *positive*, rather than *negative*, cue words (Croll & Bryant, 2000; Dalgleish et al., 2001; Harvey et al., 1998; McNally et al., 1995; McNally et al., 1994). Subsequently, Williams, et al. (2007) extended their theoretical account into the CaR-FA-X model.

The CaR-FA-X Model

According to Williams et al. (2007), OGM is observed when an individual engages in a top-down (or generative) memory retrieval process. It should be noted that autobiographical memory is organised hierarchically, with lifetime periods as the highest, followed by general events and single events being the lowest (Conway & Pleydell-Pearce, 2000). In addition, the most common point of entry is general event knowledge (Conway & Pleydell-Pearce, 2000; Conway, Singer, et al., 2004). For this reason, generative memory retrieval requires an effortful search that employs self-referent information (“what happened to me when...?”) and the inhibition of irrelevant information and emotions invoked by the retrieval process (“my life has been a mess since”). This process can lead to a re-experiencing of negative life events (e.g., rumination of abstract conceptual self-representation, i.e., CaR), which can deplete the cognitive capacity and control (i.e., X), leading to OGM. In addition, memories that

trigger negative emotions may be avoided (functional avoidance, i.e., FA), in particular, if an individual is sensitive to negative emotions. One of these factors alone or in a combination is believed to lead to OGM (Williams et al. 2007).

The CaR-FA-X model explains the mixed findings of the valence effects in terms of the nature of emotional disorders (Williams et al. 2007). That is, OGM is typically measured using a cued recall task, in which participants are asked to recall a specific memory in response to a series of emotional cue words. However, for individuals with emotional disorders, even positive cues (“happy”) elicit a negative memory because of the lack of positive experiences (“I am not happy”). Thus, similar to the SMS (Conway & Pleydell-Pearce, 2000; Conway, Singer, et al., 2004), it assumes that a specific memory is less likely to be retrieved, if self-referent information triggered by emotional cues highlights a discrepancy between the current standard (e.g., being happy) and actual experiences (e.g., I am unhappy). However, this model extends the SMS by stating that negative emotions derived from a perceived discrepancy would exacerbate emotionally disturbed individuals’ symptoms of rumination, avoidance, and/or impaired executive function and result in OGM (Williams et al., 2007).

Although the efficacy of the CaR-FA-X model has been supported (Sumner, 2012), there remain some questions. Firstly, while Williams (1996) suggested OGM is an avoidant coping style that remains unchanged once repeatedly used, it is still unclear whether and how OGM is present in individuals with a history of trauma without psychopathology. Secondly, even though they are particularly related to OGM, why trauma history and depression are the most relevant conditions to OGM remains unclear. Finally, the relationship between trauma history and depression in the context of OGM is unclear. These questions may be answered by investigating similarities and differences of OGM in trauma-exposed and depressed individuals. More specifically, an investigation of differences in non-clinical individuals with a history of trauma and those with current depression may help in understanding whether and how OGM is maintained without psychopathology. Similarly, an investigation of a common cognitive process among trauma and depression populations may help establish why they are particularly relevant conditions to OGM. It was also believed that a model based on findings from these investigations would be useful for understanding the relationship between a history of trauma and depression in the context of OGM. The model was aimed at illustrating the potential relationships between a history of trauma, OGM, and

depression in non-clinical populations, which would help in understanding the mechanisms underlying the maintenance of OGM.

In the following section, the empirical studies suggesting differences in OGM among trauma-exposed and depressed individuals (i.e., sample specificity) are reviewed, followed by the studies suggesting similarities in OGM among these groups.

Review of Recent Empirical Findings

Sample Specificity

Although relatively recent in OGM literature, there have been studies suggesting differences in OGM effects among trauma and depression populations. For example, a meta-analytic review (van Vreeswijk & de Wilde, 2004) reported that depressed individuals are more likely than non-depressed individuals to exhibit a significantly lower level of specific memory retrieval in response to positive cues. Similarly, Lemogne, Piolino, Jouvent, Allilaire, and Fossati (2006) reported in their review that OGM effects in depression were more evident with positive cues. The results were explained in terms of mood congruence effects (Bower, 1981), whereby depressed individuals are believed to have difficulty in recalling mood incongruent (i.e., positive) specific memories (Lemogne et al., 2006). Thus, OGM in depressed individuals may be more evident in the form of a lack of specific positive memories than a lack of specific negative memories.

In contrast, as suggested in the affect regulation hypothesis (Williams, 1996), it has been reported that trauma-exposed individuals are more likely than their counterparts to report a significantly higher level of OGM to negative cues (Schonfeld et al., 2007). While some studies have suggested sample specificity of OGM, these studies (Schonfeld et al., 2007; van Vreeswijk & de Wilde, 2004) typically did not differentiate depressed individuals from trauma-exposed individuals – only a few researchers explicitly reported both trauma history and depressive symptoms (e.g., Kuyken & Brewin, 1995). For example, van Vreeswijk and de Wilde (2004) included studies that had examined OGM in PTSD. As a result, the large OGM effects in specific positive memory retrieval may not be unique to individuals with depression. For a better understanding of sample specificity, a comparison of OGM between depression and trauma population is important.

Aglan et al. (2010) compared the level of OGM in four groups (healthy control, childhood sexual abuse [CSA] without a history of depression, a history of depression without CSA, and CSA with a history of depression). They found a significantly higher level of categoric negative memory retrieval than categoric positive memory within the 'CSA without depression history' group. Thus, with a direct group comparison, the affect regulation hypothesis was supported in the trauma-exposed group. The level of categoric positive memory retrieval in the 'CSA with depression history' group was significantly higher than that in the 'CSA without depression history' group. No significant group differences were found in the level of categoric memory between the 'depression history without CSA' group, the 'CSA without depression history' group, and the control group. However, individuals in the 'CSA with depression history' group showed a significantly higher level of categoric positive and negative memory than controls (Aglan et al., 2010). Therefore, the 'CSA with depression history' group showed amplified OGM effects in both valences.

Aglan et al.'s (2010) study suggests that OGM effects differ by sample characteristics; however, whether a current depressed mood plays the same function as a history of depression (i.e., a joint and amplifying function with a history of childhood trauma) is unknown. To investigate sample specificity of OGM, the effects of trauma history and depression on the level of both specific and general memory retrieval in response to positive, neutral and negative cues need to be compared. In this thesis, sample specificity of OGM is examined firstly via a meta-analytic review (Study 4), and then via an empirical study (Study 5; see Figure 1).

Commonality of Trauma and Depression that Affects Memory

As previously mentioned, it has been acknowledged that the self influences and is influenced by autobiographical memory (e.g., Baddeley, 1995; Brewer, 1986; Conway & Pleydell-Pearce, 2000; Rubin, 1986) and psychopathology (Beck, 1979; Ellis, 1961, 1973; Rogers, 1951). Firstly, how individuals evaluate the discrepancy between actual experiences and current goals in the working-self influences encoding and construction of autobiographical memory (Conway & Pleydell-Pearce, 2000; Conway, Singer, et al., 2004). However, a sense of self (how individuals evaluate themselves) can be negatively affected by an experience of a traumatic event and depression (Beck, 1979; Brewin, 2006; Horowitz, 1997; Janoff-Bulman, 1992). Thus, disturbed self-evaluation may be a common factor among individuals with a history of trauma and those with

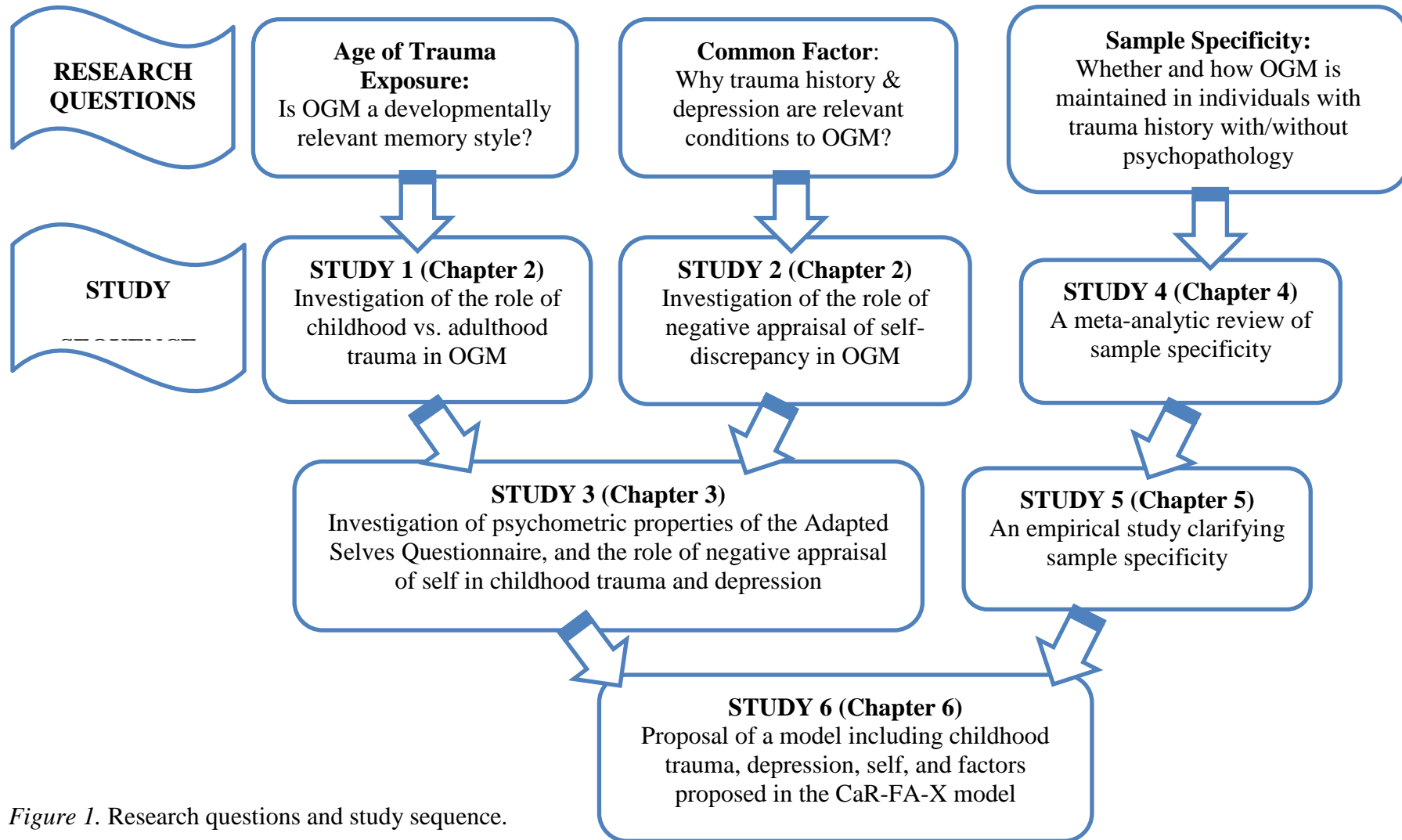


Figure 1. Research questions and study sequence.

depression that affects autobiographical memory retrieval. The Self-Discrepancy Theory (Higgins, 1987; Higgins, Bond, Klein, & Strauman, 1986; Higgins, Klein, & Strauman, 1985) enables researchers to empirically investigate the relationship between the self and depressive mood in the context of life adversity. For this reason, this theory was included for an investigation of similarities among individuals with a history of trauma and depression who exhibit OGM.

