DOES CONTROL MEDIATE THE RELATIONSHIP BETWEEN SELF-COMPLEXITY AND POSTTRAUMATIC PSYCHOLOGICAL ADJUSTMENT?

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Abstract

Posttraumatic stress disorder (PTSD) may develop following exposure to actual or threatened traumatic experiences. Research has shown that experiencing a trauma may alter, disrupt or distort ones identity. This thesis focused on the relationship between self-complexity (SC; Linville, 1985, 1987) and posttraumatic psychological adjustment. SC is defined as the number of non-overlapping self-aspects (i.e., traits, roles and behaviours) that one uses to describe themselves. Greater SC (i.e., where the self-aspects are many and differentiated) has been associated with better coping in response to adversity. The SC theory had only been tested once in relation to trauma (Morgan & Janoff-Bulman, 1994). The evidence-base has revealed mixed support for the SC theory; potentially due to methodological differences across studies. Furthermore, research found that greater SC may only be beneficial when people perceive the different parts of themselves to be under their control (McConnell et al., 2005).

Using a single group, cross-sectional, quantitative design, the research question 'does control mediate the relationship between self-complexity and posttraumatic psychological adjustment?' was investigated. Efforts were made to overcome the methodological limitations identified by previous research. One-hundred and ninety-four adult trauma survivors from the general public were recruited. The study was administered online and involved the completion of a SC task, three measures of posttraumatic psychological adjustment, a depression measure and brief demographic questions.

A significant positive correlation was found between negative SC and poorer posttraumatic psychological adjustment. A significant negative relationship was

found between positive SC and depression scores. The relationship between PTSD symptomatology and SC (of both valences) was significantly mediated by control.

In the discussion the theoretical implications of the research findings for both the SC theory and the PTSD models are explored. Also the clinical implications, including the potential utility of the SC measure in assessment and treatment of PTSD are considered.

Table of Contents

List of Appendices

List of Tables and Figures

Tables

Figures

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1-Introduction

1.1 Overview of Introduction

Posttraumatic stress disorder (PTSD) is a significantly disabling condition, which may develop following exposure to actual or threatened traumatic experiences. It is characterised by symptoms of intrusions, avoidance, negative alterations in cognition and mood, as well as changes in arousal and reactivity (American Psychiatric Association [APA], 2013). Trauma can become central to a person's identity due to the challenges involved with processing such experiences (Berntsen & Rubin, 2007). This can lead to discrepanies in how people schematically construct their views of themselves and the world (Janoff-Bulman, 1992). Individuals may develop a sense that there has been a permanent and negative change in themselves (e.g., Dunmore, Clark, & Ehlers, 1999). They may also feel as if their sense of self has been fragmented by the trauma (e.g., Dunmore, Clark, & Ehlers, 1999; Ehlers, Maercker, & Boos, 2000). Consequently, these changes alongside the unique nature of the trauma memory and the negative apraisals associated with it, act to maintain a sense of current threat to self (Ehlers & Clark, 2000). Once this threat is activated it is accompanied by intrusions and other re-experiencing symptoms (Ehlers & Clark, 2000).

Trauma research has begun to appropriate concepts regarding the self from social psychology (e.g., Morgan & Janoff-Bulman, 1994; Webb & Jobson, 2011), to better understand the role of the self in the development and maintenance of PTSD. A particular theory which may aid in this understanding is that of self-complexity (SC) (Linville, 1985, 1987). SC is comprised two components: the number of self-aspects (e.g., vegetarian, friend, optimist, teacher) that one uses to cognitively organise knowledge about the self and the degree of relatedness amongst the traits

used in describing these individual aspects (Linville, 1985, 1987). Linville (1985, 1987) argued that individual differences in vulnerability to stress, are partly due to differences in the complexity of ones cognitive self-representation. Individuals with greater SC (i.e., self-aspects are many and differentiated) are able to limit the impact of the stressor to a specific cognitive domain. Whereas, those with lower SC (i.e., fewer self-aspects with a greater degree of overlap) are more globally affected (Linville, 1985). Linville (1987) refers to this as the *SC buffering hypothesis*.

The *buffering hypothesis* (Linville, 1987) has attracted researchers to explore its efficacy for specific mental health conditions, such as depression (e.g., Kawahito, Hori, & Otsuka, 2010; Linville, 1985, 1987; Woolfolk, et al., 1999), anxiety (e.g., Stopa, Brown, Luke, & Hirsch, 2010), psychosis (e.g., Bell & Wittkowski, 2009) and personality disorders (e.g., Parker, Boldero, & Bell, 2006). However, at present there is only one study that has investigated the relationship between SC and the psychological consequences of trauma. Morgan and Janoff-Bulman (1994) researched SC and its implications for long-term adjustment following traumatic life events. They differentiated between positive and negative SC (i.e., a SC score comprising only the positive or negative traits selected to define the self), and found that psychological adjustment for those who had experienced a traumatic event was best predicted by greater positive SC. These findings were promising, however this study had a number of methodological shortcomings, thus required further research to validate its results.

McConnell et al. (2005) investigated the role of perceived control (i.e., ones ability to exercise authority over elements of themselves) in moderating the relationship between SC and subsequent outcomes. They found that SC was only protective if people felt that their various self-aspects were under their control. When

people did not feel that their self-aspects were under their control, then increased SC was associated with increased depression scores. Thus, the consideration of control was fundamental in the context of the stress-buffering effects of SC. The study of control is vital in relation to trauma, as PTSD usually results from events which are out of one's perceived control. Moreover, low levels of perceived control have been found to be associated with PTSD (Ehlers et al., 1998). Thus, incorporating perceived control into studies exploring the relationship between SC and trauma may be beneficial (McConnell et al., 2005). In light of this, this thesis aimed to identify whether perceived control over the different aspects of the self mediates the relationship between SC and posttraumatic psychological adjustment.

This introductory chapter contextualises the study of PTSD by providing a description of its diagnostic and clinical characteristics (section 1.2). Then the literature pertaining to PTSD and the self is explored (section 1.3). Next, contemporary psychological models of PTSD are outlined (section 1.4); the empirical evidence for the influence of trauma on self is discussed (section 1.5) and the National Institute for Health and Care Excellence (NICE) approved PTSD treatment options are considered (section 1.6). The SC theory (section 1.7 & 1.8) and the importance of perceived control (section 1.9) are presented. Finally, a description of the rationale and research questions for this thesis is provided (section 1.10).

1.2 Posttraumatic Stress Disorder (PTSD)

1.2.1 PTSD definition, diagnosis and changes with the introduction of DSM-V.

For clinical purposes, the psychopathology of trauma is conceptualised in terms of PTSD. PTSD is a severe and debilitating condition which impacts on social relationships, health, employment and quality of life (Richman & Frueh, 1996). The

Diagnostic and Statistical Manual of Mental Disorders (DSM) is the standard classification of mental disorders used widely by clinicians and researchers. It contains information about the symptoms and characteristic of different mental disorders. According to its fourth edition (DSM-IV; APA, 1999), a diagnosis of PTSD is given when an individual meets diagnostic criteria A to F. To meet criterion A the individual must have experienced, witnessed or been confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of others. Events considered as traumas include combat, torture, accidents, assault, rape, life threatening illness and natural disasters. Individuals must then experience a collection of persistent symptoms. These include re-experiencing of the trauma (Criterion B), avoidance and numbing (Criterion C), and increased arousal (Criterion D). Re-experiencing symptoms include persistent, repeated and unwanted flashbacks, dreams and/or nightmares, re-living symptoms and emotional and physical reactions when reminded of the trauma. Individuals may avoid stimuli associated with the trauma, such as conversations, thoughts and places. Furthermore, they may find that they are unable to remember important aspects of the trauma, lack interest in activities, feel distant from others or emotionally numb, and have a sense of a foreshortened future. Increased arousal symptoms include trouble concentrating, difficulty sleeping, irritability, outbursts of anger, exaggerated startle response and hypervigilance. To obtain a diagnosis of PTSD, all of the above symptoms must be present for longer than one month (Criterion E). Also, the disturbance must cause clinically significant distress or impairment in social, occupational, or other important areas of functioning (Criterion F).

In the DSM-V (APA, 2013) important changes were made to the diagnostic classification of PTSD to reflect advances in the evidence base. Markedly, PTSD

was reclassified from an “anxiety disorder” into a "trauma and stressor-related disorder" due to the acknowledgement that PTSD incorporates several negative mood states (e.g., anger, guilt and shame), not just anxiety (Friedman, Resick, Bryant, & Brewin, 2011). This is important because emotions such as shame negatively implicate the role of the self, not just ones behavior in relation to trauma (Tangney, 1991). The stressor criterion (Criterion A) has become more explicit in regards to how an individual experiences the “traumatic” event. Criterion A2 (subjective reaction; involving “fear, helplessness, or horror”) has been eliminated. A greater emphasis has been paid to the behavioural symptoms that accompany PTSD. Namely the avoidance/numbing cluster has been divided into avoidance and persistent negative alterations in cognition, and mood. The new cluster of persistent negative alterations in cognitions and mood has been characterised by symptoms including persistent, frequently distorted, negative beliefs and expectations about oneself or the world, persistent distorted blame of self or others for causing the traumatic event or for resulting consequences and feelings of alienation from others (e.g., detachment or estrangement). The extension of the clusters recognises the importance of cognitions for PTSD, and alludes to the significance of control. Importantly, it also acknowledges the emergence of a new focus of research into the impact of trauma on one’s sense of self (APA, 2013).

1.2.2 Prevalence rates, universality and risk factors.

Trauma can happen to anyone, and lifetime exposure to traumatic events ranges from 60-80% (e.g., de Vries & Olff, 2009; Norris, 1992; Stein, Walker, Hazen, & Forde, 1997). Research has proposed a dose-response relationship between trauma exposure and the onset of PTSD (Friedman, Keane, & Resick, 2007), whereby greater trauma exposure is more likely to lead to PTSD (Yule, 1999). For

example, in nations of war or countries subject to conflict (e.g., Algeria, Cambodia, and Palestine) trauma exposure can be as high as 90% (De Jong, Komproe, & Van Ommeren, 2003). In such populations greater PTSD prevalence is reported. Furthermore, some groups such as refugees, emergency workers, police (NICE, 2005) and military veterans (e.g., Schlenger et al., 1992) also report higher rates of PTSD due to their greater trauma exposure.

Whilst a majority of survivors display symptoms of PTSD in the initial aftermath, for many, their symptoms disappear naturally within six months (Foa & Riggs, 1995). For approximately 25% of trauma survivors, symptoms persist and they go on to develop PTSD (Ehlers & Clark, 2000; Green, 1994). The onset of symptoms is usually in the first month after the traumatic event. However in a minority of cases (<15%; McNally, 2003) there may be a delay of months or years before symptoms appear. For as many as 74% of trauma survivors their symptoms will persist for more than six months (Breslau, 2001). Furthermore, over a third of people with PTSD still experience symptoms several times a week after ten years (Kessler et al., 1995).

A number of factors contribute to PTSD prevalence; one of the most researched is trauma type. Different types of traumatic events are associated with different PTSD rates (Carr & McNutly, 2006). Intentional acts of interpersonal violence, in particular sexual assault, combat and torture are consistently associated with the highest rates of PTSD (e.g., Carr & McNulty, 2006; Creamer, Burgess, & McFarlane, 2001; Kessler et al., 1995; Stein et al., 1997). Studies have found that 65% of men and 46% of the women who experienced rape met PTSD criteria (Kessler et al., 1995). Other traumatic events associated with high PTSD rates included physical abuse/attack, and being threatened with a weapon, kidnapped or

held hostage. Conversely, accidents, witnessing death or injury, and fire or natural disasters were associated with lower lifetime PTSD rates (Kessler et al., 1995).