The Self-Discrepancy Theory. According to Higgins' (1987) Self-Discrepancy Theory, the self is composed of three different domains: the Actual self (attributes or traits that individuals believe they actually possess); the Ideal self (what individuals desire to be); and the Ought self (what individuals believe they should be – this is typically based on significant others' and societal expectations). These selves are used to elicit possible measures of discrepancy between actual/ideal and actual/ought selves, which is hypothesised to cause increasing emotional distress. Perceived self-discrepancy is believed to have a large, initial, contribution from childhood (negative) experiences, which are accessible when cued by information relevant to the discrepancies held by an individual (Strauman, 1990, 1996). For example, if a cue word (e.g., "lonely") activates an individual's unfavourable actual self-concept, the individual may perceive self-discrepancy by contrasting it with the Ideal self (e.g., "loved"). Hence, self-discrepancy is believed to be a relatively stable perception that develops mainly during childhood and can elicit emotional distress.

The Self-Discrepancy Theory and the SMS are similar since both acknowledge the important role of self-evaluation in emotional responses. Indeed, Conway (2005) pointed out that the conceptual self in the SMS is aligned with self-guides (i.e., Ideal- and Ought-self) in the Self-Discrepancy Theory (e.g., Strauman, 1990). While the SMS (Conway & Pleydell-Pearce, 2000; Conway, Singer, et al., 2004) focuses on the impact of self-evaluation on memory processes, the Self-Discrepancy Theory (Higgins, 1987; Strauman, 1990, 1996) focuses on its emotional consequences.

To quantify individuals' perceived magnitude of self-discrepancy and examine the relationship between self-discrepancy and negative emotions, Higgins (1987) developed the Selves Questionnaire. This measure has been used in clinical samples (Strauman, 1989; Sutherland & Bryant, 2008a) and non-clinical samples (Moretti & Higgins, 1990; Scott & Ohara, 1993). Therefore, the Self-Discrepancy Theory (Higgins, 1987, 1989,

1999) enables researchers to investigate the theoretically assumed relationships between the self, post-trauma coping, depression and memory.

Self-Discrepancy and OGM. Indeed, the relationship between the self and autobiographical memory has been studied in the OGM paradigm (Raes, Schoofs, Griffith, & Hermans, 2012; Schoofs, Hermans, Griffith, & Raes, 2012; Smets, Griffith, Wessel, Walschaerts, & Raes, 2013; Sutherland & Bryant, 2008a; Van den Broeck, Claes, Pieters, & Raes, 2012). For example, Sutherland and Bryant (2008a) investigated the role of self-discrepancy in the *type* of memory recalled in individuals with PTSD. They found that individuals with PTSD reported more trauma-related memories in response to positive cues than trauma exposed non-PTSD individuals, and this tendency was significantly related to the higher levels of Actual/Ideal and Actual/Ought self-discrepancy (Sutherland & Bryant, 2008a). The finding was consistent with the notion that trauma-related memories for individuals with PTSD are more self-defining and accessible than non trauma-related memories (Kangas, Henry, & Bryant, 2005; McNally et al., 1995; Sutherland & Bryant, 2005). The finding also extended the notion above by revealing the involvement of self-discrepancy in the tendency for individuals with PTSD to recall trauma-related memories (Sutherland & Bryant, 2008a). Nevertheless, Sutherland and Bryant's (2008a) study did not report how self-discrepancy was related to the *level* of memory retrieval (i.e., specific vs. general) and, instead, they focused on memory type (i.e., trauma related memories).

Subsequent studies also included the self-discrepancy paradigm. For instance, self-discrepancy has been utilised to induce rumination that was hypothesised to be related to a high level of OGM (Raes et al., 2012; Schoofs et al., 2012; Smets et al., 2013). Self-discrepancy was also used in another OGM study (Van den Broeck et al., 2012) to investigate the role of cue relevance in OGM. However, the focus of these studies was either the role of rumination (Raes et al., 2012; Schoofs et al., 2012; Smets et al., 2013), or cue relevance (Van den Broeck et al., 2012) in OGM. Therefore, the role of self-discrepancy in OGM has not been examined directly. In addition, there has been a methodological challenge for measuring phenomenological self-discrepancy, which is outlined below.

Limitations of the Selves Questionnaire. The Selves Questionnaire (SQ) (Higgins, 1987) allows researchers to empirically examine the relationships between self-discrepancy and emotional distress. However, the SQ involves lengthy

administration (i.e., listing actual, ideal, and ought selves from their own standpoint, and the standpoint of a self-generated significant other), and the coding system has also been criticised (Francis, Boldero, & Sambell, 2006; Tangney, Niedenthal, Covert, & Barlow, 1998). Specifically, in the SQ, researchers compare the attributes listed by a respondent for each pair of self-representations (e.g., attributes listed for actual self and ideal self) and compute the difference between the number of matches (same or synonymous words listed in each self-state) and mismatches (antonymous words listed in each self-state), using a weighting system (see Francis et al., 2006). The more mismatches, the higher the self-discrepancy scores for that pair of self-representations (e.g., actual/ideal). Thus, this procedure is not only time-consuming, but it loses the subjective meaning of perceived self-discrepancy. As argued in the SMS (Conway, 2005) and by other theorists (e.g., Rogers, 1961), perceived discrepancy is phenomenological and is based on *subjective evaluation*. Consequently, the objective scoring of self-discrepancy may not be appropriate in examining the role of self-discrepancy in OGM.

Other researchers also argued that an opposite self-concept to ideal self, namely undesired or feared self (“what I never hope to be” or “what I am fearful of being”), is an important self-concept in emotional distress (Carver, Lawrence, & Scheier, 1999; Ogilvie, 1987). It has been found that the greater the distance between the real self and the undesired/feared self, the greater the perceived life satisfaction – a relationship which was stronger than for actual/ideal self-discrepancy (Ogilvie, 1987). Feared (undesired) self was reported as a more concrete self-construct than ideal self and predicted depressive symptoms (Ogilvie, 1987). Thus, while the contribution of the Self-Discrepancy Theory should not be undervalued, these limitations led to an adaptation of the Selves Questionnaire.

Subsequent measure of Self-Discrepancy. Following the Selves Questionnaire (Higgins, 1987), Hardin and Lakin (2009) established the Integrated Self-Discrepancy Index (ISDI) that employs a subjective rating system and includes the feared self. As with all idiographic methods, there is the assumption that participants possess an idiosyncratic understanding of the attributes generated (Hardin, 2010; Hardin & Lakin, 2009). In this measure, respondents are not asked to generate personal attributes for their actual self, and instead are asked to rate how much their ideal, ought, and feared self are applicable to their actual self from their own and significant others’ perspective. The good psychometric properties of the ISDI have been reported (see Hardin & Lakin,

2009). Hence, the ISDI is a valid and reliable scale based on the Selves Questionnaire and it is designed to measure the phenomenological experience of self-discrepancy.

While the ISDI highlighted the importance of subjective scaling, in order to examine the role of the self (i.e., a common factor) in a history of trauma, depression and memory, it is also important to consider the inclusion of appraisal of self-discrepancy. The importance of appraisal in stress and coping has been proposed by theorists, including Lazarus and Folkman (1984).

The importance of appraisal in stress and coping. According to Lazarus and Folkman (1984), appraisal of a stressor (i.e., perceiving a stressor as positive or challenging vs. a threat) is an important factor for post-stress adaptation and coping. As some researchers (Raes et al., 2006; Williams, 1996) have argued, OGM may be a maladaptive coping or cognitive style. Hence, if a stressor (i.e., perceived self-discrepancies triggered by emotional cues) is appraised as a threat (unmanageable), rather than positive or challenging (manageable), the individual may employ a maladaptive coping strategy (e.g., OGM) during memory recall. The significant role of self-appraisal in psychological (mal)adjustment is not a new concept, and has been suggested by prominent psychologists (e.g., Ellis, 1977). In this thesis the role of the self in OGM was investigated with an adapted measure of self-discrepancy (i.e., ASQ; see Figure 1). The ASQ is a progressive adaptation of the Selves Questionnaire from the ISDI, but this scale includes the appraisal component.

Rationales and Implications of Research

As reviewed above, OGM effects have significant clinical implications; however, whether and how OGM is maintained without current psychopathology (e.g., among individuals with a history of trauma) is unclear. Given that OGM is implicated in the course of psychopathology, understanding how OGM is maintained among non-clinical samples may contribute to an understanding of prevention and intervention of psychopathology. In addition, why a history of trauma and depression are particularly related to OGM remains unanswered. Identification of a common cognitive process that links trauma and depression in the context of OGM may lead to a new and common treatment focus for both trauma exposed and depressed individuals. This may be particularly relevant, given the overlapping symptoms between the two disorders (American Psychiatric Association, 2013) and frequent concurrent presentation of

trauma-related condition and depression (Brady, Killeen, Brewerton, & Lucerini, 2000; Brewin, Dalgleish, & Joseph, 1996; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; O'Donnell, Creamer, & Pattison, 2004). Furthermore, by proposing an extended model in this thesis that illustrates the relationships between a history of trauma, OGM and depression, a potential trajectory from trauma exposure to OGM and depression may be suggested. Consequently, this research project is believed to have theoretical and clinical contributions.

The research questions were investigated through six different studies as briefly outlined below (see full details of the methodology in the subsequent Chapters). Research questions and the study sequence are also visually shown in Figure 1.

Proposal of Studies¹

An Investigation of the Role of Childhood Trauma in OGM (Study 1)

While trauma history is closely related to OGM, the main focus in the OGM literature has been the role of childhood interpersonal trauma, i.e., maltreatment (Aglan et al., 2010; Hauer et al., 2008; Henderson et al., 2002; McNally et al., 2006; Raymaekers et al., 2010; Stokes et al., 2008). Indeed, the younger the age at the onset of trauma, the longer the duration of trauma, and the severity of trauma, have all been found to be significantly correlated with OGM (Burnside et al., 2004; Crane & Duggan, 2009; Hermans et al., 2004). However, as childhood maltreatment has been the focus, it is unclear whether childhood exposure to life adversity contributes to OGM even if the adversity is not necessarily severe and chronic. Based on the affect regulation hypothesis (Williams, 1996), childhood trauma is hypothesised to have a greater negative impact on OGM than adulthood trauma. Nevertheless, there has been no study that directly compared the role of childhood trauma and adulthood trauma in OGM. In order to understand the role of trauma history in OGM (and the course of OGM), it is important to examine whether the age of trauma exposure is important in OGM regardless of the type of trauma. For this reason, the role of childhood trauma in OGM was examined (Study 1, Ono & Devilly, 2013, see Chapter 2) before investigating the similarities and differences of OGM among individuals with a history of trauma and those with depression.

¹ Since the studies are written in the subsequent chapters in full detail for publication purposes, the methodology is only outlined in this chapter.

Commonality: The Role of Self-Appraisal (Studies 2 and 3)

Study 2: The role of negative appraisal of self-discrepancy. One of the research questions in this thesis was to examine a common factor for individuals with a history of trauma and depression in the context of OGM, i.e., negative appraisal of self-discrepancy. This was examined firstly in a pilot study (Ono & Devilly, 2013, see Chapter 2). In this study, the relative contribution that negative appraisal of self-discrepancy plays in OGM was examined by controlling for the variance explained by a history of trauma.

Study 3-1: Psychometric properties of Adopted Selves Questionnaire.

Following Study 2, the aim was to improve the Adapted Selves Questionnaire (ASQ) and examine its psychometric properties via internal consistency, test-retest reliability, and concurrent validity (see Chapter 3). The ASQ was tested on two occasions with a two to three week interval for test-retest reliability.

Study 3-2: The self, childhood trauma and depression. To support the theoretical assumption of appraisal of self-discrepancy as a common factor for trauma-exposed and depressed individuals, the relationships between negative appraisal of self-discrepancy, childhood interpersonal trauma (maltreatment) and depression were examined (in Study 3-2, see Chapter 3). Firstly, the role of a history of childhood maltreatment in predicting the level of perceived self-discrepancy and negative appraisal of self-discrepancy was examined by dividing the participants into three groups: healthy controls; maltreated (no psychopathology); and maltreated with psychopathology (depression) groups. Secondly, the role of negative appraisal of self-discrepancy in predicting the level of depressive symptoms was examined by controlling for the level of childhood maltreatment and the magnitude of self-discrepancy. It was expected that the relationships between negative appraisal of self-discrepancy, a history of childhood maltreatment and depressive symptoms would be clarified.

Sample Specificity of OGM (Studies 4 and 5)

The other focus of this thesis was to examine whether OGM effects are present without psychopathology among individuals with a history of trauma, and how OGM is maintained without psychopathology. To answer these questions, the differences in the

level of OGM between individuals with a history of trauma (with and without psychopathology) and depression (i.e., sample specificity) were examined via two studies.

Study 4: Meta-analytic review. Given the mood-congruent memory effects (Bower, 1981), differences in OGM effects among individuals with a history of trauma and those with depression were expected. For instance, OGM in depression may be more evident in response to positive cue words where individuals with a depressive mood access negative specific memories easily, while being unable to access positive memories. In contrast, such mood-congruent effects are assumed to be absent among individuals with a history of trauma without psychopathology. In addition, it was also of interest to examine whether OGM effects are observed among trauma-exposed, non-clinical individuals. For this reason, a meta-analytic review was conducted (Study 4, see Chapter 4). The effect sizes were pooled from studies examining OGM in trauma-exposed individuals with (e.g., PTSD) and without psychopathology (e.g., childhood sexual abuse) and those with depression (e.g., major depressive disorder).

Study 5: An empirical study for examining sample specificity of OGM. A meta-analytic review (Study 4) suggested sample specificity of OGM, but it also revealed that previous studies were methodologically inconsistent. For this reason, a study with strict selection criteria was conducted subsequently (see Chapter 5), in which the levels of OGM were compared across four groups: the control (no history of trauma or past / current depression); depression only (no history of trauma); a history of trauma only (without past/current depression); and a history of trauma with current depression groups. The results were expected to clarify the question of whether and how trauma-exposed healthy individuals exhibit OGM.

Proposal of Phenomenological Model (Study 6)

Based on the literature review in this thesis, and the results from the studies presented in Chapters 2 to 5, a phenomenological OGM model was proposed in Study 6 (see Chapter 6). The model was based on path analysis and it was aimed at capturing the holistic relationships between a history of childhood trauma, negative appraisal of self-discrepancy, depression, and the three factors proposed in the CaR-FA-X model (Williams et al., 2007) in the context of OGM.

CHAPTER 7

General Discussion

The nature of the cognitive processes underlying autobiographical memory deficits, called overgeneral memory (OGM), was examined in this thesis. This research project consisted of six studies, in which the similarities and differences of OGM among individuals with and without a history of trauma and depressive symptoms were investigated. It was expected that the findings would contribute to further understanding of the mechanisms underlying the course of OGM and relationships between trauma exposure, OGM and depression. In this final chapter the findings from all six studies are reviewed. Overgeneral memory retrieval is discussed in relation to relevant theories, previous study findings, and the findings from this research project. Subsequently, methodological limitations, theoretical and clinical implications, and future directions are discussed.

Study 1: The Role of Childhood Trauma in OGM

The purpose of Study 1 was to test the idea that autobiographical memory disturbance is due to childhood adversities (Williams, 1996; Williams et al., 2007), given that autobiographical memory emerges in childhood (Howe & Courage, 1997; Nelson, 1993). This idea has been supported, but the effect of a history of childhood maltreatment in OGM has been the focus of most literature (Aglan, Williams, Pickles, & Hill, 2010; Hauer, Wessel, Geraerts, Merckelbach, & Dalgleish, 2008; Henderson, Hargreaves, Gregory, & Williams, 2002; McNally et al., 2006; Raymaekers, Smeets, Peters, & Merckelbach, 2010; Stokes, Dritschel, & Bekerian, 2008).

The severity and chronicity of trauma exposure have been reported to be significant predictors of OGM (Burnside, Startup, Rollinson, & Hill, 2004; Crane & Duggan, 2009; Hermans et al., 2004). Some childhood maltreatment can be chronic and severe and negatively affects the child's physical and psycho-social well-being (Arnou, 2004; Stein, Leslie, & Nyamathi, 2002). Hence, it was not clear whether reported OGM was a consequence of a history of chronic and severe trauma and/or childhood adversities. Study 1 examined whether any types of childhood trauma (e.g., natural disaster) have a greater negative impact on autobiographical memory than adulthood trauma. If the effect of childhood trauma on OGM is significantly larger than that of

adulthood trauma, the view that OGM is a developmental memory deficit is supported. The findings were expected to contribute to a further understanding of the course of OGM.

The level of OGM was compared between a no-trauma group ($n = 26$), a group with a history of childhood trauma ($n = 29$), and a history of adulthood trauma group only ($n = 17$) using a non-clinical sample. A mixed between (3 Groups: no-trauma vs. adulthood trauma only vs. childhood trauma) – within (3 Valences: positive vs. negative vs. threat) repeated subjects ANOVA was conducted for specific and general memory retrieval. It was found that individuals with a history of childhood trauma showed a significantly higher level of general negative memory retrieval than those without trauma history. Although there was no significant difference in the level of OGM effects between childhood trauma and adulthood trauma groups, a trend of an increasing level of OGM between the no-trauma, adulthood and childhood trauma groups (in this order) was found in response to negative cues.

The findings are consistent with the affect regulation (trauma) hypothesis (Williams, 1996; Williams et al., 2007). OGM may be a consequence of chronic stress during childhood that disrupts the healthy development of autobiographical memory. However, this study extended previous studies (Hauer et al., 2008; Henderson et al., 2002; McNally et al., 2006) by revealing the effect of general childhood trauma in OGM. As argued in OGM theories, OGM may reflect habitual use of a maladaptive coping style that was originally used to regulate negative emotions associated with repeated traumatic event/s experienced at an early age.

Although the role of childhood trauma history in OGM was observed, it was only in response to negative cues. Indeed, individuals with adulthood trauma history showed a significantly higher level of general threat memories than controls. The results may be partly due to the inclusion of unrestricted types of childhood trauma (e.g., natural disaster) as opposed to the exclusive focus on childhood maltreatment. That is, the severity and chronicity of trauma were not taken into account. Accordingly, the high level of OGM in response to threat cues in the adulthood trauma group may be due to uncontrolled factors (e.g., trauma chronicity, severity etc.). Alternatively, autobiographical memory retrieval in response to general threat cues may be related to

individuals' sensitivity to fear, and this may be prominent amongst individuals with recent exposure to trauma (i.e., those with adulthood trauma).

It should be noted that the majority (i.e., 19/29) of individuals who reported a history of childhood trauma also reported a history of adulthood trauma, and the role of adulthood trauma in OGM in response to threat cues needs further research. Regardless, similar to the notion that OGM lessens the impact of negative emotions associated with a negative event (Hermans et al., 2008; Raes, Hermans, de Decker, Eelen, & Williams, 2003), OGM may also lessen the impact of fear associated with a fearful event. The potential difference of the role of negative versus fear emotions in OGM was further examined in Studies 5 and 6.

Commonality: The Role of Negative Appraisal of Self-Discrepancy in OGM

While a history of trauma and depression are now believed to be the most relevant conditions to OGM (Williams et al., 2007), it is unclear why these conditions are particularly relevant. Studies 2 and 3 were conducted to examine the cognitive factors that are commonly seen among trauma-exposed and depressed individuals.

Study 2: The Relative Role of the Self in OGM. It has been established that childhood adversity disrupts healthy development of the self (e.g., Boudewyn & Liem, 1995; Briere & Rickards, 2007; Crosson-Tower, 2010; Herman, Perry, & Vanderkolk, 1989; Johnson, Cohen, Brown, Smailes, & Bernstein, 1999; McCauley et al., 1997). Indeed, an altered or disrupted sense of self has been proposed as a consequence of traumatic events and/or depression (Beck, 1979; Brewin, 2006; Horowitz, 1997; Janoff-Bulman, 1992). In addition, autobiographical memory is memory of personal past events and self-knowledge (Baddeley, 1995; Brewer, 1986; Conway & Pleydell-Pearce, 2000; Rubin, 1986; Tulving, 1986). Therefore, a disrupted sense of self may be a common factor among trauma-exposed and depressed individuals that affects autobiographical memory retrieval. Accordingly, the role of the self in OGM was examined in terms of negative appraisal of self-discrepancy, using the participants from Study 1 ($N = 73$). A newly Adapted Selves Questionnaire was piloted as a scale measuring the level of self-discrepancy and negative appraisal of self-discrepancy.