PTSD has been documented throughout the world, in various societies and cultures, so is considered a universal trauma response (Figueira et al., 2007; Foa, Keane, Friedman, & Cohen, 2009). For example, North et al. (2005) compared Kenyan survivors of the bombing of the American embassy in Nairobi with American survivors of the bombing of the Federal Building in Oklahoma City, as these events had similar consequences (i.e., death and injury). They found comparable PTSD prevalence among Africans and Americans exposed to these different traumatic events. Furthermore, the DSM-IV (APA, 1994) PTSD diagnostic criterion has been validated cross-culturally, and acknowledges that the precise PTSD expression may be culturally specific (Hinton & Lewis-Fernandez, 2010).

PTSD risk factors are typically grouped into pre-traumatic, peri-traumatic and post-traumatic factors. Pre-traumatic factors put people at higher risk of developing PTSD when exposed to a trauma (Koenen, 2007). They include female gender, low socioeconomic status, younger age at the time of trauma exposure, lower intelligence and family psychiatric history (e.g., Brewin, Andrews, & Valentine, 2000; King, King, Foy, Keane, & Fairbank, 1999; Vogt, deHouwer, Koster, vanDamme, & Crombez, 2007). However, these influences have only been found to have a small to moderate effect size (Brewin, Andrews, & Valentine, 2000) when predicting PTSD onset following trauma exposure. Peri-traumatic risk factors concern the nature of the traumatic experience itself as well as one's reaction to it. For example, dissociative responses during the trauma have been found in numerous studies to be a significant risk factor for subsequent PTSD (Allen, 2001). Posttraumatic risk factors include poor social support and ongoing stress after the

trauma put people at greater risk of developing PTSD (Brewin, Andrews, & Valentine, 2000; Vogt et al., 2007).

1.2.3 PTSD co-morbidity, impact on functioning and costs.

Those with PTSD are more than twice as likely to suffer from physical health problems, as compared to a matched sample of trauma survivors without PTSD (Kimerling, 2004). These include cardiovascular diseases, respiratory diseases, chronic pain conditions, gastrointestinal illnesses, neurological symptoms and cancer (McFarlane, Atchison, Rafalowicz, & Papay, 1994; Sareen, Cox, Stein, Afifi, Fleet, & Asmundson, 2007). PTSD has also been associated with a unique dysregulation of the immune system (Altemus, Dhabhar, & Yang, 2006). In veterans, PTSD severity has been found to predict health problems 18-24 months after a trauma (Wagner, Wolfe, Rotnitsky, Proctor, & Erickson, 2000). Also, somatic symptoms are frequently reported by trauma survivors, including aches and pains, psychosexual difficulties, gastrointestinal disruptions and poor health behaviour (Carr & McNulty, 2006).

Around 80-85% of people diagnosed with PTSD also meet criteria for another psychiatric disorder (e.g., Brown, Campbell, Lehman, Grisham, & Mancill, 2001; Creamer et al., 2001; Kessler et al., 1995; Solomon & Davidson, 1997). PTSD typically predates the comorbid condition (Kessler et al., 1995). This has been found consistently across populations (i.e., males, females, veterans, sexual assault victims and the general population), stressors (i.e., military combat, rape, physical assault, childhood sexual abuse and violence), and diagnostic measures (i.e., structured clinical interviews and self-report measures) (Kessler et al., 1995). In the National Comorbidity Study, Kessler et al. (1995) found that, among males, rates of comorbidity with PTSD were approximately 88%. For men PTSD was found to be

co-morbid with alcoholism (53%), depression (48%), conduct disorder (43%), drug use (35%) and phobias (31%). In contrast, for female subjects Kessler et al. found that rates of comorbidity were 79%. Spanning co-morbidity with depression (49%), alcoholism (30%), drug use (27%), phobia (29%) and conduct disorder (15%). Similarly, comorbidity has been found between PTSD and generalised anxiety disorder, mania, dysthymia, panic (Kessler et al., 1995) and obsessive compulsive disorder (Brown, Campbell, Lehman, Grisham, & Mancill, 2001).

Comorbidity rates between PTSD and depression are particularly high. Shalev et al. (1998) investigated PTSD symptoms and major depression in 211 trauma survivors from a hospital accident emergency service. One month after the traumatic event, 30% of survivors met criteria for PTSD and 19% met criteria for major depression. Of those who developed PTSD, 44.5% had comorbid depression at one month, and 43.2% at four months. The comorbidity of PTSD and depression was associated with increased symptom severity and decreased functioning (Shalev et al., 1998). Additionally, an extensive epidemiological study by Breslau (2001) suggested a shared vulnerability to PTSD and depression in trauma victims, with the trauma experience serving as a psychological trigger for both disorders (Bleich, Koslowsky, Dolev, & Lerer, 1997). Given that PTSD is typically the primary diagnosis when the two co-occur. Kessler et al. (1995) speculated that PTSD instigates depression. Furthermore, many researchers have pointed out there is a high degree of overlap between PTSD symptomatology and major depression (e.g., diminished interest, restricted range of affect, sleep difficulties, difficulty concentrating; Keane & Wolfe, 1990), which may contribute to the comorbidity observed (Kessler, 1995).

Research has illustrated a significant association between attempted suicide and traumatic events, such as childhood abuse (e.g., Dube, Anda, Felitta, Chapman, Williamson, & Giles, 2001), combat (e.g., Adams, Barton, Mitchell, Moore, & Einagel, 1998; Farberow, Kang, & Bullman, 1990; Freeman, Keesee, Thornton, Gilette, & Young, 1995), and previous sexual assault or rape (e.g., Davidson, Hughes, George, & Blazer, 1991). In an epidemiological study, Davidson, Hughes, George, and Blazer (1991) found that 19.8% of the PTSD sample had attempted suicide compared to 3.9% of the sample with other psychological disorders and 0.8% of the non-psychiatric case group.

There is an extensive evidence base highlighting the comorbidity between trauma and substance misuse (e.g., Kessler et al., 1997; McFarlane, 1998; Volpicelli, Balaraman, Hahn, Wallace, & Bux, 1999). It is possible that PTSD sufferers use alcohol, drugs, caffeine or nicotine to cope with their symptoms, which may eventually lead to dependence (NICE, 2005). In a cross-sectional study of a community sample, McFarlane (1998) found that traumatic events were associated with at-risk drinking. Additionally, in a longitudinal study of firefighters exposed to a natural disaster, McFarlane (1998) found that not only was PTSD associated with increased alcohol consumption but that alcohol use increased PTSD prevalence.

PTSD is often associated with poor social functioning, whereby sufferers may isolate themselves, feel detached and experience more interpersonal conflicts (Hearst, Newman, & Hulley, 1986; Kulka et al., 1990; Resick, Calhoun, Atkeson, & Ellis, 1981). Consequently people with PTSD commonly report relationship and employment difficulties. Riggs, Byrne, Weathers, and Litz (1998) found that more than 70% of Vietnam veterans with PTSD and their partners reported clinically significant relationship distress compared to 30% of the non-PTSD couples. Byrne

and Riggs (1996) found that Vietnam veterans with higher levels of PTSD were more likely to use aggression in relationships. NICE (2005), found that symptoms such as re-experiencing, troubled sleep and impaired concentration make regular work difficult, resulting in increased job loss amongst PTSD sufferers. The resulting financial problems are a common source of additional stress (NICE, 2005). PTSD is associated with increased workplace costs, partly due to loss of productivity (Greenberg et al., 1999). According to the World Health Organization's Global Burden of Disease (2004), PTSD costs 3.5 million healthy life years worldwide.

1.2.4 Summary.

PTSD is a severe, universal, debilitating condition, in which sufferers experience a range of distressing symptomatology. It is associated with significant physical, emotional, personal, social, occupational and financial problems (Lauterbach, Vora, & Rakow, 2005). It is often co-morbid with other mental health diagnoses, most commonly depression. Consequently, it is imperative to understand this disorder and its effects, in order to prevent and treat its occurrence. Newer diagnostic models of PTSD (DSM-V) are starting to acknowledge the fundamental roles of the self, appraisals and control in PTSD. However, future research is required to better understand how these different aspects relate to PTSD.

1.3 PTSD and the Self

1.3.1 Definitions of the self.

The 'self' is the largest structure in the cognitive system. It encompasses all personality relevant information derived throughout one's life (e.g., Greenwald & Pratkanis, 1984; Nowak, Vallacher, Tesser, & Borkowski, 2000). The study of self is vital for understanding behaviour, motivation, identity, affect and cognition

(Sedikides & Spencer, 2007). Initially, the self was seen as a unitary construct (e.g., Allport, 1955; Kihlstrom & Klein, 1994; Rogers, 1951, 1977), but contemporaries have argued that it is better understood as multifaceted, containing various roles, aspects and perspectives (e.g., Baumeister, 1999; Linville & Carlston, 1994). The self is constructed through experience, encoded in memory, and enacted in the physical and social world (Marsh & Shavelson, 1985). It is influenced by others perceptions (Shavelson, Hubner, & Stanton, 1976). It contains thoughts, feelings, experiences and relationships (Mead, 1934), which together form self-schemas, prototypes, goals and images (Sherman, Judd, & Bernadette, 1989).

The *self-concept* is a term used to refer to how someone thinks about, evaluates or perceives their self as a whole. Baumeister (1999) described self-concept as "the individual's belief about himself or herself, including the person's attributes and who and what the self is" (p. 13). *Self-schemas* are cognitive-affective structures, which encapsulate one's self-knowledge. They include memories that summarise an individual's beliefs and generalisations about the self in specific behavioural domains (Markus, 1977; Markus & Wurf, 1987). Markus (1977) argues that, to be self-schematic, an attribute should be both descriptive of, and important to, the self-concept. Self-schemas can be developed about any aspect of a person including physical characteristics, social roles, personality traits and areas of skill or interest (Markus & Sentis, 1982). Self-schemas may vary in content (e.g., information about one's qualities, roles and goals), structure (e.g., their integration, organization and clarity; Campbell, 1990; Campbell & Lavalle, 1993; Donahue, Robins, Roberts, & John, 1993) and coherence (i.e., the degree to which one perceives oneself as being consistent; Markus, 1977).

People are biased to direct their attention to schema consistent information, which they are able to process more quickly and have greater recall for (e.g., Bargh, 1982; Kuiper & Rogers, 1979; Rogers, Kuiper, & Kirker, 1977). Additionally, people have been found to act in accordance with their schemas (e.g., Jung & Lennon, 2003) and predict future behavior in a schema-congruent manner (Markus & Sentis, 1982).

The self is a dynamic force that interprets and organises information about oneself, responds to the social environment and motivates behaviour (e.g., Markus & Wurf, 1987). It underpins processes such as self-esteem (Tesser, 1988), self-deception (Gur & Sackheim, 1979), identity maintenance (Brewer & Kramer, 1985), self-consistency (Lecky, 1945), self-regulation (Carver & Scheier, 1981), self-discrepancy (Higgins, 1987), self-schemas (Markus, 1977), self-actualisation (Goldstein, 1939), self-efficacy (Bandura, 1977), self-concept (Combs, 1962), possible selves (Markus & Nurius, 1986) and, the focus of this thesis 'self-complexity' (Linville, 1985, 1987). These processes attest to a specific organisation system of the self-structure (Nowak, Vallacher, Tesser, & Borkowski, 2000).

1.3.2 Influence of trauma on self.

Trauma brings about profound, lasting, structural changes to one's sense of self (e.g., Brewin, 2003; Dalgleish & Power, 2004; Dunmore, Clark, & Ehlers, 2001; Ehlers et al., 2000; Herman, 1992; Joseph & Linley, 2006; van der Hart et al., 2006). For instance, research into childhood abuse has reported that survivors find it harder to recall autobiographical facts about their childhood (Hunter & Andrews, 2002) and sometimes forget the abuse for extensive periods of time. This might be due to an inability to incorporate these traumatic experiences into one's self-concept (Brewin, 2011; Schooler, 2001). Furthermore, research with former political prisoners, war

veterans, and perpetrators of violent crime have found PTSD to be associated with a lack of self-referent processing during the assault, more disorganised assault narratives, greater negative view of the self, perceived permanent change in self and self-blame (Evans, Ehlers, Mezey, & Clark, 2007). The more complex the trauma, the greater the impact it has on one's identity (Brewin, 2011).

Trauma can form a turning point in how PTSD sufferers construct their self-concept (e.g., Pillemer, 1998). When survivors with PTSD are asked to describe their memories that define their sense of self, they frequently choose trauma-related memories when compared to trauma survivors who do not develop PTSD (Jobson & O'Kearney, 2008; Sutherland & Bryant, 2005). Similarly, PTSD symptoms have been found to be higher in individuals for whom the trauma has become central to their identity and life story. In these individuals the trauma memory acts as a cognitive reference point from which all future memories are organised (Berntsen & Rubin, 2007). Negative changes in self-perception have similarly been shown to predict a greater risk of developing PTSD, even after initial symptoms are controlled for (Dunmore et al., 2001; Ehlers et al., 1998; Halligan, Fink, Marshall, & Vallar, 2003), as well as a poorer response to exposure in those receiving treatment for PTSD (Ehlers et al., 1998). These symptoms may result in distortions and alterations in one's self-concept, leading to negative and permanent change in self (e.g., Dunmore, Clark, & Ehlers, 1999; Ehlers, Maercker, & Boos, 2000).

Survivors commonly find it hard to integrate ideas about traumatic events with the assumptions they previously held about themselves (Horowitz, 1976; Janoff-Bulman, 1992). This leads them to experience negative emotions pertaining to the self (e.g., guilt, shame, worthlessness) which maintain PTSD symptoms by reinforcing the sense of ongoing threat (e.g., Ehlers & Clark, 2000; Ehlers, Mayou,

& Bryant, 1998). This is partly due to the cognitive changes which take part after a trauma. For instance, survivors often have erroneous cognitions about the causes and consequences of the traumatic event which leads them to wrongly attribute blame (i.e., self-blame). Altering these erroneous cognitions and reframing the blame is a key component of cognitive treatment (Ehlers, Clark, Dunmore, Jaycox, Meadows, & Foa, 1998; Feiring & Cleland, 2007; Resick, Nishith, Weaver, Astin, & Feuer, 2002). Other common erroneous appraisals include the belief that one is inadequate, weak, or permanently changed for the worse as well as alterations in appraisals about the self in relation to the world and other people. Furthermore, people with PTSD frequently have persistent negative expectations about themselves, others and their future (e.g., "I am a bad person", "nothing good can happen to me", "I can never trust again") (Ehlers & Clark, 2000).

There is an emerging body of literature from the field of positive psychology which suggests that for some, the experience of trauma can result in changes which are positive and valued (Tedeshi & Calhoun, 2004). This process has been labelled 'post-traumatic growth' and suggests that trauma-survivors may experience a greater appreciation of life, closer relationships, identification of new possibilities, increased personal strength, and positive spiritual change (King & Hicks, 2009). These changes might result in a renewed purpose, a redefined sense of self and a changed relationship with the world. Individuals may display higher levels of self-efficacy; their sense of self may be positively changed by the trauma in that they feel more able to overcome adversity (Sheikh, 2008).

1.3.3 Summary.

The study of self is vital for better understanding behaviour, motivation, identity, affect and cognition (Sedikides & Spencer, 2007). Theories have inferred

that as the self is central for other psychological structures (i.e., self-esteem, self-deception & self-complexity) it must possess an organizational structure of its own. Furthermore, the self has been shown to play a central role in psychopathologies such as PTSD. The PTSD literature has illustrated that trauma can result in profound, lasting, structural changes to one's sense of self (e.g., Brewin, 2003; Dalgleish & Power, 2004; Dunmore, Clark, & Ehlers, 2001). The trauma may become central to the self, resulting in a sense that the self has been permanently and meaningfully changed (e.g., Dunmore, Clark, & Ehlers, 1999; Ehlers, Maercker, & Boos, 2000). Further research into the precise structure of the self may allow clinicians to better address the important topic of the self in treatment.

1.4 Psychological models of PTSD

1.4.1 Overviews of models.

A substantial amount of research has been conducted into the mechanisms underpinning PTSD. These include memory (e.g., Sutherland & Bryant, 2007), attention (e.g., Jenkins, Langlais, Delis, & Cohen, 2001), appraisals (e.g., Agar, Kennedy, & King, 2006), cognitive affective reactions (e.g., Brewin & Holmes, 2003), meaning and belief systems (e.g., Park, Mills, & Edmondson, 2012), cognitive coping strategies (e.g., Biro, Novović, & Gavrilov, 1997), social support (e.g., Klarić et al., 2008) and the self (e.g., Berntsen & Rubin, 2007). Conceptual PTSD models have drawn on socio-cognitive (e.g., Horowitz, 1976; Janoff-Bulman, 1992), conditioning (e.g., Keane, Zimering, & Caddell, 1985), information processing (e.g., Foa, Steketee, & Rothbaum, 1989) and emotional processing theories (e.g., Brewin & Holmes, 2003; Foa & Riggs, 1993; Foa & Rothbaum, 1998). This section will describe and critique the theories which underpin our current understanding of PTSD. These include the dual representation theory (e.g., Brewin

& Holmes, 2003), cognitive appraisal model (Ehlers & Clarkes, 2000), the self-memory system (Conway, 2005), the schematic, propositional, analogue and associative representation (SPAARS) model (Dalgleish & Powers, 2004) and the mnemonic model (Berntsen & Rubin, 2006, 2007). In particular this section will examine how these prominent PTSD models conceptualise the role of the self in the development and maintenance of PTSD.

1.4.2 The dual representation theory.

Brewin's (Brewin, 1989, 2001, 2011; Brewin, Dalgleish, & Joseph, 1996; Brewin & Holmes, 2003) dual representation theory (DRT) explains the nature of the intrusive memories experienced during PTSD. It argues that trauma experiences are stored in two distinct but parallel memory systems, making them fundamentally different from other memories. These systems are the *verbally accessible memory* (VAM) system and *situationally accessible memory* (SAM) system. The VAM system supports abstract declarative representations which are integrated with other autobiographical memories, allowing them to be detailed in nature. Thus, they are available for deliberate retrieval, manipulation and verbal communication. The SAM system supports low-level representations, which lack verbal content so are represented in accordance to their sensory and affective qualities. Brewin (2011) suggests that events concerning the self are more likely to be remembered.

This model uniquely argues that the original trauma memory is not altered in any way but remains intact. It suggests that during a trauma, one is under extreme stress which narrows attention and causes less information about the event to be stored in VAM (Brewin, 2003). This reduction in encoding may lead to experiences of dissociation, mental defeat, or a loss of control (Ehlers, Maercker, & Boos, 2000). However, as the information is deemed imperative for survival it is stored in the

SAM system without the usual contextual links to the VAM system. Flashbacks and intrusive memories are experienced, as without the contextual links the memory is left susceptible to being involuntarily brought into consciousness when reminders of the trauma are encountered. As these memories reside in the SAM system, they are often fragmented, chronologically disorganised and involve sensory-perceptual components (Brewin, 2011). This makes them hard to edit or manipulate (Brewin & Holmes, 2003).

Brewin (2011) argues that flashbacks are an adaptive process in which stored information can be re-presented and processed in greater depth once the danger has past. However, due to their distressing nature they are often avoided, thus remain unprocessed and in need of integration (Brewin, 1989). The emotional processing of trauma memories must utlise both the SAM and VAM systems, in order for PTSD symptomatology to reduce. New SAMs can be created which consist of the original trauma image paired with reduced arousal through a process of exposure and/or cognitive restructuring. These new SAMs block access to the original trauma memories (Brewin, 1989; Brewin & Holmes, 2003), which decreases the associated PTSD symptomatology. Brewin, Dalgleish, and Joseph (1996) suggested, the greater the discrepancy between the trauma and prior assumptions, the more difficult the trauma memory is to process.

Furthermore for PTSD symptoms to dissipate, appropriate adjustments must be made to the negative trauma related beliefs about the self, world and future held in the VAM system (Brewin & Holmes, 2003). They suggest that identity is composed of multiple self-representations which compete to be retrieved (Brewin & Holmes, 2003). Negative trauma-related cognitions (i.e., “I am weak”, “I am powerless”, and “I am inferior”) often arise because the trauma has blocked the

retrieval of positive self-identities or has activated pre-existing negative self-identities (Brewin & Holmes, 2003). Thus, modifying negative cognitions may involve exploring the individual's construction of self and allowing the trauma to be incorporated within it (Brewin & Holmes, 2003). Clinicians are advised to enhance access to positive identities by making them more distinctive and creating new associative links between them. Enabling them to be retrieved following the activation of negative thoughts or images (Brewin & Holmes, 2003). Integrating new information into ones preexisting concepts and beliefs, can aid contextualization of the trauma memory held in the SAM system through a process of elaboration using the VAM system. Also it can help clients reassert perceived control and safety by reattributing responsibility of the traumatic event (Brewin & Holmes, 2003). This may reduce the discrepancy between pre and post trauma assumptions. These processes can be facilitated using cognitive techniques and therapeutic exposure (e.g., Resick & Schnicke, 1993).

DRT is a testable, empirically supported model (see Brewin, 2014) which provides direct advice to clinicians providing PTSD treatment. Whilst the proposal of VAMs and SAMs are unique, this model fails to explain how they fit into existing models of memory. Its account of how the meaning of trauma memories is transformed and how the trauma can be integrated into pre-existing representations lacks detail. It does not describe whether ordinary memories of traumatic events can exist alongside dissociated memories, or how one form of memory is transformed into another. This model touches on the topics of self and considers trauma-related cognitions, but fails to detail how structural models of the self might be represented in cognition (Yule, 1999). It successfully considers the importance of control in the development and treatment of PTSD.

1.4.3 The cognitive appraisal model.

Ehlers and Clark (2000) cognitive appraisal model was designed to explain the persistence of PTSD and to provide a framework for the cognitive behavioural treatment of its symptoms. This model functions as an extension of the SMS (see section 1.4.4) and builds on Brewin, Dalgleish, and Joseph (1996) proposition that trauma memories are poorly incorporated in autobiographical memory.

This model suggests that persistent PTSD occurs if individuals process the trauma event and/or its sequel in a way which creates a sense of current threat. Two key processes are proposed to lead to a sense of current threat. First, individual differences in the appraisal of the trauma and/or its sequelae, particularly appraisals regarding the self. Second, individual differences in the nature of the memory (i.e., disruptions and distortions in autobiographical memory) for the event and its link to other autobiographical memories. These processes make the trauma memory difficult to integrate into one's sense of self. As a result of these processes, people experience a sense of current threat, which can include either an external threat to safety or an internal threat to self and the future. This is accompanied by intrusions, re-experiencing symptoms, heightened arousal, anxiety and other emotional responses. The perceived threat motivates behaviours and cognitive responses that are intended to reduce perceived threat and distress in the short-term, but inversely prevent cognitive change and maintain the disorder.

According to this model PTSD sufferers differ from those who recover naturally as they fail to see the trauma as a time limited event, which does not have global negative implications for themselves or their future. They are characterised by idiosyncratic negative appraisal of the traumatic event which creates a sense of serious current threat to the self. This may lead sufferers to inflate their perception of

the chance that a trauma may happen again and interpret the traumatic events occurrence as holding personal significance. Additionally, survivors experience negative self-appraisals regarding the way they felt or behaved during the trauma, other people's reaction to their trauma, as well as the trauma impact. If individuals do not see their trauma symptoms as a normal part of recovery, they may interpret them as a threat to their current wellbeing or as an indication that they have been meaningfully and permanently changed for the worse. These negative self-appraisals about the trauma and its sequelae maintain PTSD by evoking negative emotions (e.g., anxiety, depression or anger) and encouraging individuals to engage in dysfunctional coping mechanisms, which paradoxically enhance the symptoms of PTSD.