A series of hierarchical regressions were employed to examine whether the addition of self-discrepancy indices improved the prediction of a high level of OGM

(i.e., general negative and general threat memory retrieval) beyond that afforded by childhood trauma. It was found that individuals who negatively appraise the similarity between their actual-self and feared-self reported a significantly higher level of OGM than their counterparts in response to negative and threat cues. A unique and significant contribution of negative appraisal of self-discrepancy to OGM in response to negative and threat cues was found (10% and 12%, respectively), even after controlling for the impact of a history of trauma.

Self-discrepancies are believed to be accessible when cued by information relevant to the discrepancies held by an individual (Strauman, 1990). Then, it may be possible that those negative and threat cues reminded individuals of the similarity between their actual-self and feared-self and led them to engage in rumination. That is, based on previous findings (Schoofs, Hermans, Griffith, & Raes, 2012; Schoofs, Hermans, & Raes, 2012), rumination induced by self-discrepancy (in this case, actual-self and feared-self similarity) may have led to OGM. Consequently, appraisal of self-discrepancy and rumination may be the implicit cognitive processes underlying OGM among non-clinical individuals. The relationships between OGM, negative appraisal of self-discrepancy and rumination were examined in Study 6.

Study 3-1: Psychometric Properties. Since the significant role of negative appraisal of self-discrepancy in OGM was found in Study 2, the aim of Study 3-1 was to examine the psychometric properties of the Adapted Selves Questionnaire (ASQ). The ASQ was improved by including a subscale that measures the degree of distress (in addition to the frequency of distress) caused by self-discrepancy (see Supplementary Material for details). The psychometric properties of the ASQ were examined via internal consistency, test-retest reliability, and concurrent validity with a similar measure (i.e., a negative correlation with the Unconditional Self-Acceptance Questionnaire (USAQ; Chamberlain & Haaga, 2001). The ASQ was tested twice with approximately a two to three week interval ($N = 107$ in the first phase, and $N = 66$ in the second phase).

The ASQ demonstrated very good psychometric properties. Firstly, the internal consistency of the appraisal subscales was excellent ($\alpha = .93$, item number = 45), and was much higher than that of the ASQ as a whole (i.e., the magnitude subscale and appraisal subscale; $\alpha = .76$, item number = 60).

Ellis (1961, 1973) emphasised that everyone experiences self-discrepancy, but psychological maladjustment is a consequence of an *evaluation* of the discrepancy between reality and unrealistic standards. The important role of appraisal in coping in response to stress has also been suggested by other theorists (Lazarus, 1991, 1999; Lazarus & Folkman, 1984). Based on the findings from Study 3, the perception of self-discrepancy and appraisal of perceived self-discrepancy may be better understood as related, yet separate, constructs. Secondly, the ASQ reliably measured individuals' self-discrepancy and appraisal of self-discrepancy on different occasions, which also suggests that these are stable phenomenological experiences. As expected, individuals who reported greater self-discrepancy and/or rated the discrepancy more negatively showed a lower level of unconditional self-acceptance than their counterparts. This result supports Ellis's (1961, 1973) view that self-rating of self-discrepancy and unconditional self-acceptance are related, yet opposing, constructs.

In Study 2, the relationship between a history of trauma and negative appraisal of self-discrepancy was not established. The non-significant relationship was thought to be partly due to the type of childhood trauma (i.e., general trauma) being focused on. Childhood maltreatment is believed to negatively affect one's sense of self (Boudewyn & Liem, 1995; Briere & Rickards, 2007; Crosson-Tower, 2010; Herman et al., 1989; Johnson et al., 1999; McCauley et al., 1997). In addition, a history of childhood adversities has been found to be a risk factor for adulthood depression (Kessler, Davis, & Kendler, 1997; Kessler et al., 2010). For this reason, in Study 3-1 the aim was to establish the relationships between childhood trauma, negative appraisal of self-discrepancy and depression by focusing on childhood maltreatment.

Pearson Product Moment correlation analyses revealed significant correlations within the self-discrepancy subscales (i.e., actual/ideal self-discrepancy, actual/ought self-discrepancy, and actual/feared self-similarity). While the level of actual/ideal self-discrepancy significantly related to the level of depressive symptoms (but not anxiety symptoms), the level of actual/ought self-discrepancy was not significantly correlated with the level of anxiety symptoms. The results were not consistent with Higgins and his colleagues (1987; 1985) who proposed that the level of anxiety symptoms would be predicted by the level of actual/ought self-discrepancy. However, the results were consistent with other studies (Francis, Boldero, & Sambell, 2006; Tangney, Niedenthal, Covert, & Barlow, 1998). However, depressive mood and anxiety often co-exist

(O'Donnell, Creamer, & Pattison, 2004; Shalev et al., 1998; Sowislo & Orth, 2013). Therefore, it may be difficult to examine the discriminant validity of the subscales without classifying samples, i.e., individuals with depression without anxiety and those with anxiety without depression. In addition, it was suggested that an overall composite (i.e., total applicability score) provides a robust approach to self-discrepancy. Study 3-1 extended Self-Discrepancy Theory (Higgins, 1987; Higgins et al., 1985) by presenting the associations between the various types of childhood maltreatment and perceived self-discrepancy.

It was found that how negatively one evaluates one's self-discrepancies was significantly related to all types of childhood maltreatment. Such negative appraisal of the self was also significantly related to a higher level (magnitude) of self-discrepancies and depressive and anxiety symptoms. This result is consistent with Mullen, Martin, Anderson, Romans, and Herbison (1996) who found a significant relationship between emotional abuse and low self-esteem. However, Study 3-1 extended previous studies by highlighting the negative impact of emotional and physical neglect on healthy development of the self and demonstrating the relationship between negative appraisal of self-discrepancy and adulthood psychopathology. Consequently, negative appraisal of self-discrepancy is deemed to be a factor closely related to childhood maltreatment, OGM and depression.

Study 3-2: Childhood Maltreatment, the Self and Depression. The relationships between negative appraisal of self-discrepancy, childhood maltreatment and depression were further investigated via two analyses. Firstly, whether the level of negative appraisal of self-discrepancy differs depending on a history of childhood maltreatment and concurrent anxiety and/or depression was examined². The participants were divided into three groups: controls (no history of trauma or current psychopathology, $n = 32$); a history of childhood maltreatment (no current anxiety and/or depression, $n = 20$); or a history of childhood maltreatment and anxiety and/or depression (all reported a clinical level of depressive symptoms, $n = 31$).

One-way ANOVA revealed that maltreated, depressed individuals reported a significantly higher level of perceived self-discrepancy than controls; however, the

² For publication purposes, anxiety symptoms were also focused on in this article, but all maltreated individuals with psychopathology reported at least a moderate level of depressive symptoms.

magnitude of self-discrepancy did not significantly differ from that reported by maltreated, non-depressed individuals. Conversely, maltreated, depressed individuals reported a significantly greater negative evaluation of self-discrepancy than both controls and maltreated, non-depressed individuals. The results were consistent with Ellis' (1961, 1973) view that it is not self-discrepancy itself, but how individuals evaluate self-discrepancy that is the factor significantly related to psychological well-being. Accordingly, it was concluded that while childhood maltreatment may result in a high level of self-discrepancy, post-trauma psychopathology (anxiety and/or depression) depends on how individuals appraise their self-discrepancies.

Following this analysis, negative appraisal of self-discrepancy was examined as an *independent* predictor of (high) levels of depressive symptoms, after controlling for the contribution of the level of childhood maltreatment and the magnitude of self-discrepancy ($N = 107$). It was necessary to examine the unique contribution of negative appraisal of self-discrepancy to depression in order to build a model of OGM in Study 6. The aim of this study was to test the view that it is not the magnitude of self-discrepancy, but how individuals appraise their self-discrepancies that is the important factor in depression. A hierarchical regression analysis was conducted with the level of childhood maltreatment, magnitude of self-discrepancy, and negative appraisal of self-discrepancy being entered in Steps 1, 2 and 3, respectively. The level of depressive symptoms was the dependent variable.

As expected, negative appraisal of self-discrepancy showed a significant independent contribution, explaining an additional 6.4% of unique variance in depressive symptoms. Once negative appraisal of self-discrepancy was entered into the model, the unique contribution of childhood maltreatment dropped significantly (from 29% to 11%), and the unique contribution of magnitude of self-discrepancy became non-significant. Hence, the results further supported the view that negative appraisal of self-discrepancy (rather than the magnitude of self-discrepancy) is the cognitive process significantly related to both a history of childhood maltreatment and depression. While the significant role of childhood maltreatment in adulthood psychopathology has been reported previously (Kessler et al., 1997; Kessler et al., 2010; MacMillan et al., 2001), this study further revealed the significant and independent role of negative appraisal of self-discrepancy in the prediction of the level of depressive symptoms, above and beyond the effects of childhood maltreatment.

Sample Specificity of OGM

While similarities of OGM among individuals with a history of trauma and depression were investigated in Studies 2 and 3, differences of OGM among these conditions (i.e., sample specificity) needed further examination. In particular, a goal of the next phase of research was to explore whether OGM effects are present without psychopathology among individuals with a history of trauma and to explore how OGM is maintained without psychopathology.

Study 4: Meta-Analysis. Previous studies that examined the role of trauma history and depression in OGM were systematically reviewed. A meta-analysis included studies examining OGM in: trauma-exposed, clinical samples (study $n = 7$); trauma-exposed, non-clinical samples (study $n = 8$); and depressed individuals (study $n = 14$). The effect sizes (specific and general memory retrieval in response to both positive and negative cues) pooled from the studies in each criterion (trauma history, PTSD, depression) were compared.

As previously reported in OGM literature (e.g., van Vreeswijk & de Wilde, 2004), methodology varied across studies, e.g., the type and number of cue words used, the definition of OGM, and time allowed to recall. The effect size for OGM in response to negative cues pooled from the studies focused on trauma-exposed, non-clinical individuals was a medium size. However, the pooled effect size for OGM in response to positive cues among trauma-exposed, non-clinical individuals was non-significant. The OGM effects among trauma-exposed individuals were amplified (larger effect sizes) by the presence of PTSD and observed in response to both negative and positive cues. Conversely, depressed individuals tended to show a higher level of OGM in response to positive, rather than negative cue words. This is consistent with studies (Lemogne, Piolino, Jouvent, Allilaire, & Fossati, 2006; van Vreeswijk & de Wilde, 2004) reporting depressed individuals are more likely than their counterparts to show difficulty in recalling mood incongruent, (specific) positive memories.

While the results suggest sample specificity of OGM, there were no significant group differences in the pooled effect sizes. The inconclusive results may be due, partly, to the limitations of this meta-analytic review. For example, it has been reported that a history of depression among trauma-exposed individuals amplifies the OGM effect (Aglan et al., 2010). However, a history of depression among trauma-exposed, non-

clinical samples in the trauma studies had not been reported, and this factor could not be taken into account in this review. In addition, the number of studies included in some meta-analyses was very small. Consequently, these limitations may have led to the inconclusive results. The unsatisfying results led to Study 5 – a study with strict selection criteria, in which the levels of OGM in the control, depression only, trauma history only, and trauma history with depression groups were compared.