Susceptibility to negative self-appraisals is connected with 'mental defeat', which refers to ones perceived inability to exert cognitive control over an event or one's future. Negative self-appraisals have been associated with both PTSD diagnosis and symptom severity, and reductions of these appraisals after treatment are associated with a fewer symptoms (Karl, Rabe, Zollner, Maercker, & Stopa, 2009). Ehlers et al. (1998) conducted a study to identify individual differences in response to exposure treatment, in a group of female sexual assault survivors. Those who received less benefit from exposure treatment were more likely to have experienced mental defeat, an absence of mental planning (attempts to exert control over the situation, even in minimal and symbolic) and feel that the self had been permanently negatively changed by the event. Ehlers et al. (1998) suggested that mental defeat may reflect the patient's perception that the situation is totally uncontrollable. Exposure may be particularly unhelpful if it reconfirms negative beliefs that the victim holds about themselves (e.g., 'I am weak', 'I am to blame',

and 'I am disgusting'). On the contrary those with better outcome were able to regain a sense of autonomy during the event.

This model integrates knowledge from associative network theories, as it suggests that the trauma memory has strong associations which make it easily accessible by a large number of triggers (e.g., Foa et al., 1989). The retrieval from associative memory is cue driven and unintentional, thus the individual may be unaware of the triggering associations. This results in a failure to identify the triggers of re-experiencing which prevents individuals learning they are not in themselves dangerous. Furthermore, the nature of this remembering in itself and the accompanying fragmentation of the memory may lead one to negatively appraise the self (i.e., "there is something wrong with me").

This model is supported by empirical evidence, informs treatment and attempts to explain individual differences in trauma response (Ehlers et al., 1998). It highlights the importance of appraisals and memory in leading to persistent PTSD. Of particular interest to this thesis, it illustrates the significance of negative self-appraisals which may result in a sense that the self has been meaningfully changed by the trauma. This model fails to detail how the self is represented in cognition and how interventions designed to target the self may be beneficial. It successfully illustrated the role of control in PTSD, suggesting that those who perceive they have no sense of control during the event (in mental defeat) are more likely to experience negative self-appraisals. Further research looking at the relationship between PTSD and self, should be sure to consider the role of appraisals and control.

1.4.4 The self-memory system.

The self-memory system (SMS; Conway, 2005; Conway, Meares, & Standart, 2004; Conway & Pleydell-Pearce, 2000) is a theoretical model which

elucidates the role of self in remembering. It is comprised two parts: *working self* and *autobiographical memory knowledge base,* which together form a self-system. This model conceptualises the self as a complex set of goals and control processes (Baddeley, 1986), collectively referred to as the working self. The goals of the working self are organised into hierarchies that constrain cognition and behaviour, and aid in the encoding and retrieval of autobiographical knowledge (Conway & Pleydell-Pearce, 2000). The autobiographical memory knowledge base contains information at three different levels of specificity: lifetime periods (e.g., "when I was at university"), general events (e.g., "playing chess") and event-specific knowledge (e.g., specific details of an incident, including images and emotions). The relationship between the working self and autobiographical knowledge is a reciprocal one. Autobiographical knowledge is encoded through the goal structure of the working self, which aids the construction of memories at each level of specificity during remembering. Thus, grounding the self by ensuring the goals held are congruent to one's self-image and goals, reducing inconsistencies between desired goals and the present state. The working self determines what autobiographical knowledge can be accessed, how it is encoded and its representation in memory (Conway & Pleydell-Pearce, 2000).

In 2004 (Conway, Meares, & Standart), the SMS was extended to include the *conceptual self,* further signifying the importance of the self in memory. The conceptual self consists of information about the self, contextualised in autobiographical knowledge and grounded in specific episodic memories. The resultant self-knowledge helps to define the self, others and interactions with the world. They include personal scripts (e.g., Demorest, 1995; Singer & Salovey, 1993; Thorne, 1995), possible selves (Markus & Nurius, 1986), relational schemas

(Baldwin, 1992), self-guides (Strauman & Higgins, 1987), as well as attitudes, values and beliefs (Conway, 2005). The conceptual self is derived from and closely associated to the goal structure, thus it has a bias to recall things in a goal congruent manner. Additionally, it helps to control and regulate autobiographical remembering by activating memories and grounding them in their underlying context. Thus, the conceptual self and the working self, control, and regulate autobiographical remembering.

The SMS proposes that PTSD memories fall outside the range of the working self. Thus it cannot be integrated in long-term autobiographical knowledge as doing so would threaten the entire goal system (Conway & Pleydell-Pearce, 2000). Instead, the trauma memory's encoding is strongly associated with the goals of the working self active during the trauma. Consequently, the trauma becomes intertwined with one's knowledge about the self and the self becomes fundamentally changed as a result of trauma. This model argues that trauma by nature contains a threat to the self-system, in the form of a near death experience or severe physical injury accompanied by negative cognition and affect. This creates a threat to one's current plans and goals, in a way that the working self is unable to adapt. Without the autobiographical context, survivors are unable to differentiate between the trauma being remembered and it being lived, resulting in re-experiencing symptoms (Conway, Meares, & Standart, 2004). This makes it hard for survivors to intentionally recall the trauma and leaves the memory vulnerable to being triggered by cues encountered in the environment whenever the associated goal is activated, resulting in intrusive flashbacks and vivid reliving (Ehlers & Clark, 2000). For these memories to become integrated with the knowledge base, and the aversive symptoms to reduce, the goal structure of the working self must change (Conway et al., 2004).

Conway et al. (2004) suggests that goal change is difficult as it carries a high cognitive and emotional cost as well as large consequences for many other goals. It's possible that this goal change which leads survivors of trauma to feel as if their self has been changed by the trauma. Also, the trauma memory must be contextualised into the autobiographical knowledge base as this will enhance the individual's control of the memory (Conway & Pleydell-Pearce, 2000).

The SMS suggests two routes through which memories can be retrieved from the autobiographical knowledge base: *generative retrieval* and *direct retrieval*. Generative retrieval refers to a slower three stage process (i.e., elaboration of search cue, initiation of search strategy, and evaluation of search results) of memory retrieval, which continues until a predetermined verification criterion is met. In direct retrieval memories are retrieved by matching specific cues or stimulus associated with the event and details of episodic memory. As normal events are integrated into the autobiographical knowledge base, they contain contextual links to other general events and lifetime periods. As these memories are elaborated, they lend themselves to generative retrieval and inhibit direct retrieval. However, as trauma memories lack autobiographical context, direct retrieval is utilised. This makes the trauma memory more easily accessible and more frequently activated. However, this element of the model has yet to gain widespread support as it struggles to explain things such as confabulation and other types of false memory.

Coherence and *correspondence* are also important aspects of the SMS. Coherence refers to the drive for memory to be congruent to ones knowledge about the self (Conway, et al., 2004), in order to maintain current goals. (Greenwald, 1980). Correspondence refers to the demand for memory to correspond to experience (Conway et al., 2004). In line with coherence, the working self aspires to reduce

memories which challenge or threaten the self-system. This may be done by distorting threatening memories and prioritizing those that meet the current goals. Hence, individuals tend to retain memories that correspond with the goals of their working self and alter information which requires goal change (Conway, 2005). Thus, after a trauma, coherence may be achieved through memory distortions (alteration, distortion, fabrication) which attempt to protect the self from the perception of the need for change (e.g., Conway, 2005). Unfortunately, in such circumstances the conflicting needs of coherence and correspondence may become too cognitively demanding, necessitating transformations to the existing self-schema in order to restore balance (Conway, 2005). Thus, posing a potential dilemma for research attempting to better understand the relationship between trauma experiences and how the self is cognitively constructed.

This model provides a theoretical basis to conceptualise the role of the self in memory, specifically trauma memories. However, the precise organization of the self and its goals, individual differences in the construction of self and the nature of the changes to the self because of trauma, all require further elaboration. This model fails to consider the fundamental role of appraisals in PTSD, and only briefly mentions the role of control. Furthermore, it is a cognitive model of memory rather than a PTSD specific model. Nonetheless, it raises an interesting point about the integrity of accessible self representations after a trauma, considering the memory distortions which take place to protect the self.

1.4.5 The schematic, propositional, analogue and associative representation model.

The SPAARS model (Dalgleish, 1999, 2004; Dalgleish & Powers, 2004) has four levels of representation: *analogical*, *propositional*, *schematic* and *associative*.

The analogical representational system stores memories in multiple modalities (i.e., visual, olfactory, auditory, gustatory, body state, proprioceptive "images") (Rubin & Greenberg, 1998). It also codes referential nonverbal information to complement the propositional system. The propositional representational system is similar to VAM in the DRT (Brewin & Holmes, 2003), as it represents meaning in "verbal" form. The schematic representational system is similar to schemas and represents abstract, generic knowledge. Finally, the associative representational system represents the connectivity between the other three networks. These different systems represent working memory spaces where information can be manipulated. The system is hierarchical, with the propositional and analogical levels processing basic manipulations of thought or mental images. The schematic level sits above the propositional and analogical levels and integrates the information in a schematically congruent manner.

The SPAARS model suggests two emotional generation routes. The first is an appraisal driven route, whereby events and event interpretations are appraised at the schematic level in line with the individual's goals. The second route is an automatic route, where emotions are generated automatically in accordance to the individuals past emotional responses. According to this model, the trauma memory is regarded as qualitatively different to non-trauma memories (as in DRT; Brewin, Dalgleish, & Joseph, 1996), as there is a discrepancy between the trauma memory and one's pre-trauma schemas. When a trauma takes place, information about the trauma is encoded in parallel as propositional, analogical and schematic representations. This distributes the information about the memory across different systems. When the trauma related information is appraised by the schematic representational system it is deemed incompatible and signals threat to the self. This

incompatibility threatens the person's sense of self so is poorly integrated into ones existing self-representations, leading to PTSD symptomatology.

The role of the self schema within SPAARS is to organise and provide meaning for the other information in memory, by allocating resources to processing incompatible information in an attempt to assimilate it. Thus, emphasizing how fundamental ones perception of the self is for processing memories. Following a trauma the system struggles with the unprocessed threatening incompatible information, thus the schematic level continually appraises the information resulting in constant activation of the fear module. Consequently, the survivor feels in a constant state of danger and experiences PTSD symptomatology such as flashbacks, vivid images, intrusive thoughts and nightmares. Additionally, cognitive processing biases are experienced which prevent the trauma being successfully integrated into one's sense of self. This model proposes five types of pre-trauma personality and outlines their implications for the course of PTSD within the SPAARS. The model suggests that PTSD is caused by a breakdown of the self-schema rather than from the trauma experience alone.

This model successfully highlights the importance of the self in memory and trauma. It integrates knowledge about schemas and explains the impact of the trauma on the schematic representational system. It also uses knowledge about appraisals, to explain how the trauma impacts on the self. However, the specific schematic representation of the self is not detailed and the role of control is omitted.

1.4.6 The mnemonic model.

The "mnemonic model" (Berntsen & Rubin, 2006) refutes the notion that trauma memories are qualitatively different to other autobiographical memories (as suggested by Brewin, Dalgleish, & Joseph, 1996). Instead it suggests that they are

normal memories functioning under extreme situations (Rubin, Berntsen, & Johansen, 2008). This model suggests that PTSD is developed and maintained through the explicit memory of a particular event, but acknowledges that implicit memory processes may too contribute to symptomatology. According to this model the trauma memory is constructed through the individual's current attitudes, goals, concerns and is affected by individual differences (e.g., gender, intelligence, dissociation, subjective states of emotion, remembering of more objectively observable information and aspects of personality). The constructed trauma memory is subject to change over time, but the more available and self-defining the memory, the more likely it is to result in PTSD. Suggesting, it is the memory of the trauma, rather than the event itself which leads to PTSD symptomatology.

The "mnemonic model" is based on theoretical finding that the schema violations do not necessarily lead to memory fragmentation (Schank, 1982, 1999). Additionally, emotionally salient memories are processed more due to their heightened personal relevance and distinctiveness (Cahill & McGaugh, 1998), thus are better remembered (Hunt & McDaniel, 1993; McGaugh, 2003) and more accessible (Brewer & Treyens, 1981; Brown & Kulik, 1977; Rubin & Kozin, 1984).