Study 5: Sample Specificity of OGM. To clarify the sample specificity of OGM by sample characteristics, strict selection criteria were employed on 199 participants. Of the participants, only those who met the criteria were included in one of the following groups: healthy controls without history of any trauma or depression ($n = 20$); maltreated individuals without current or past depression ($n = 16$); depressed individuals without a history of childhood maltreatment ($n = 19$); and maltreated, depressed individuals ($n = 17$). The group means of the level of OGM in response to positive, neutral, negative and threat cues were compared using a mixed between (4 Groups) – within (4 Valences) repeated subjects ANOVA.

Contrary to the hypothesis, depressed individuals without a history of trauma did not show mood congruent effects (i.e., more specific memory in response to negative cues than neutral cues, and more general memory in response to positive cues than neutral cues). On the other hand, maltreated, depressed individuals retrieved significantly more overgeneral memories in response to negative and threat cues than to neutral cues. Thus, trauma-exposed, depressed individuals may be sensitive to negative and threat stimuli, and avoid retrieving specific memories associated with such emotions. Their sensitivity to threat stimuli, as indicated in their high level of general threat memories, was significantly greater than individuals in the depressed only or trauma only group. As reported in Study 2, OGM effects may reflect a sensitivity to threat stimuli. It was concluded that the OGM effect may reflect some maltreated individuals' maladaptive coping style (avoidance of negative and threat stimuli) following childhood adversities. Such 'maladaptive' coping can be inferred from their high level of depressive symptoms.

Study 5 further supports the OGM theories (Williams, 1996; Williams et al., 2007) and is consistent with studies (Debeer, Raes, Williams, & Hermans, 2011; Hermans et al., 2008; Hermans, Defranc, Raes, Williams, & Eelen, 2005; Raes et al.,

2006) that suggested OGM as a maladaptive coping method following life adversities. However, this study also highlighted the significant sensitivity to fear provoking stimuli among maltreated, depressed individuals. Then, sensitivity to threat cues in maltreated individuals may be a factor related to their anxiety and/or depression. OGM effects in response to threat cues were further examined in Study 6.

Summary of Studies 1 to 5

Based on theories, previous study findings, and the findings from Studies 1 to 5, it is assumed that: OGM may be more likely to be developed as a consequence of traumatic experiences; OGM is used among some maltreated individuals to manage their negative and threat-provoking emotions, and that this maladaptive coping (i.e., OGM) is related to their high level of depressive symptoms. In other words, OGM effects in trauma-exposed individuals are amplified by the presence (or a history) of depression. How negatively individuals evaluate the discrepancy between their ideal/ought/feared selves and their actual self may be the factor mediating the relationship between childhood maltreatment and OGM. This may also be a mediating factor in the relationship between childhood maltreatment and depression.

Based on Self-Discrepancy Theory (Higgins, 1987) and previous OGM studies (Raes, Schoofs, Griffith, & Hermans, 2012; Smets, Griffith, Wessel, Walschaerts, & Raes, 2013), the role of negative appraisal of self-discrepancy in OGM and depression is hypothesised to be a result of rumination. The relationships between childhood maltreatment, the self, OGM and depression were tested separately via a series of studies (1 to 5). However, for an understanding of the direct and indirect effects of factors related to OGM, these relationships needed to be tested in one study. Furthermore, the factors (rumination, cognitive avoidance, and impaired executive control) proposed in the CaR-FA-X model (Williams et al., 2007) needed to be included in the overall picture.

Study 6: A Phenomenological Model of OGM – A Path Analysis

In order to clarify the relationships between the factors above, a path analysis ($N = 172$) was conducted in Study 6. A model was proposed to test a fit with data from three types of OGM (i.e., OGM in response to negative, threat and positive cues). A non-significant chi-square of the models was found for all types of OGM, indicating a good

fit between the model and the data. The good model fit was also supported by other fit indices.

Relationships between a History of Trauma, OGM and Depression. Most pathways were significant. As expected, a high level of negative appraisal of self-discrepancy, rumination, and cognitive avoidance were significantly related to a high level of depressive symptoms. In particular, the role of rumination in predicting cognitive avoidance and depression was significant with a large weight. Negative appraisal of self-discrepancy, rumination, and cognitive avoidance were also significantly related to childhood maltreatment, suggesting a potential mediating role of these factors in the relationship between childhood trauma and depression. The results were consistent with studies that found a mediating role of rumination in the relationship between childhood trauma and depression (Raes & Hermans, 2008).

A mediating role of negative appraisal of self-discrepancy in the association of childhood maltreatment and adulthood depression replicated that found in Study 3. However, as an extension to previous studies, this study found a significant pathway from negative appraisal of self-discrepancy to rumination, which partially³ supports Self-Discrepancy Theory (Higgins, 1987). This suggests that although rumination may be a mediating factor in the relationship between childhood trauma and adulthood depression, this mediating role is also influenced by how negatively individuals appraise their self-discrepancy. In effect, negative appraisal of self-discrepancy has significant direct and indirect effects on depression via rumination (and cognitive avoidance via rumination).

Conversely, there was only one significant incoming pathway to OGM, and the significant predictor/pathway to OGM differed across OGM type (i.e., OGM in response to positive, negative, or threat cues). The results indicate that different cue valences have different relationships with predictive factors (i.e., cue specificity).

Firstly, a high level of OGM in response to negative cue words predicted a low level of depressive symptoms ($p < .05$). A high level of childhood maltreatment, negative appraisal of self-discrepancy, and rumination were significantly related to each

³ Self-Discrepancy Theory suggests that perceived self-discrepancy leads to rumination, whereas this study found a significant relationship between negative appraisal of self-discrepancy and rumination.

other, and they directly and indirectly predict cognitive avoidance. The impaired cognitive control was also significantly related to cognitive avoidance. Therefore, these psychological factors directly and indirectly lead to OGM via cognitive avoidance. However, OGM has been reported to lessen the impact of negative emotions associated with a negative event (Hermans et al., 2008; Raes et al., 2003). Hence, non-clinical individuals who tend to avoid unpleasant thoughts may use OGM to regulate their negative (depressive) emotions induced by emotional cue words. This result is consistent with other theories of OGM (Williams, 1996; Williams et al., 2007).

Secondly, a high level of general negative and positive memory retrieval was significantly predicted by a high level of childhood maltreatment. Thus, regardless of what coping styles are used, maltreated individuals may show a high level of OGM. Although a high level of general positive memory may also be shown in individuals with a high level of rumination. In contrary to the findings from Study 5, there was no significant pathway from OGM in response to threat cues to depressive symptoms. In Study 5, it was interpreted that sensitivity to fear (shown in a high level of OGM in response to threat cues) may be a risk factor for anxiety and/or depression among maltreated individuals. However, this was not found when testing the model. Instead, a high level of childhood maltreatment appears to lead to maladaptive coping styles such as rumination and cognitive avoidance directly and indirectly via negative appraisal of self-discrepancy, resulting in a high level of depressive symptoms. In other words, sensitivity to fear (i.e., OGM in response to threat cues) and maladaptive, post-trauma coping are both derived from a history of childhood maltreatment. Maladaptive coping, but not sensitivity to fear, leads directly to depression.

Finally, a high level of negative appraisal of self-discrepancies was significantly related to a *low* level of overgeneral positive memories. It was inferred that it may be important for non-clinical individuals with a high level of negative appraisal of self-discrepancy to retain specific positive memories for goal attainment in the future (Conway, 2009). There was no significant relationship between OGM in response to positive cues and the level of depressive symptoms. Accordingly, even if an individual appraises self-discrepancy highly negatively, the individual may maintain psychological well-being if positive episodic memories are readily retrieved.

The results supported and extended the Car-FA-X model (Williams et al., 2007) by highlighting the role of negative appraisal of self-discrepancy in OGM and cue sensitivity. As previously suggested (Debeer et al., 2011; Hermans et al., 2008; Hermans et al., 2005; Raes et al., 2006), some maltreated individuals develop maladaptive cognitive styles (rumination and cognitive avoidance), leading to depressive mood. Such negative mood is managed by retrieving overgeneral negative memories. However, a continuous use of OGM may lead to psychopathology (Gibbs & Rude, 2004; Harvey, Bryant, & Dang, 1998; Hauer, Wessel, Engelhard, Peeters, & Dalgleish, 2009).

Research Questions

Firstly, trauma-exposed individuals may exhibit a high level of OGM without current psychopathology if they have experienced depression previously (Aglan et al., 2010). Although a replication is still suggested, trauma-exposed individuals who have never experienced depression may not show OGM (Study 5). In short, OGM appears to be a reflection of maladaptive coping that some trauma-exposed individuals engage in.

Secondly, as found in Study 3, the significant relationships between negative appraisal of self-discrepancy and childhood maltreatment and depression were replicated in Study 6. The final study further identified a significant pathway between negative appraisal of self-discrepancy and rumination, leading to OGM via cognitive avoidance. Based on these findings, it was inferred that negative appraisal of self-discrepancy may be activated by emotional cue words, and heightens pre-existing maladaptive cognitive styles (rumination and avoidance), leading to a high level of OGM. However, cognitive avoidance is also facilitated by the individual's impaired executive control. Thus, alongside executive control impairment, how an individual negatively appraises his or her perceived self-discrepancy may be a maintaining factor for OGM by fostering maladaptive coping styles.

Thirdly, a disrupted sense of self is commonly observed among trauma-exposed and depressed individuals (Beck, 1979; Brewin, 2006; Horowitz, 1997; Janoff-Bulman, 1992). Even though a significant relationship between negative appraisal of self-discrepancy and OGM was not always found, the significant relationships between negative appraisal of self-discrepancy, a history of childhood maltreatment and depression were found in Studies 3 and 6. Study 6 further supported the direct and

indirect effects of negative appraisal of self-discrepancy on rumination and cognitive avoidance. Accordingly, negative appraisal of self-discrepancy may be the factor that makes individuals with a history of trauma and depression the most relevant populations for OGM because of its direct and indirect effects on rumination and cognitive avoidance.

In summary, the model was built based on pre-existing theories of OGM and newly accumulated findings, such as those from Studies 1 to 5. Although most hypotheses in this thesis were supported, methodological issues need to be discussed.

Methodological Limitations

Sample Selection. Even though the use of non-clinical samples was justified, the gender ratio (female > male), education level, and the mean age of university student samples used in this research project were not representative of non-clinical samples. Consequently, the results may not be applicable to all non-clinical samples. For instance, impaired executive control may not be commonly observed among university students, given that tertiary education requires a high level of executive functioning (e.g., planning). In other words, maltreated university students may be relatively high-functioning among all maltreated individuals. Accordingly, future research needs to employ representative non-clinical samples for the generalisation of the findings.

Measurement Issues. In addition to sample selection, there are measurement issues that need to be discussed. First, some researchers proposed that the overgeneral memory that the AMT measures consists of one factor (J W Griffith et al., 2009; James W. Griffith, Kleim, Sumner, & Ehlers, 2012). Thus, although the focus of this thesis was the role of cue valence in OGM, the issue of reliability of the AMT needs to be acknowledged. In Chapter 2, 15 years old was used as a cut-off for childhood trauma. However, this cut-off point was derived from the trauma literature (Cook, Ciorciari, Varker, & Devilly, 2009), and this cut-off age may not accurately represent the critical age of autobiographical memory development. In addition, rumination was conceptualised as a tendency (*trait*) to ruminate. However, rumination that is related to OGM may be a *state* of rumination induced by cue words that highlight self-discrepancy (Raes et al., 2012; Schoofs, Hermans, Griffith, et al., 2012; Smets et al., 2013). Thus, although the non-significant relationship between rumination and OGM may be the characteristics of non-clinical samples, it may also be due to the

conceptualisation of ‘rumination’ as trait rumination. In future research, it would be helpful to include scales that measure trait and state rumination when testing the model with non-clinical samples.

Furthermore, a list of personal attributes was not provided to the participants while completing the ASQ to avoid priming effects. However, clinical populations or young populations (e.g., adolescents) may have difficulty in completing the ASQ without a list of personal attributes from which they can select their ideal, ought and feared selves.

Although Study 6 suggested a potential trajectory from childhood maltreatment to OGM and depression, this was a cross-sectional study. Consequently, causal relationships can be inferred but cannot be established. In addition, to make the model parsimonious, the relationships between factors in the model were depicted as one-way, from childhood maltreatment, through maladaptive coping, to OGM and depressive mood. However, OGM and depression may also contribute to maintain negative appraisal of the self, rumination and cognitive avoidance. Indeed, a reciprocal relationship between OGM and rumination (Williams, 1996; Williams et al., 2007) and between a disturbed sense of self and depression (Beck, 1979) have been suggested. Therefore, the model in Study 6 is a simplified representation of these factors, and further research is warranted.

Regardless of the limitations, this research contributed to further the understanding of OGM, and theoretical and clinical implications of the findings are now discussed.

Theoretical Implications

The foremost theoretical contribution of this research project was identifying an additional factor significantly related to OGM: negative appraisal of self-discrepancy. The studies in this thesis consistently supported theories of OGM (Williams, 1996; Williams et al., 2007): OGM is developmentally relevant; OGM is a result of maladaptive coping (e.g., cognitive avoidance) among individuals with childhood maltreatment; OGM is used to regulate negative emotions; and the three factors proposed in the CaR-FA-X model were directly and indirectly related to OGM effects. Similarly, the findings supported the theories that suggested the importance of the

appraisal process in memory retrieval (Conway & Pleydell-Pearce, 2000; Conway, Singer, & Tagini, 2004) and in psychological adjustment and coping (Ellis, 1961, 1973; Lazarus, 1991, 1999; Lazarus & Folkman, 1984). In addition, Study 6 clarified the relationships between childhood maltreatment, self, rumination, avoidance, OGM and depression. The findings supported Self-Discrepancy Theory (Higgins, 1987) that suggested the negative impact of childhood adversity on self-discrepancy resulting in rumination and emotional distress. Consequently, this research project extended the theories above by including the appraisal of self-discrepancy, which integrates the theories into one model that outlines a potential trajectory from childhood maltreatment to post-trauma coping, OGM and depression. For this, the ASQ is a valid and reliable scale to explore a patient's phenomenological experience of self.

Clinical Implications

The research findings in this thesis support the notion that not all maltreated individuals show a high level of OGM or depressive symptoms – OGM and depression indicate a high level of maladaptive coping with childhood maltreatment. It was found that negative appraisal, rumination, and cognitive avoidance may be mediating factors in the relationship between childhood maltreatment and adulthood depression and the relationship between childhood maltreatment and OGM. In other words, both OGM and depression are directly or indirectly predicted by a history of childhood maltreatment because of their common cognitive processes (i.e., negative self-appraisal, rumination, and avoidance). This suggests that even without a direct relationship between OGM and depression, the levels of OGM and depressive symptoms may change simultaneously due to changes in their shared cognitive processes (i.e., maladaptive coping). Hence, an intervention focusing on maladaptive coping styles may be effective in treating maltreated, depressed patients. In particular, negative appraisal directly and indirectly influences rumination and cognitive avoidance. Therefore, an intervention focusing on negative appraisal of self-discrepancy may lead to a reduction of depressive symptoms and a decrease of OGM among maltreated individuals.

Future Directions

In future research, replication of Study 6 with representative non-clinical and clinical samples is important before the findings are applied to clinical settings. In addition, a longitudinal study examining the relationship between the factors included in

the model (i.e., childhood maltreatment, negative appraisal of self-discrepancy, rumination, cognitive avoidance, executive control, OGM and depression) would be useful for further understanding of the course of OGM. Particularly, a longitudinal study focusing on the factors that differentiate maltreated healthy individuals from maltreated individuals with anxiety and/or depression would be beneficial (e.g., the factor related to the reason why some maltreated individuals *do not* develop negative appraisal).

Concluding Comments

It is concluded that OGM may be a direct effect, or one of the end results of, childhood maltreatment. More specifically, OGM appears to be used to regulate negative emotions among some maltreated individuals, while a high level of general threat memories may reflect sensitivity to threat stimuli that is a direct effect of childhood maltreatment. How (negatively) individuals evaluate their self-discrepancy was significantly related to a history of childhood maltreatment, rumination, cognitive avoidance, and OGM – both directly and indirectly. In addition, negative appraisal of self-discrepancy was found to be a relatively stable cognitive process that significantly predicts the level of depression, over and above the unique contribution of childhood maltreatment. Hence, negative appraisal of self-discrepancy may be a maintaining factor for OGM and post-trauma depression by fostering rumination and cognitive avoidance. Furthermore, individuals' negative appraisal of self-discrepancies is common among trauma-exposed, depressed individuals. Therefore, negative appraisal of self-discrepancy may be the common cognitive factor that makes individuals with trauma history and depression particularly susceptible to OGM.

This research project consistently supported theories of memory, OGM, and the self, but it also extended these theories. More specifically, findings in this research project added an insight into the trajectory from childhood maltreatment to OGM and adulthood depression, in which negative appraisal of self-discrepancy plays a significant role. Consequently, negative appraisal of self-discrepancy may be a valuable factor in the treatment of maltreated patients' OGM and depression.

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APPENDIX A
Information Sheet and Consent Package (Studies 1 – 2)



Information Sheet
University

School of Psychology

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Mt Gravatt Campus, Griffith

Brisbane, Queensland 4111, Australia

Investigation of factors related to autobiographical memory recall

Principle Researcher:

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Griffith University, Mt Gravatt Campus

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Miyuki Ono

PhD Candidate

Griffith University, Mt Gravatt Campus

Email: m.ono@griffith.edu.au

This project is being conducted as part of Melissa Holman's Honours research project (6000PSY) and Miyuki Ono's PhD study. The study will also form the basis for publication in the scholarly literature. Please read this Participant Information Sheet carefully, and ask any questions concerning the information in this document. This Information Sheet is for you to keep.

Purpose of the study:

The purpose of this project is to investigate factors related to autobiographical memory. Autobiographical memory is memory for events you have personally experienced (for example; what you did on your last birthday). It is hoped that through this experiment we will be able to identify whether certain psychological factors impact an individual's autobiographical memory recollection.

Method and Duration of Testing:

Individuals who agree to participate in the study will first be required to complete a small number of questionnaires. These questionnaires will ask participants about how they see their actual and ideal selves, as well as their feelings of stress, and about any distressing (ie. traumatic) experiences they have faced. No identifying information will be collected on participant's questionnaires or tests and thus the data gathered will be completely anonymous. Participants will then engage in a memory test where they are

required to recall memories to cue words. Next, participants will be hooked up to a device to measure heart rate and Galvanic Skin Response, and some participants will be allocated to a group that may receive electrical nerve stimulation. This stimulation will not be very painful and will not cause you any permanent physical harm. Participants will then engage in another memory test. Overall the study will take approximately 60 minutes. Participants will then be compensated for their time with 1 credit point.

Possible Risks:

It is important to remember that no identifying information will be gathered on participant responses and therefore, your responses will remain completely anonymous. As this study is in part concerned with distressing events of the individual (ie. previous trauma and history of depression) it is possible that your participation in this study could cause some emotional distress. Additionally, it is also possible that participants assigned to the nerve stimulation group may find this procedure distressing. Thus, if for any reason you become particularly distressed the study will be stopped immediately. It is important participants understand that participation in the study is voluntary, and you are free to withdraw at any time. In addition, possible referral agencies are cited at the end of this information sheet.

Possible Benefits:

Students who participate in this experiment will receive one course credit point for their involvement. The findings are expected to provide information about different influences on memory recall. However, there may be no personal benefits from taking part in this study.

Confidentiality:

Your participation in this study is completely anonymous. No identifying information will be gathered that can link your responses to you. All information gathered will be stored in locked filing cabinets at Griffith University (Mt Gravatt Campus), and will be accessed only by the researchers.

Participation is Voluntary:

Your participation in this study is voluntary. If you agree to participate, but change your mind, you are free to withdraw from the study at any time without explanation. Withdrawing consent to participate in this research will not result in any penalty to you.

Questions and further information:

If you have any questions concerning this study or would like further information on the research please feel free to contact Associate Professor Grant Devilly at g.devilly@griffith.edu.au or on 3735 3309.

Email addresses will be gathered from those participants who wish to receive feedback on the study. Email addresses will be kept separate from participant's responses to ensure anonymity.

The Ethical Conduct of this Research:

Griffith University conducts research in accordance with the National Statement on Ethical Conduct in Human Research. If participants have any concerns or complaints about the ethical conduct of the research project they should contact the Manager, Research Ethics on 3735 5585 or email at research-ethics@griffith.edu.au

Contact Numbers for Assistance:

If you feel you require any assistance after this study please feel free to contact any of the listed researchers. Additionally, below are a number of services you can contact.

Student Counselling Services

- Mt Gravatt - (07) 3735 5669
- Nathan - (07) 3735 7470
- Gold Coast - (07) 5552 8734

Lifeline: 13 11 14

Beyondblue: 1300 22 4636

Australian Psychological Society (for referral): 1800 333 497

Thank you for your help with this research.