This model uses the concept of memory to describe the changes that take place in a person after trauma. Berntsen and Rubin (2006, 2007) suggest that as trauma violates the schema of the person, it is harder to process and becomes poorly integrated into ones self-narrative (e.g., Ehlers & Clark, 2000; van der Kolk & Fisler, 1995). Highly accessible and vivid personal memories give meaning and structure to our life narrative. They help to anchor and stabilise our concept of ourselves (e.g., Baerger & McAdams, 1999; Pillemer, 1998, 2003). As schematic deviations of the trauma memory leave it accessible (Brewer & Treyens, 1981; Brown & Kulik, 1977;

Rubin & Kozin, 1984), it becomes used as a cognitive reference point which influences the organisation of other autobiographical memories and new information. Thus, the trauma may become central to the person's identity, a turning point in his or her life story and/or a reference point or anchor for the attribution of meaning to other experiences and autobiographical memories in the self-system (Conway & Pleydell-Pearce, 2000; Pillemer, 1998). Endeavours to amalgamate trauma-related turning points within the pre-existing life story may alter the survivor's self-concept, with the trauma becoming further anchored in identity. Consequently, there is a positive correlation between level of PTSD symptoms and the degree to which the traumatic memory is seen as central to the person's life story and identity (Berntsen & Rubin, 2006).

This model provides a contrary standpoint to the prevalent view that PTSD is associated with a trauma memory that is hard to access (Dalgleish, 2004). It acknowledges individual differences in the development of trauma-centred identity, and the centrality of the trauma to ones sense of self. It suggests that if a trauma becomes central to the self, people may be biased in their whole self-representation as they would be likely to recall things in a congruent manner. Thus, the role of trauma-themed identity should be explored in future research looking at the relationship between PTSD and self. However variations in self construct or the specific mechanisms of the centrality to the sense of self still require further conceptualisation. The importance of control and appraisals in relation to PTSD, were not considered in this model.

1.4.7 Summary.

In this section contemporary PTSD models were presented. Attention has been given to conceptualising the mechanisms underlying PTSD and the alterations

of self due to trauma. A majority of the models presented support the prominent view that the trauma memory is distinct to other memories (Brewin, Dalgleish, & Joseph, 1996). For example, the DRT (Brewin, 2011) associates PTSD with identity fragmentation, the SPAARS (Dalgleish, 2004) proposes an incongruity between the trauma memory and pre-trauma schemas, the SMS (Conway & Pleydell-Pearce, 2000) associates the trauma memory with challenging the goals of the working self, and the cognitive appraisal model (Ehlers & Clark, 2000) associates trauma with negative self-appraisals. Conversely, Berntsen and Rubin (2006) present an alternative view that the trauma memory is not qualitatively different, just a normal memory functioning under unique circumstances. They suggest that the trauma memory may become a reference point, from which future information is encoded and recalled.

The fundamental role of negative self-appraisals was emphasised by these models. Brewin (2011) suggests that negative trauma related cognitions arise because the trauma prevents retrieval of positive self identities. Ehlers and Clark (2000) illustrate the centrality of appraisals for the development and maintenance of PTSD. Dalgleish (2004) explain the importance of appraisals at different levels of cognition in relation to PTSD. The role of control was considered by Brewin and Holmes (2003) who highlighted the role of control in the development and treatment of PTSD. Ehlers and Clark (2000) highlighted that less control leads to greater trauma-appraisals. Conway and Pleydell-Pearce (2000) explained that control over the trauma is important for wellbeing. None of the models considered the role of control over the different parts of the self in relation to trauma.

A common limitation amongst these models is their inability to detail the precise nature of the self-representation. This is important as it may help to bridge

the gap between theory and practice, providing clinicians with a more tangible way for working with the self in trauma survivors. Additionally, the important role of appraisals and control were not consistently considered in all models.

1.5 Empirical evidence for the influence of trauma on the self in those with PTSD

1.5.1 Introduction.

Trauma-related disorders bring about structural changes to the self to varying degrees (Dalgleish & Power, 2004; van der Hart et al., 2006). This section will summarise the empirical evidence for the impact of trauma on the self.

1.5.2 Autobiographical memory disturbance in combat-related PTSD.

McNally, Lasko, Macklin, and Pitman (1995) conducted a study looking at autobiographical memory in combat-related PTSD. This study was based on prior research, which showed that trauma can change one's cognitive representations of the self (e.g., Janoff-Bulman, 1989; McNally, 1993). For example, because of the trauma individuals who develop PTSD may see themselves as weak, vulnerable and unworthy. Furthermore, positive autobiographical memories which could challenge these beliefs may be more difficult for PTSD patients to access (Brewin & Holmes, 2003).

In this study a sample of American Vietnam veterans with and without PTSD were used. The methodology involved an autobiographical cuing paradigm, whereby veterans were asked to retrieve specific personal memories in response to positive and negative cue words. The results showed that participants with PTSD had more trouble retrieving specific autobiographical memories than did participants without PTSD. This difference was most evident when participants were asked to retrieve autobiographical memories about positive traits. This, difference illustrates

that PTSD is characterised by diminished accessibility of positive information about the self. Additionally, veterans with PTSD who attended the experiment wearing military regalia (e.g., war medals) recalled significantly more war-related memories than veterans with PTSD who did not wear regalia. The researchers postulated that by wearing military regalia, veterans demonstrated the importance of their military service to their identity. However, this finding was discovered during the study and the researchers had not predicted it in advance. The study concluded that difficulties remembering one's past might underlie difficulties envisioning one's future, as reflected in the PTSD symptom of 'future foreshortening'. Furthermore, difficulties retrieving specific autobiographical memories which demonstrate positive traits may reflect disturbances in self-representation (McNally, 1993). This may contribute to PTSD symptoms such as dysphoria or emotional numbing.

This study used a small all male sample, potentially limiting generalizability. Additionally, the statistical power was low because regalia effects were not predicted *a priori*. However, this research was the first to suggest the importance of considering self-representations following trauma. It also demonstrated that trait words may be an effective way to assess ones post-trauma representation of the self. As this is the first study of its type, the findings are preliminary and warrant replication.

1.5.3 Self-defining memories.

Sutherland and Bryant (2005) examined the relationship between trauma survivors' personal goals and the retrieval of self-defining memories in PTSD. Self-defining memories comprise narratives that individuals draw on to inform their sense of self (Blagov & Singer, 2004). Self-defining memories are deemed more important and personally relevant than standard autobiographical memories. Typically they are

affectively intense, vivid and comprise enduring self-concerns (Singer & Salovey, 1993). The examination of self-defining memories is important because trauma is thought to alter ones self-construct, especially when it results in PTSD (Sutherland & Bryant, 2005).

In this study Sutherland and Bryant (2005) used a small civilian sample of 17 trauma survivors with PTSD, 16 trauma survivors without PTSD, and 16 controls who had not been exposed to trauma and did not have PTSD. All participants were asked to provide autobiographical memories of events that they felt shaped who they are. They were also asked to provide details about their personal goals and to complete PTSD symptomatology questionnaire measures. They found, participants with PTSD reported significantly more trauma related self-defining memories, of a negative valence, from adult years as compared to non-PTSD and control participants. Their results demonstrated that trauma survivors who develop PTSD see themselves as being strongly influenced by their trauma when compared to those who do not develop PTSD. These findings are in accordance with research that has illustrated that people with PTSD integrate their trauma experience into their current identities (Berntsen, Willert, & Rubin, 2003). They also support research which demonstrates that PTSD sufferers are deficient in retrieving positive autobiographical memories (e.g., Kangas, Henry, & Bryant, 2005).

The study's strengths include the use of a non-trauma exposed control group to ensure that findings were not the result of a predisposition to recall negative events. The trauma type (i.e., motor vehicle accident and assault survivors) was controlled across PTSD and non-PTSD groups, meaning that the trauma type did not confound the relationships detected. However, the self-defining memories were subjectively coded in valence by the researchers, without any input from the

participant. Thus, there was a chance that the subjective valence of the event was misrepresented. The authors acknowledged further limitations in their discussion; these included the possibility of order effects (i.e., eliciting self-defining memories prior to eliciting goals may have biased reporting of goals) and the small sample size, which limits confidence in statistical outcomes. This sample was predominantly female. As PTSD sufferers were recruited into the study based on having PTSD this may have biased them to selectively retrieve memories and goals that were related to their traumatic experiences. Finally, the controls were more symptomatic than the non-PTSD participants, thus may not have represented a healthy sample.

1.5.4 Centrality of Events.

Accessible and vivid personal memories help to give meaning and structure to our life narratives, thus stabilising our sense of self (e.g., Baerger & McAdams, 1999; Pillemer, 1998, 2003). Due to their distinctiveness and emotional impact trauma memories often remain accessible, forming a reference point for the organisation of less salient experiences in the person's life (Berntsen & Rubin, 2006). There is a growing body of research suggesting that the centrality of event is fundamental for understanding the differential impact of trauma exposure for the development of PTSD. Berntsen and Rubin (2006) argued that greater centrality of a traumatic event is associated with more severe PTSD. Greater centrality causes the negative emotionality of the trauma to become an anchor from which all non-traumatic events become associated with. Consequently, people may see their lives in an oversimplified manner, where they are biased to recalling events which can be explained by making reference to the trauma and ignore aspects that defy such causal attributions (Berntsen & Rubin, 2006). This maintains a sense of current threat, leading to rumination and worries which are fuelled by negative cognitions about the

self and ones future. Theorists, such as Fitzgerald (1988), argue that the way we compose our life story is related to how we understand ourselves. Thus, if a trauma memory is seen as a central turning point in our life story it may also be regarded as a central component of our personal identity and for the organisation of autobiographical knowledge. It also has an impact on the interpretation of non-traumatic experiences and expectations of the future (Berntsen & Rubin, 2007). This perspective is contrary to the widespread view that trauma creates a profound imbalance in the mind of the victim and violates the schema of the person, making it hard to process and integrate with other memories (e.g., Ehlers & Clark, 2000; van der Kolk & Fisler, 1995). Instead this model suggests that trauma is an unusual, unexpected and emotionally salient event which violates our schema-driven expectations.

Berntsen and Rubin (2006, 2007) created the 'Centrality of Events Scale' (CES), to measure the extent to which the memory of a stressful event forms a reference point for personal identity and attribution of meaning to other experiences in a person's life. To measure the centrality of the event a 20-item Centrality of Event Scale (CES) and a 7-item short form was constructed (Berntsen & Rubin, 2006). The CES asks people to rate their answers to questions relating to the most stressful/traumatic event in their life's on a 5-point scale (1=totally disagree; 5=totally agree). The CES measures the extent to which the trauma memory becomes (1) a reference point for everyday inferences, (2) a turning point in the life story and (3) a central component of personal identity.

A number of studies have tested the validity and utility of the CES, assessing its applicability for different clinical presentations. Whilst it is not possible to mention them all here, a brief overview of some key findings will be presented.

Berntsen and Rubin (2006) tested the CES on a student population (*N*=707) and found CES-scores were related to PTSD severity even after controlling for depression, anxiety, dissociation and self-absorption. This research supports the notion that placing a traumatic event at the centre of one's identity may contribute to the development and maintenance of PTSD symptoms. Furthermore, the centrality of the memory may increase its accessibility, and serve as a filter through which present and future events are perceived (Brown, Antonius, Kramer, Root, & Hirst, 2010). However, this study was limited to a student population, limiting generalizability.

A study by Berntsen, Rubin, and Siegler (2011) looked at the differential role of emotionally positive and negative life events in the organisation of the life story and one's identity. They recruited a large sample (*N*=2526) of adults in their sixties who completed the CES for both the traumatic event which had troubled them the most and also for their most positive life event. The results showed that the centrality of positive events were unrelated to PTSD symptomatology and measures of emotional distress. The centrality of negative events showed a clear positive correlation to PTSD symptomatology and emotional distress. Interestingly they found that positive events become central through their correspondence with cultural norms. Whereas, negative events become central because of the emotional distress they cause. This study was limited by the differential sampling of positive and negative events, the extensive time gap (as long as 18 years) between collecting the corresponding measures and the cohort effects of conducting research with an older sample. The correlation between CES and PTSD symptomatology has been verified for a range of trauma types including mixed trauma (Berntsen & Rubin, 2007), women survivors of childhood sexual abuse (Robinaugh & McNally, 2011), war

veterans (Brown, Antonius, Kramer, Root, & Hirst, 2010) and bombings (Blix, Birkeland, Hansen, & Heir, 2014).

The distinctiveness of the trauma memory may cause it to become central to ones sense of self, distorting ones perception of previous and subsequent life events (Berntsen & Rubin, 2006). The CES-scale successfully demonstrated that those who rate the trauma as being more central to their sense of self, also experience greater PTSD symptomatology (e.g., Berntsen & Rubin, 2006). Future research looking at the relationship between PTSD and the self, must consider the impact of trauma-themed identity. The examination of a structural model of self may help detail how the centrality of the trauma is represented in the self.

1.5.5 Summary.

In this section the empirical evidence for the relationship between trauma-centred identity and PTSD was outlined. Several PTSD models (e.g., Ehlers & Clark, 2000; Herman, 1992), suggest that a failure to integrate a trauma with other autobiographical memories contributes to greater PTSD. McNally, Lasko, Macklin, and Pitman (1995) propose that trauma changes one's cognitive representation of the self, whereby PTSD sufferers have more trouble recalling positive autobiographical knowledge. Sutherland and Bryant (2005) argue that participants with PTSD report more trauma related self-defining memories, as compared to non-PTSD, trauma-exposed and healthy non-trauma-exposed participants. Finally, Berntsen and Rubin (2006, 2007) propose that the trauma becomes a central organising force in one's memory. All of these empirical studies consider the role of the self in relation to memory. However, none of them made attempts to detail how the self is represented in memory, neither did they test their assertions on existing self-structures (i.e., schemas, associative networks, self-complexity theory). If clinicians had a way of

accessing their client's self-representations, they would be better able to support their clients to overcome the profound impact that trauma has on their sense of self. Furthermore, the models only look at the self and trauma; they fail to incorporate other fundamental features (i.e., appraisals and control) that might be important to better understand this relationship.

1.6 Implications for treatment

1.6.1 Treatment based on PTSD models.

Treatment represents an attempt to translate theory into practice, by addressing the processes which lead to PTSD symptomatology, as outlined by the PTSD models (see section 1.4). Psychological models of PTSD suggest that recovery requires an integration of the different aspects of the trauma memory and the pre-trauma autobiographical knowledge (Conway, 2005; Ehlers & Clark, 2000). Considering the profound impact that trauma has on the self, the self should be a central target of treatment. However, treatment often predominantly focussed on trauma memories and cognitive appraisals (Resick, 2001).

NICE (2005) reviewed the PTSD evidence base and recommended trauma-focused cognitive behavioral therapy (CBT) and eye movement desensitization and reprocessing (EMDR) for the treatment of PTSD. It emphasised the importance of focusing on both the memory and its meaning. These therapies are outlined below.

1.6.2 Exposure therapy, cognitive behavioural therapy and EMDR treatment.

Exposure therapy is a type of behavioral therapy, which forms an integral component of cognitive treatment for trauma and other disorders where avoidance is central (Marks, 1987). During exposure, the therapist identifies the thoughts,

emotions and physiological reactions that accompanied the trauma. Then the individual is exposed to the feared stimuli until habituation is reached (De Silva & Rachman, 1981), and previously learned associations between feared stimulus (e.g., objects, activities, situations) and negative outcomes are overcome. This often happens in parallel to the acquisition of relaxation skills. Exposure procedures have several variants which can be used together or separately. These include systematic desensitisation (Wolpe, 1958), in vivo exposure, imaginal exposure/re-living, virtual reality exposure (e.g., Krijin, Emmelkamp, Olafsson, & Biemond, 2004), prolonged exposure, interceptive exposure (Abramowitz, Deacon, & Whiteside, 2010) and flooding (Keane, Fairbank, Caddell, & Zimmering, 1989). Exposure provides individuals with a safe space to learn more realistic information about their feared stimulus, and their ability to overcome their fears. Enabling individual's to challenge and update their trauma-appraisals, including those pertinent to the self (Ehlers & Clark, 2000).

The DRT (Brewin, 2001, 2003) proposes that restricted attention during a trauma leads to more detailed perceptual representations being constructed in the image based memory (SAM) system, as compared with the verbally accessible memory (VAM) system. Exposure to trauma cues (particularly sensory ones), increases access to the VAM system enables the trauma memory to be processed and contextualised amongst ones autobiographical knowledge. This reduces the emotional salience of the memory and increases perceptions of control over it (Brewin, 2001), as individuals can use other self-knowledge to challenge trauma appraisals. This reduces symptomatology like flashbacks and intrusive memories. Similarly, the mnemonic model (Berntsen & Rubin, 2006) proposes that reducing the vividness of the trauma through exposure, reduces the centrality of the trauma

memory to ones sense of self and PTSD symptomatology. However, accommodating the trauma into ones self-schema may create a trauma-centred identity which can increase PTSD symptomatology. Ehlers et al. (1998) reported that those who suffered mental defeat during the trauma or felt that their self had been permanently negatively changed by the event were less likely to benefit from exposure.

Trauma-focussed CBT is strongly rooted in Ehlers and Clark (2000) assertion that appraisals of the trauma and the trauma memory underpin PTSD. Thus, it aims to modify negative appraisals, reduce re-experiencing and eradicate maladaptive coping strategies (Ehlers, Clark, Hackmann, McManus, & Fennell, 2005). It teaches clients to identify, evaluate, and reframe the dysfunctional trauma-appraisals which lead to PTSD symptomatology (Ehlers & Clark, 2000). It is time limited, structured, collaborative and problem oriented. For each patient an individualised version of the Ehlers and Clark's (2000) PTSD formulation is developed. This, allows the therapists to explore the client's unique appraisals, memory characteristics, triggers, behaviors and cognitive strategies which are thought to maintain PTSD symptomatology. Trauma-focused CBT utilises techniques such as exposure, cognitive restructuring, psychoeducation and anxiety management. NICE (2005) recommends 8-12 regular sessions for a single trauma, with more sessions for complex trauma.

Other evidence based forms of CBT for PTSD include: 'Stress-inoculation training' (SIT; Meichenbaum, 1996) and 'Cognitive-processing therapy' (CPT; Resick & Schnicke, 1992, 1993). In SIT clinicians teach clients coping strategies (i.e., breathing, muscle relaxation, positive self-talk), so that they can manage their anxiety. This treatment has three stages; conceptualization, skill acquisition and rehearsal, and follow through. SIT typically consists of 8-15 sessions, plus booster

and follow-up sessions. It can be delivered to individuals, couples, and groups. CPT was originally developed for the treatment of victims of sexual assault. It encompasses the common aspects of CBT, but places a greater emphasis on cognitive strategies. It aims to enable patients to better understand and modify the meaning attributed to their trauma. Clients are encouraged not to avoid the trauma memory, so that associated beliefs and meanings can be explored and challenged. In CPT clients write an account of their trauma and their associated feelings, then read this daily. CPT typically consists of 12 sessions and has been shown to be effective in treating PTSD across a variety of populations.

During CBT clients are supported to elaborate the trauma memory which challenges the maladaptive trauma appraisals and contextualises them in memory (Ehlers & Clark, 2000). Exploring alternative pre-existing identities and linking them to the trauma experience, can both modify and integrate the trauma identities (e.g., “I am weak” or “I am vulnerable”) into a more balanced perspective of the self (Brewin & Holmes, 2003). Brewin and Holmes (2003) suggest that trauma blocks the retrieval of positive self-identities and activates pre-existing negative self-identities, resulting in negative trauma related cognitions. Reasserting perceived control and enhancing positive identities by making them more distinct can help reduce PTSD symptomatology. Brewin, Dalgleish and Joseph (1996) suggest that trauma focused treatment must reduce the discrepancy between the trauma and prior assumptions, as large discrepancies make the trauma memory hard to process. Janoff-Bulman (1992) suggested that trauma violates ones beliefs about the self as invulnerable, thus successful treatment requires a change in beliefs about the self.

Eye Movement Desensitization and Reprocessing (EMDR; Shapiro, 1989) aims to enable survivors to change how they feel about their trauma memories.

According to Shapiro, when a trauma occurs, it overwhelms normal cognitive and neurological coping mechanisms. The trauma memory is then inadequately processed and stored in an isolated memory network (Shapiro & Laliotis, 2012). The goal of EMDR is to process these distressing memories, allowing clients to develop more adaptive coping mechanisms. This is based on the premise that it is the unprocessed nature of trauma memory which results in PTSD symptomatology (Brewin, 2003; Conway & Pleydell-Pearce, 2000; Dalgleish & Powers, 2004). Dalgleish and Power (2004), suggest that processing the trauma, reduces PTSD symptomatology and enables the trauma to be integrated into ones sense of self. In EMDR clients are instructed to focus on the images, emotions and thoughts associated to the trauma memory while the therapist performs bilateral stimulation (i.e., the therapist's fingers moving from side to side in front of their eyes or another type of rhythmic, left-right stimulation, such as hand taps or sounds) (e.g., Feske, 1998; Seidler & Wagner, 2006). Following bilateral stimulation, clients are encouraged to let go of the trauma memory and to discuss the images and emotions they experienced. This process is repeated until the client feels less distressed about the memory. Then they are asked to concentrate on the memory while simultaneously having a positive thought. This is in line with Brewin and Holmes (2003) who suggest that creating new SAMs which are paired with the trauma image reduces arousal.

Bilateral stimulation is thought to work by "unfreezing" the brain's information processing system, which is interrupted in times of extreme stress. EMDR has been shown to successfully reduce the vividness and emotionality of trauma memories (e.g., Gunter & Bodner, 2008; Maxfield, Melnyck, & Hayman, 2008). Eye movements have been found to have an impact on cognitive processes

and physiology. They appear to enhance episodic memory (Propper & Christman, 2008) and cognitive flexibility (Kuiken, Bears, Miall, & Smith, 2002), aiding with the process of integrating the trauma into ones sense of self. Physiological changes observed during an EMDR session include, decreased heart rate/skin conductance, increased high-frequency heart rate variability (parasympathetic tone), and increased finger temperature and breathing rate (Sondergaard & Elofsson, 2008). These changes are thought to help reduce the emotional salience by providing a context of dearousal (e.g., Aubert-Khalfa, Roques, & Blin, 2008). Neuroanatomically, EMDR has been associated with increased hemispheric communication (Propper & Christman, 2008), hippocampal volume, and pre-frontal lobe metabolism (Levin, Lazrove, & van der Kolk, 1999). Decreases in limbic, anterior cingulated, and basal ganglia activity (Lansing, Amen, Hanks, & Rudy, 2005). However, most of these studies did not implement a control group and were conducted using a very small sample size. Thus, further research is required so that the physiological mechanisms underpinning EMDR can be better understood.

1.6.3 Evidence for the effectiveness of psychological therapies for PTSD.

Exposure therapy reduces PTSD severity following combat (e.g., Cooper & Clum, 1989), road traffic accidents (e.g., McCaffery & Fairbank, 1985), rape and nonsexual assault (e.g., Resick, Nishith, Weaver, Astin, & Feuer, 2002) and other traumatic events (e.g., Marks, Lovell, Noshirvani, Livanou, & Thrasher, 1998). Some theorists argue that exposure therapy has gained the most empirical support to date (Rothbaum, Meadows, Resick, & Foy, 2000).