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Consent Form
University

Mt Gravatt Campus, Griffith
Brisbane, Queensland 4111, Australia

Investigation of factors related to autobiographical memory recall

By signing this form, I confirm that I have read and understood the Participant Information Sheet:

I understand that participating in this study will include;

- completing a small number of questionnaires that will ask me to list personality traits that apply to me, as well as ask about my feelings of stress, and about any distressing experiences I have faced (ie. trauma, and history of depression)
- participating in two separate memory tests
- having my heart rate measured
- and possibly being allocated to a group that receives electrical nerve stimulation;

I understand that my participation in this study is voluntary and that I can withdraw without explanation or penalty at any time;

I understand that no personally identifying information will be gathered on my questionnaires or tests and therefore, my responses are anonymous and cannot be linked to me. Thus, I also understand that I cannot have my particular responses removed from the research once I leave the room, unless I make a mark below which is specific to me, is not personally identifying, but can be used by me to have my data withdrawn at a later date, should I so desire this.

I understand the potential risks of this study;

I understand that the information gathered for this study will form the basis of an honours thesis and PhD study and that this data may also be published in academic articles;

Any questions I have had regarding this study have been answered to my satisfaction;

I understand that I can contact The Manager, Research Ethics, at Griffith University Human Research Ethics Committee on 3735 5585 (or research-ethics@griffith.edu.au) if I have any concerns about the ethical conduct of the project; and

I agree to participate in this study.

.....
Participant's Mark (an x is acceptable)

.....
Date

.....
Investigator

.....
Date

APPENDIX B

The Selves Questionnaire (Study 2)

You will be asked to list qualities that you might apply to yourself. You will be asked to list these for three different types of self:

- Your “**IDEAL** self:” Traits that you would **IDEALLY** like to possess; the type of person you **wish, desire, or hope** to be
- Your “**OUGHT** self:” Traits that you think you ought to possess; the type of person you have a **duty, obligation, or responsibility** to be; the traits you are **morally obligated** to possess
- Your “**FEARED** self:” Traits that, in general, you do **NOT** want to possess, traits that you **fear being**

How are the ought and ideal self different?

Here is an example of how the ideal and ought selves are different: I may hope to be rich someday, being rich may be a goal I have for myself, but I do not think I have a duty or a moral obligation to be rich. So, rich would be a word that describes the type of person I ideally want to be, but it is not a word that describes the type of person I think I should be.

Is the ought self just more realistic than the ideal self?

No, not necessarily. Everyone differs in how realistic the traits of the ideal and ought selves are, as well as how much they actually possess those traits. For you, just think about who you ideally want to be and who you think you should (i.e., ought to) be, not about which one is more realistic.

For each list, think carefully about the type of qualities you are being asked to list. You may use any words you want to describe these different types of self.

Please list **5** traits or attributes associated with the following self-state:

Ideal self: Your beliefs concerning the attributes you would ideally like to possess; your ultimate goals for yourself.

Note: Please disregard columns a & b for now

5 traits/attributes	a	b
	Describes me	Difference bothers me
	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u> completely well somewhat slightly not at all	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u> Never rarely sometimes often always
	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u>	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u>
	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u>	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u>
	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u>	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u>
	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u>	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u>
	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u>	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u>

Please list **5** traits or attributes associated with the following self-state:

Ought self: Your beliefs concerning the attributes you believe you should or ought to possess; your normative rules or prescriptions for yourself.

Note: Please disregard columns a & b for now

5 traits/attributes	a					b				
	Describes me					Difference bothers me				
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
	completely	well	somewhat	slightly	not at all	Never	rarely	sometimes	often	always
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>

Please list **5** traits or attributes associated with the following self-state:

Feared self: the kind of person you *fear* being or *worry* about being. It's defined by the personality traits you think you might become in the future but that you'd rather *not* become. It's not necessary that you have these traits, only that you want to avoid having them.

Note: Please disregard columns a & b for now

5 traits/attributes	A	b
	Describes me <u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u> completely well somewhat slightly not at all	Similarity bothers me <u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u> Never rarely sometimes often always
	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u>	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u>
	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u>	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u>
	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u>	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u>
	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u>	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u>
	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u>	<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u>

INSTRUCTION FOR COLUMNS a & b

Now, we would like you to answer some questions in Columns a and b about each of the traits you have listed.

COLUMN a: Applicability to your Actual Self

Please indicate the extent to which you think each of the words actually describes or applies to you *at this time* using a 5-point rating scale, in which:

- 1 = Completely describes me (i.e., no difference)
- 2 = Describes me well
- 3 = Describes me somewhat
- 4 = Describes me slightly
- 5 = Does not apply to me at all (i.e., the greatest difference)

COLUMN b: Disturbance by Difference or Similarity between two Selves

For each attribute, please indicate how often the difference between your **Ideal Self** and **Actual Self**; and your **Ought Self** and **Actual Self** bothers you and/or threatens your sense of self. For each attribute of your **Feared Self**, please indicate how often any similarity to your **Actual Self** bothers you or threatens your sense of self, using the 5-point rating scale below:

- 1 = never
- 2 = rarely
- 3 = sometimes
- 4 = often
- 5 = always

SELF-LIKING SCALE

Lastly, please think about your "**Actual Self**", traits that you think you actually possess *at this time* and rate how much you like your "**Actual Self**" using a 100-point rating scale, ranging from 0 = absolutely hate my Actual Self to 100 = absolutely love my Actual Self.

Self-Liking Score _____

APPENDIX C

Materials Used for Selection of Words for Emotional Stroop Test

**School of Applied Psychology**

Telephone +61 (07) 3735 3333

www.griffith.edu.auMt Gravatt Campus, Griffith University
Brisbane, Queensland 4111, Australia*Word Categorisation, Valence and Arousal***Student Investigator:**Miyuki Ono. Clinical PhD Candidate, Griffith University. Phone: (07) 3735 3383; Email: miyuki.ono@griffithuni.edu.au**Supervisors**Associate Professor Grant Devilly
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3735 3309; Email: g.devilly@griffith.edu.auProfessor David Shum
Griffith Health Institute and School of
Applied Psychology, Griffith
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d.shum@griffith.edu.au

This study is being conducted as part of Miyuki Ono's PhD study. The study will also form the basis for publications in the scholarly literature.

Purpose of the study:

Despite there being a number of affective word lists in the literature, these lists do not necessarily differentiate negative words from trauma-related words. However, it is of interest whether or not trauma-related words elicit different reactions from negative, positive and neutral words in traumatised individuals. To investigate such an effect, it is important to use words that are classified accurately into each category (i.e., positive, negative, trauma-related or neutral). Therefore, the aim of this study is to differentiate positive, negative, trauma-related, and neutral words as well as to examine each word's emotional valence level (i.e., how positive or negative it is) and arousal level (i.e., the intensity of emotion generated by the word). The results of this pilot test will be used in a cognitive test in Miyuki Ono's PhD research project.

Method and Duration of Testing:

Individuals who agree to participate in the study will first be required to fill in a Demographics Sheet before completing a questionnaire asking about how they categorise words. Participants will also be asked to rate the valence of each word on a bipolar continuum scale of 1: very negative to 9: very positive as well as to rate the arousal (intensity) level of each word on a single axis scale of 1: neutral to 9: maximally arousing. Overall the study will take approximately 15 minutes.

Pre-requisite of Participation:

Being a native English speaker is required (a bilingual individual is also acceptable if both language skills are equally sufficient).

Possible Risks:

There is no foreseeable risk to participants. However, if for any reason you become particularly distressed the study will be stopped immediately. It is important participants understand that participation in the study is voluntary, and you are free to withdraw at any time without providing us with any explanation.

Possible Benefits:

The findings are expected to provide information about different influences on memory recall. However, there may be no personal benefits from taking part in this study.

Voluntary & Confidential Participation:

Your participation in this study is voluntary. If you agree to participate, but change your mind, you are free to withdraw from the study at any time without explanation. Withdrawing consent to participate in this research will not result in any penalty to you.

Your participation in this study is also completely anonymous. No identifying information will be gathered that can link your responses to you. All information gathered will be stored in locked filing cabinets at Griffith University (Mt Gravatt Campus), and will be accessed only by the researchers.

To preserve confidentiality and emphasise the voluntary nature of the research, we do not require a signed consent form from you. Consent will be deemed implied by the completion and return of the questionnaire. However, this does mean that once you hand-in your questionnaire it cannot be retrieved, as we will have no way of identifying which was yours.

Questions and further information:

If you have any questions concerning this study or would like further information on the research please feel free to contact Associate Professor Grant Devilly at g.devilly@griffith.edu.au (tel: 3735 3309).

The Ethical Conduct of this Research:

Griffith University conducts research in accordance with the National Statement on Ethical Conduct in Human Research. If participants have any concerns or complaints about the ethical conduct of the research project they should contact the Manager, Research Ethics on 3735 5585 or email at research-ethics@griffith.edu.au

Participant Demographics

1. Age (in years): _____
2. Gender (please circle): Male or Female
3. Ethnicity (Please circle the ethnic group you most identify with)
 - a. Australian
 - b. White/Caucasian/Northern European
 - c. Aboriginal or Torres Straight Islander
 - d. Asian
 - e. Hispanic
 - f. Middle Eastern
 - g. Other _____ (please identify)
5. What is your highest level of education? (Please circle)
 - a. Less than high school
 - b. High school (year 12) completed
 - c. Some college (no degree, e.g., TAFE)
 - d. Diploma
 - e. 2 year college degree
 - f. 4 year college degree
 - g. Master-level degree (e.g., MS, MA etc)
 - h. Doctorate-level degree (e.g., PhD, M.D. etc)
6. Total years of education completed _____ years
7. Would you describe yourself as having experienced a history of trauma? (Please circle)
 YES or NO
8. Would you describe yourself as having been emotionally affected by a history of trauma? (Please circle **one** of the three options below)
 YES, BUT NOT ANY LONGER or YES, AND STILL AM or NO

Word	Word Category (Please circle one category)				Valence (Please circle one)									Arousal								
					1 2 3 4 5 6 7 8 9 Very negative Neutral Very positive			1 2 3 4 5 6 7 8 9 Neutral Arousing Maximally Arousing														
Cheer	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Failure	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Basket	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Danger	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Guilty	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Context	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Disaster	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Custom	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Fear	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Excellence	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Hurt	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Horror	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9

Word	Word Category (Please circle one category)				Valence (Please circle one)									Arousal								
					1 2 3 4 5 6 7 8 9 Very negative Neutral Very positive			1 2 3 4 5 6 7 8 9 Neutral Arousing Maximally Arousing														
Happy	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Lonely	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Journal	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Rejected	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Machine	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Lucky	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Injury	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Pencil	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Mutilate	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Sad	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Nightmare	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Miracle	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9

Word	Word Category (Please circle one category)				Valence (Please circle one)									Arousal								
					1 2 3 4 5 6 7 8 9 Very negative Neutral Very positive			1 2 3 4 5 6 7 8 9 Neutral Arousing Maximally Arousing														
Selfish	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Sphere	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Sin	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Museum	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Terrified	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Paradise	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Stupid	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Umbrella	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Trauma	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Rainbow	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Windmill	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Victim	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9

Word	Word Category (Please circle one category)				Valence (Please circle one)									Arousal								
					1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
					Very negative			Neutral			Very positive			Neutral			Arousing			Maximally Arousing		
Success	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Unhappy	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Joyful	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Torture	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Chair	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Rape	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Abuse	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Affection	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Confused	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Suffocate	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Victory	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Barrel	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9

Word	Word Category (Please circle one category)				Valence (Please circle one)									Arousal								
					1 2 3 4 5 6 7 8 9 Very negative Neutral Very positive			1 2 3 4 5 6 7 8 9 Neutral Arousing Maximally Arousing														
Hell	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Upset	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Betray	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Cash	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Killer	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Loved	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Depressed	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Clock	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Avenue	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Suicide	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Win	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Hatred	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9

Word	Word Category (Please circle one category)				Valence (Please circle one)									Arousal								
					1 2 3 4 5 6 7 8 9 Very negative Neutral Very positive			1 2 3 4 5 6 7 8 9 Neutral Arousing Maximally Arousing														
Delight	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Useless	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Tragedy	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Item	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9
Poison	Pos	Neg	Neu	Tra	<u>1</u>	2	3	4	5	6	7	8	9	<u>1</u>	2	3	4	5	6	7	8	9

THANK YOU FOR YOUR TIME!