In many clinical guidelines for PTSD, CBT is often the treatment of choice. For example, the NICE (2005) guidance for PTSD reviewed 24 randomised controlled trials (RCT) looking at the treatment of PTSD and found the gold standard

for treatment to be trauma-focused CBT as compared to wait-list, relaxation or supportive counselling. Resick (2001) reviewed seven studies using cognitive therapy to treat PTSD, and found that both cognitive and exposure therapy clinically reduced symptomatology. A systematic review (Mendes, Mello, Ventura, Passarela, & Mari, 2008) on the effectiveness of CBT for PTSD, compared 23 clinical trials and found that CBT had better remission rates than EMDR or supportive therapies. CBT was comparable to Exposure Therapy and Cognitive Therapy, in terms of efficacy and compliance, and they were all more effective than supportive techniques in the treatment of PTSD. Trauma-focused CBT has been associated with faster recovery and reduced re-experiencing symptoms after five months (Foa, Hearst-Ikeda, & Perry, 1995). It has also been associated with a reduction in the number of participants who met diagnostic criteria for PTSD after six months (Bryant, Harvey, Dang, Sackville, & Basten, 1998). In participants with a previous diagnosis of chronic PTSD, positive outcomes were maintained at six months follow-up (Marks, Lovell, Noshirvani, Livanou, & Thrasher, 1998; Resick & Schnicke, 1992; Tarrier et al., 1999).

Davidson and Parker (2001), conducted a meta-analysis of 34 studies, and showed that EMDR was as effective as exposure and CBT, and more effective then no treatment, with nonspecific therapies and with patients' condition before treatment. Additionally, EMDR has been found to improve the negative symptoms of PTSD such as poor sleep, low mood, anxiety and poor quality of life (Raboni, Tufik, & Suchecki, 2006). Seidler and Wagner (2006) conducted a systematic review on the literature published from 1989 to 2005 and identified eight publications describing treatment outcomes of EMDR and CBT. They found that superiority of

one treatment over the other could not be demonstrated, and trauma focused CBT and EMDR tended to be equally efficacious.

A recent comprehensive review (Bisson, Roberts, Andrew, Cooper, & Lewis, 2013) compared the efficacy of 70 RCTs of individual trauma-focused CBT (TFCBT), EMDR, non-trauma-focused CBT (non-TFCBT), other therapies (supportive therapy, non-directive counselling, psychodynamic therapy, stress management and present-centered therapy), group TFCBT, or group non-TFCBT. The results showed that individual TFCBT and EMDR were more effective than waitlist or treatment as usual, in reducing clinician-assessed PTSD symptoms. Other non-trauma-focused psychological therapies did not reduce PTSD symptoms as significantly. There were no statistical differences between individual TFCBT, EMDR and stress management immediately post-treatment although there was some evidence that individual TFCBT and EMDR were superior to non-TFCBT at one to four month follow-up. Additionally, individual TFCBT, EMDR and non-TFCBT were more effective than other therapies. Non-TFCBT was more effective than waitlist/usual care and other therapies. Other therapies were superior to waitlist/usual care control as was group TFCBT.

Whilst NICE (2005) recommended treatments have proven to be effective, as many as 70% of clients may not benefit significantly (Hembree & Foa, 2000). Furthermore, around 14% of patient's drop-out of trauma focused CBT, and as many as 50% drop-out of exposure therapy (Davidson & Connor, 1999; Hembree & Foa, 2000). Further research is required to enhance to efficacy and tolerability of treatments.

1.6.4 Summary.

This section outlined the prominent treatments for PTSD and their evidence base. Without a structural representation of the self, therapeutic interventions are limited to working on individual self-appraisals. A structural model of the self could enable clinicians to better understand the impact of the trauma on the self as a whole. Most PTSD treatment models spend some time, addressing control. For example, exposure work makes explicit efforts to enhance the clients control over the trauma memory. However, the therapeutic focus of control is limited to helping trauma survivors gain control over their trauma memory alone. It is possible that other aspects of control (i.e., control over the different parts of the self) might also be important for recovery. Thus, research into the other components of control when providing treatment for those with PTSD is essential.

1.7 Self-complexity

The theoretical and empirical evidence of PTSD highlights the need for research to better understand the role of the self in PTSD. It is possible that assessing the utility of structural models which illustrate how the self is represented in memory might facilitate this process. This next section will present the theory of self-complexity, and explore why it might be a suitable model to look at in relation to PTSD.

1.7.1 Introduction.

Research has begun to borrow concepts regarding the self from social psychology and apply them to mental health research. A particular theory regarding the self that, to date has not been extensively considered in terms of PTSD and might be beneficial to explore in regards to trauma, is self-complexity (SC) (e.g., Linville, 1985, 1987). SC has been studied in relation to other disorders (e.g., depression,

eating disorders and personality disorders) but has only been investigated once in relation to trauma (Morgan & Janoff-Bulman, 1994). Since then there is a greater understanding of the SC theory, therefore it is necessary to review the initial study and other fundamental publications to date. Furthermore, SC has been unique in detailing its role as a moderator of life events relating directly to wellbeing. This section will define SC and present an overview of the empirical evidence surrounding it. This overview will include a systematic literature review conducted by the author.

1.7.2 Definition of self-complexity.

SC (Linville, 1985, 1987) refers to ones perceived knowledge about the self, based on the characteristics they feel they possess. It is thought to be the dimensionality underlying the self-concept (Rafaeli-Mor & Steinberg, 2002). It is comprised two parts; firstly, the number of self-aspects (i.e., roles, relationships, activities or contexts) that one uses to cognitively organise knowledge about the self (i.e., teacher, friend and daughter). Secondly, the degree of relatedness amongst the traits (i.e., happy, curious, artistic) used in describing these different aspects (Linville, 1985, 1987). Greater SC involves having more self-aspects with a strong distinction among the traits used to define each aspect.

SC is measured using a trait sort task, whereby participants put traits into groups that represent meaningful aspects of their lives, referred to as 'self-aspects' (Linville, 1985). The card sorting method for measuring the organisational properties of cognitive structures was originally developed by Zajonc (1954, 1960). Each social role (e.g., teacher, carer, bus driver), kind of relationship (e.g., wife, cousin, friend), type of activity (e.g., dancer, cook, writer), goals (e.g., to finish university, to become an accountant, to have a family), characteristic (e.g., thoughtful, funny,

honest) and so forth, may serve as a self-aspect. The instructions are open ended, encouraging respondents to represent their self-aspects and the traits that are self-descriptive of them in their own idiosyncratic fashion. Self-representations differ in terms of both the number of self-aspects and the degree to which the distinctions are made among self-aspects (i.e., the extent to which they are represented by different cognitive elements). Based on these trait sorts, a SC score is calculated that captures both the number of self-aspects generated and the degree to which the traits ascribed to each self-aspect are distinct from one another (Linville, 1985). To operationalise SC, a dimensionality statistic, referred to as *H* is calculated (Attneave, 1959). Individuals obtain higher *H* scores if they utilise more aspects in their self-description, and have less redundancy amongst traits (Linville 1985, 1987). This measure addresses both differentiation (i.e., the extent to which cognitive domains contain multiple distinct elements) and integration (i.e., the degree of interrelatedness in the cognitive domain) (Rafaeli-Mor & Steinberg, 2002).

1.7.3 Self-complexity theory.

Linville's (1985, 1987) model of SC is built on four basic assumptions. The first assumption states that the self is composed of multiple aspects, each representing a meaningful domain of one's life (Linville, 1985). The self-aspects may include information about specific events and behaviours, generalisations developed from repeated observations of one's own behaviour, or other self-relevant knowledge such as traits (e.g., extravert), roles (e.g., dentist, father), physical features (e.g., attractive, fat), category membership (e.g., male, Christian), abilities (e.g., critical), preferences (e.g., vegetarian), autobiographical recollections (e.g., summer in Greece) and relations with others (e.g., trustworthy friend) (Linville, 1985; McGuire & Padawer-Singer, 1976). Additionally, the self-aspects might

contain information about specific events and behaviour (e.g., "I went for a run today") as well as generalisations developed over repeated observations (e.g., "I am brave"). These self-aspects are hypothesised to be held in memory as nodes within an associative network. With each self-aspect holding a unique set of associations with various cognitive, affective and evaluative nodes as well as with other self-representations. The strength of associations amid self-aspects differs, with some self-representations being more strongly interconnected than others. This view of a system of self-aspects is compatible with a number of self-representational models, such as: associative networks (Bower & Gilligan, 1979), schemas (Markus, 1977) or prototypes (Kuiper & Derry, 1981). We are biased to attend to self-relevant information in the environment (e.g., Brenner, 1973; Markus & Smith, 1981; Moray, 1959; Ross & Sicoly, 1979). Consequently, our view of the world is intrinsically linked to the self, due to the constant presence of the self in experiences where such data is encoded (Linville, 1985).

The second assumption states that affect is linked to specific aspects of the self. Self-aspects may have positive associations, negative associations or a combination of the two. For example, someone may feel good when thinking about themselves as a friend, but bad when thinking about themselves as an employee. Furthermore, an individual may hold a complex representation about themselves as an athlete, acknowledging that sometimes their performance is good making them feel pride, but at other times it may be bad making them feel shame and determination.

The third assumption suggests that people differ in the complexity of their self-representations. As well as having numerous self-aspects, it is also important that the self-aspects are differentiated. Whilst partial overlap is to be expected, total

overlap is more problematic. For example, if ones perception of themselves as a mother is highly linked to their view of themselves as a teacher, perceived failure in one domain may colour feelings about themselves in the other. If ones mother and teacher selves are distinctly different to one another, perceived failure in one domain will remain localised.

The final assumption suggests that individual aspects come together to create an overall view of the self. In other words, the nature of the self-representation can be accessed by an averaging model. Thus, whilst we are able to hold numerous self-aspects in mind we also hold an overall sense of self which represents an accumulation of the individual aspects.

These four assumptions lead to *the stress buffering effects* of SC (Linville, 1985, 1987). Linville (1985, 1987) argues that greater SC moderates the impact of adversity on one's mental health. This is because those who score higher in SC think about themselves in terms of numerous sub-selves which differ considerably from one another in terms of their defining attributes. Therefore, when a stressful event happens, it affects the self-aspect most pertinent to the stressor and other self-aspects sharing descriptive traits (Linville, 1985). If there is little or no overlap of traits with other self-aspects, the impact of the feedback can be confined to the targeted self-aspect. Thus, the SC theory argues that a higher number of self-aspects and fewer associative links (i.e., the aspects overlap minimally in the traits with which they are described) minimises the impact of the stressor to a specific self-aspect. As only a small proportion of the self will be affected by the stressor and the unaffected self-aspects can serve to moderate the event. For example, someone with low SC may conceptualise themselves to have only two roles (i.e., mother and wife) and may use quite similar traits to describe each role (i.e., friendly, caring, fun and entertaining).

Thus, if their ability to care as a mother is challenged, they may also worry about their ability to care as a wife, impacting on their whole self. Whereas, someone high in SC may see themselves as containing multiple aspects (i.e., mother, wife, friend, nurse, sister, woman, vegetarian, spiritual, runner, animal lover) and may use distinct traits to describe each of their roles. Thus, if one of their self-aspects is challenged, they may be able to minimise the impact of the event if they are able to see themselves positively in their other unrelated aspects. Linville (1985, 1987) hypothesises that these individual differences in SC play a role in emotional stability. Whereby, greater dimensionality buffers against stress-related illness and depression by providing an alternative focus of attention following a stressor (Linville, 1987).

1.7.4 Empirical support for self-complexity.

The first two studies investigating SC were conducted by Linville (1985, 1987). In the first study Linville (1985) conducted two experiments. In the first experiment, Linville asked participants to complete a SC trait sort, then provided them with feedback suggesting that they either performed well or poorly on an intelligence test. This type of feedback was selected as the participants were university students, so it was deemed to have important implications for their student self-aspect. Mood measures were collected prior to participants receiving this feedback and immediately after. The results showed that those lower in SC experienced greater changes in affect (i.e., greater positive mood when told they performed well and greater negative mood when told they performed poorly) and self-appraisal following a failure or success experience. In the second experiment a group of university students were asked to complete a SC task, then to complete daily mood measures for the next two weeks. Linville hypothesised that those lower in SC would experience greater variance in their mood over time. The results showed

that those lower in SC experienced greater variability in affect over a 2-week period. The results indicated that level of SC may provide a promising cognitive marker for vulnerability to depression and that high SC may be protective against stress related depressive symptoms. Overall, both parts of the study provided good support for Linville's stress-buffering hypothesis.

In the second study Linville (1987) conducted a prospective study to test the hypothesis that greater SC moderates the adverse impact of stress on depression and illness. The study revealed that participants higher in SC were less prone to depression, perceived stress, physical symptoms, and occurrences of influenza and other illnesses following high levels of stressful events. Potentially, indicating that vulnerability to stress-related depression and illness is partly due to differences in cognitive representations of the self (Linville, 1987). However, they found that the benefits of SC did not extend to people who had not experienced recent stressful events.

These initial studies by Linville (1985, 1987) evoked significant interest in the stress buffering effects of greater SC. They also inspired theorists to investigate the relationship between the stress buffering effect and a range of mental health presentations. These included, depression (Brown & Rafaeli-Mor, 2007; Campbell, Chew, & Scratchley, 1991; Miller, Omens, & Delvadia, 1991), narcissism (Rhodewalt & Morf, 1995), bipolar disorder (Alatiq, Crane, Williams, & Goodwin, 2010; Taylor, Morley, & Barton, 2007), auditory hallucinations (Bell & Wittkowski, 2009), eating disorders (Constantino, Wilson, Horowitz, & Pinel, 2006) and trauma (Morgan & Janoff-Bulman, 1994). The nature of the results were complicated, with some studies demonstrating the stress buffering effects of SC (e.g., Brown & Rafaeli-Mor, 2007; Linville, 1987; Morgan & Janoff-Bulan, 1994) and others not

(e.g., Alatiq, Crane, Williams, & Goodwin, 2010; Constantino, Wilson, Horowitz, & Pinel, 2006; Miller, Omens, & Delvadia, 1991). In order to provide an overview of the results so far, the findings from three literature reviews aimed at consolidating the literature in the field will be summarised.

Rafaeli-Mor and Steinberg (2002) did an extensive review of 70 studies, published between 1985-2000 in efforts to ascertain the overall empirical support for the relationship between SC and well-being and to clarifying the conditions under which SC buffers stress. A classic meta-analysis and a vote-counting procedure were utilised. The findings revealed that over a third of the studies found a positive relationship between SC and wellbeing (e.g., Campbell et al., 1990; Dixon & Baumeister, 1991; Linville, 1985, 1987); some found a negative relationship (e.g., Woolfolk, Novalany, Gary, Allen, & Polino, 1995) and others found no relationship (e.g., Hershberger, 1989; Koenig, 1989). The authors concluded that there is mixed support for the buffering hypothesis and a reported a surprising overall small relationship between greater SC and poorer well-being, as suggested by the mean effect size (r = -.04). However, they argued that the differences in findings may represent differences in methodology. Notably, studies tend to vary in how they measure SC making them hard to compare and possibly masking the stress buffering effects of SC.

In 2004 a subsequent review of the literature was conducted by Koch and Shepperd, in an attempt to explain the spread of results found in the field. They found a overall positive, moderate relationship between SC and coping. Also, high SC corresponded to effective coping with negative events. However, they did not give details of the size of this effect, and the method of the review and the papers under review were not clearly specified. Koch and Shepperd (2004) reiterated that

future research needed to include careful measurement and stronger definitions of SC in order to provide better support for the relationship. Specifically they suggested that attention needed to be paid into inconsistencies in how SC was measured, the type of designs used in SC studies and the utilisation of the *H* statistic.

In the last 10 years a number of papers have been published in this area but no subsequent reviews have been published. A systematic review was conducted by the author to consolidate the research looking at the relationship between SC and emotional wellbeing from 2004-2013. The following methodology was used to parallel and extend the searches conducted by the previous reviews (Koch & Shepperd, 2004; Rafaeli-Mor & Steinberg, 2002). An electronic systematic search was conducted using multiple databases on the 24th of June 2013. Due to the uniqueness of the term "self-complexity" no truncations or Boolean terms were necessary. Databases were searched independently to make use of their individual features. The searches conducted were as follows:

1) PsychINFO (1806-Present): "Self-Complexity" in title (*n*=101) and as keyword (*n*=192)
2) MEDLINE (1950-Present): "Self-Complexity" in title (*n*=23) and as keyword (*n*=38)
3) CINAHL (1981-Present): "Self-Complexity" in all text (*n*=69)
4) EMBASE (1980-Present): "Self-Complexity" in basic search (*n*=48) and in title (*n*=30)
5) Web of Science (1864-Present): "Self-Complexity" in title (*n*=64) and in topic (*n*=209)
6) Science Direct (1823-Present): "Self-Complexity" in title (*n*=52)

No articles were currently in print and the ancestry method did not detect any further studies. Articles citing the reviews by Rafaeli-Mor and Steinberg (2002) (Web of Science *n*=68, Scopus *n*=77) and Koch and Shepperd (2004) (Web of Science *n*=17, Scopus *n*= 23) were also screened for inclusion. The inclusion criteria was that the paper had to be published after 2004, in a peer reviewed journal, using an adult sample, in English and investigated the relationship between SC, as defined by Linville (1985, 1987), and emotional wellbeing. Dissertations, reviews, conference abstracts and books were excluded. Following the systematic search, all identified articles had their abstracts screened to ensure they investigated the relationship between SC and emotional wellbeing. All articles meeting this criterion were obtained and screened against the full inclusion and exclusion criteria, which were selected in line with the previous reviews (Koch & Shepperd, 2004; Rafaeli-Mor & Steinberg, 2002). Fourteen suitable articles were found, as illustrated in Figure 1 and summarised in Table 1. Papers were analysed in terms of their methodology and outcomes.

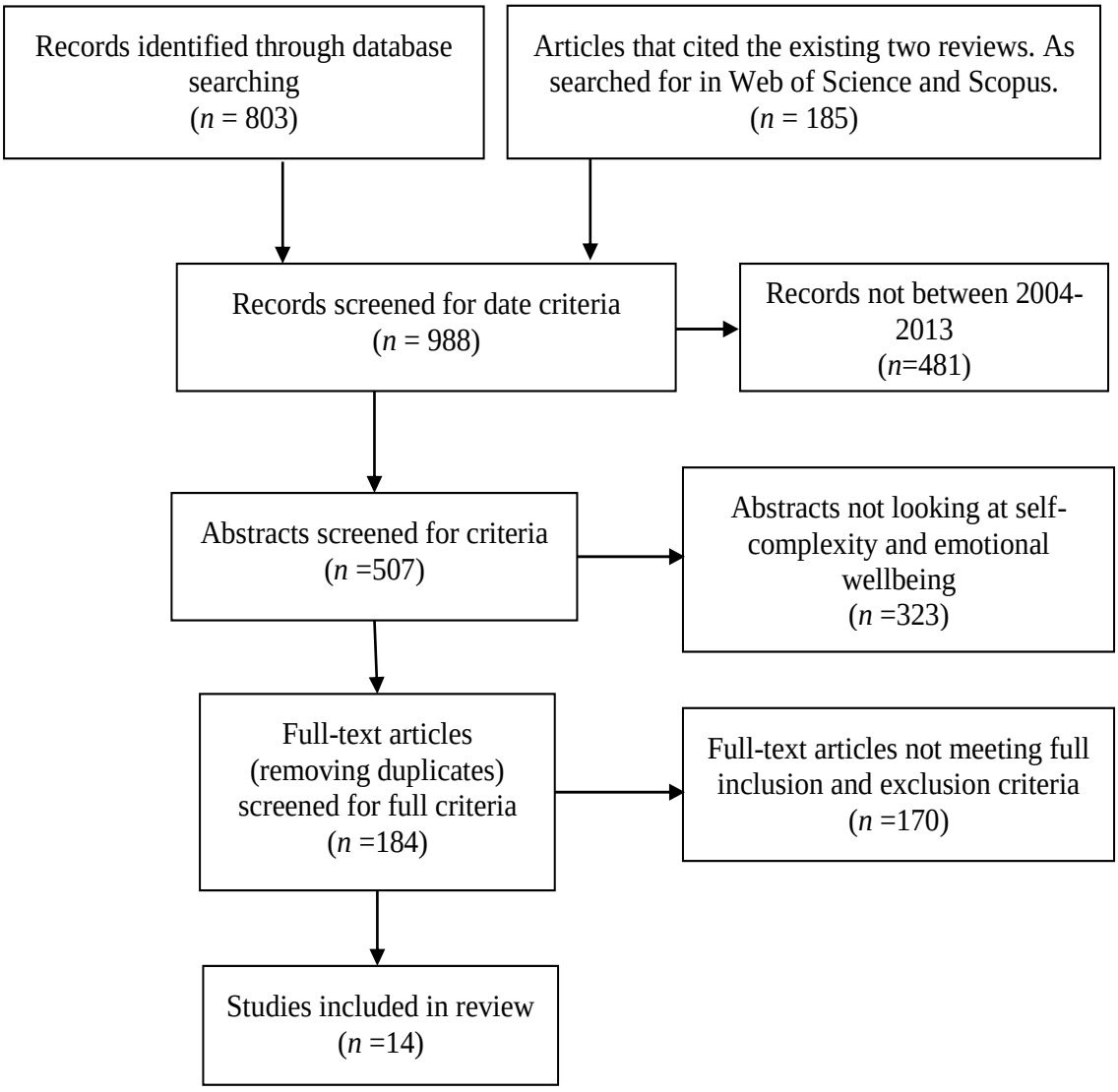

Figure 1. Flow diagram showing the stages of screening

Table 1

Characteristics of the articles meeting criteria

Reference	Design	Sample	Wellbeing measures	Was self-complexity protective?
1. Rothermund & Meiniger (2004); Germany	Study A&B: Prospective design. Regression analysis	Study A: Undergraduates (*n*=229, mean age=21.9 years, 73% women). Study B: Undergraduates (*n*=121, mean age=22.1 years, 75% women)	Study A & B: CES-D : Translated from English to German, ICSRLE, SRLE, HSUP and QAERDE	Study A: Yes (Negative experiences by SC; β= -0.12, $p<0.05$) Study B: No ($p>0.05$)
2. McConnell et al., (2005); USA	Study A&B: Prospective design. Multiple regression	Study A: Undergraduates (*n*=127). Study B: Undergraduates (*n*=105)	Study A: RSE, CHIPS, BDI, CSLES and PSS. Study B: CUS, Traumatic life events questionnaire. EASQ – Revised version. CES-D	Study A&B: No ($p>0.05$)
3. Schleicher & McConnell (2005); USA	Prospective design. Multiple regression	Undergraduates (*n*=110)	CSLES, CHIPS, BDI	Yes (Depression by SC; β=0.65, $p<0.01$)

4.	Ryan, LaGuardia, & Rawsthorne (2005); USA	Study A: Within subjects design. Regression. Study B: Prospective design. MANOVA	Study A: Undergraduates (*n*=89, mean age=19.74 years, 71% women). Study B: Undergraduates (*n*=113, mean age=19.16 years, 64% women)	Study A: CES-D, PSS, SVS, Emmons' 9-item checklist. Study B: CES-D, BDI, CHIPS, CSLES	Study A & B: No ($p>0.05$)
5.	Parker, Boldero, & Bell (2006); Australia	Within subject design. Regression analysis	Undergraduates (*n*=154, mean age=18.75, 71% female)	44 items of the MMPI-2	Yes (Borderline features by SC; $\beta= -0.15$, $p<0.05$)
6.	Constantino, Wilson, Horowitz, & Pinel (2006); USA	Study A: Within subjects design. Correlation. Study B: Prospective design. Multiple linear regression