APPENDIX D

Information Sheet and Consent Package (Studies 3, 5, and 6)



Information Sheet
University

School of Applied Psychology

Telephone +61 (07) 3735 3333

www.griffith.edu.au

Mt Gravatt Campus, Griffith

Brisbane, Queensland 4111, Australia

Investigation of factors related to autobiographical memory recall

Student Investigator:

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Email: miyuki.ono@griffithuni.edu.au

Supervisors

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Griffith Health Institute and School of
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Phone: (07) 3735 3309; Email:
g.devilly@griffith.edu.au

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Griffith Health Institute and School of
Applied Psychology, Griffith
University. Phone: (07) 3735 3370; Email
d.shum@griffith.edu.au

This project is being conducted as part of Miyuki Ono's PhD study. The study will also form the basis for publications in the scholarly literature. Please read this Participant Information Sheet carefully, and then ask any questions concerning the information in this document. This Information Sheet is for you to keep.

Purpose of the study:

The purpose of this project is to investigate factors related to autobiographical memory. Autobiographical memory is memory of events you have personally experienced (for example; what you did on your last birthday). It is hoped that through this experiment we will be able to identify whether certain psychological factors impact on an individual's autobiographical memory recollection.

Method and Duration of Testing:

Individuals who agree to participate in the study will be required to complete a number of questionnaires. These questionnaires will ask participants to list the ways in which they see themselves and how they would like to be seen, as well as past and current feelings of negative affect (i.e., depression and anxiety) and whether they have experienced any distressing (i.e., traumatic) experiences and whether these experiences caused any distress or dysfunction. Examples of traumatic incidents include car crashes, war experiences, child or adult abuse. Examples of distress include the inability to keep memories of the events out of your mind, poor concentration and avoiding things which remind you of the events. In particular we will be asking about any history of trauma during childhood – emotional, sexual and physical.

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Other questionnaires include those asking participants to report on cognitive styles, personality traits, and self-perception. Cognitive styles are ways of mentally coping with adversity (i.e., what do you do to cope with stress), while self-perception measures the degree to which you are happy with your way of interacting with the world. There will also be two kinds of cognitive tests – a memory test and a colour perception test. In the memory test participants are required to recall memories prompted by cue words (e.g., the word “table” being presented to you may lead you to recount a memory of a scenario in which your friend fell off a table last Saturday). The colour perception test asks participants to identify the colour of stimuli – so you may be shown the word “table” with red writing and be asked to hit a red button (if it were green, you would hit the green button, etc).

No identifying information will be collected on participant’s questionnaires or tests and thus the data gathered will be completely anonymous. Overall, the study will take approximately 90 minutes. Participants will be compensated for their time with 1.5 credit points in the first year student subject pool.

There is also a follow-up study, which will be held approximately two weeks after this study. The follow-up study entails re-testing four of the questionnaires used in the first part of the study, and this will take approximately 25 minutes in total. The participants in this study are invited to this follow-up study, but participation is voluntary. If you choose to participate in the follow-up study, the questionnaires will be sent to you via email and, after you complete them, you will send them back to the researcher via email or by placing them in a sealed box on level 4 of the psychology building. All of the electronic files will be password protected with your student number. If you participate in the follow-up study, you will be awarded with an additional half course credit point *and* enter a draw to win two of six Gold Class movie tickets.

Possible Risks:

As this study is in part concerned with distressing events for the individual (i.e., previous trauma and history of depression), it is possible that your participation in this study could cause some emotional distress with memories of past events. It is important participants understand that participation in the study is voluntary, and you are free to withdraw at any time. In addition, possible referral agencies are cited at the end of this information sheet.

Possible Benefits:

Students who participate in this experiment will receive 1.5 credit points for their involvement. In addition, those who participate in the follow-up study will receive an additional half course credit point and enter a draw to win a pair of Gold-Class Movie tickets (six will be available in all; please see Appendix A). The findings are expected to provide information about different influences on memory recall and sense of self and will have benefit to the academic community. However, there may be no personal benefits from taking part in this study.

Voluntary and Confidential Participation:

Although the identifiable information is collected for re-testing and administration purposes, such information will be stored separately from your responses once the study has finished. At this point your responses will only have a participant number recorded on it. Thus, your participation in this study is confidential once you have completed

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what you agree to complete. All information gathered will be stored in locked filing cabinets at Griffith University (Mt Gravatt Campus), and will be accessed only by the researchers.

Your participation in this study is voluntary. If you agree to participate, but change your mind, you are free to withdraw from the study at any time without explanation. Withdrawing consent to participate in this research will not result in any penalty to you.

The anonymity of the data means that once you hand-in your last questionnaire (i.e., the second one if you agree to be part of the follow-up study, the first questionnaire if you do not wish to participate in the follow-up study) it cannot be retrieved, as we will have no way of identifying accurately which was yours.

The Privacy Statement:

The conduct of this research involves the collection, access and / or use of your identified personal information. The information collected is confidential and will not be disclosed to third parties without your consent, except to meet government, legal or other regulatory authority requirements. A de-identified copy of this data may be used for other research purposes. However, your anonymity will at all times be safeguarded. For further information consult the University's Privacy Plan at <http://www.griffith.edu.au/about-griffith/plans-publications/griffith-university-privacy-plan> or telephone (07) 3735 5585.

Questions and further information:

If you have any questions concerning this study or would like further information on the research please feel free to contact Associate Professor Grant Devilly at g.devilly@griffith.edu.au or on telephone number 3735 3309.

Email addresses will be gathered from those participants who wish to receive feedback on the study and/or who wish to participate in the follow-up study. Email addresses will be kept separate from each participant's responses following completion to ensure anonymity.

The Ethical Conduct of this Research:

Griffith University conducts research in accordance with the National Statement on Ethical Conduct in Human Research. If participants have any concerns or complaints about the ethical conduct of the research project they should contact the Manager, Research Ethics on 3735 5585 or email at research-ethics@griffith.edu.au

Contact Numbers for Assistance:

If you feel you require any assistance after this study please feel free to contact any of the listed researchers. Additionally, below are a number of services you can contact.

Student Counselling Services

- Mt Gravatt - (07) 3735 5669
- Nathan - (07) 3735 7470
- Gold Coast - (07) 5552 8734

Lifeline: 13 11 14

Beyondblue: 1300 22 4636

Australian Psychological Society (for referral): 1800 333 497

Thank you for your help with this research.

Terms and Conditions of Entry of the Draw Process

1. When you enter the competition, you accept these terms and conditions of entry.
2. Employees of Griffith University ("the University") and their immediate families are ineligible to enter.
3. Entry into the competition is by giving a completed consent form to the investigator (i.e., Miyuki Ono) to complete the follow-up study.
4. Three of the participants who completed the follow-up study (25 ~ 50 participants) will receive a pair of Gold-Class movie tickets.
5. The decision of the University is final and no correspondence will be entered into.
6. The prize is not transferable and cannot be redeemed for cash. The prize is not refundable.
7. The winner releases the University from any and all causes of action, losses, liability, damage, expense (including legal expenses) cost or charge suffered, sustained or in any way incurred by the winner as a result of any loss or damage to any physical property of the winner, or any injury to or death of any person arising out of, or related to or in any way connected with the University or the prize.
8. Any winner drawn for the prize who is unable to fulfil all of these terms and conditions will forfeit the prize and another winner will be drawn.
9. The winner will be notified by e-mail by no later than the end of November 2012.
10. The competition opens to entries at 9am on Monday the 12th March 2012 and the competition closes at the end of October 2012. The competition is drawn at Griffith University Mt Gravatt Campus on Friday the 16th November 2012 by an independent party. You do not have to be present at the draw to win.
11. The prize will be available for collection by the winner at the Griffith University Mt. Gravatt Campus M24_2.07 immediately after the draw (the winners will be notified by email).



School of Applied Psychology
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Mt Gravatt Campus, Griffith University
Brisbane, Queensland 4111, Australia

Consent Form

Investigation of factors related to autobiographical memory recall

By signing this form, I confirm that I have read (or had read to me) and understand the Participant Information Sheet. I understand that participating in this study will include

- completing a series of questionnaires that will ask me to list personality traits that apply to me, ask me to comment on my self-perception, ask about my feelings of stress, ask about any distressing experiences I have faced (ie. trauma, and history of depression); and ask about my ways of coping
• participating in two cognitive tests (i.e., one involves recounting scenarios from your past, the other involves hitting coloured buttons depending upon the colour of words show to you)

I understand that my participation in this study is voluntary and that I can withdraw without explanation or penalty at any time;

I also understand that personally identifying information gathered will be kept confidential;

I understand the potential risks of this study;

I understand that I can contact The Manager, Research Ethics, at Griffith University Human Research Ethics Committee on 3735 5585 (or research-ethics@griffith.edu.au) if I have any concerns about the ethical conduct of the project; and

I agree to participate in this study.

Participant's Signature Date

Investigator's Signature Date

Optional Consent:

It is also possible to re-complete questionnaires two weeks after this experiment and to also receive the results of this research via email. Please tick the box / boxes below if you are interested in participating in either or both of these options.

- ☐ I am interested in participating in the follow-up study and thus I agree to be contacted after this study, via email , in 2 weeks
☐ I am interested in receiving a summary of the results of this research when it is complete (approximately December 2012).

Name:

Email address: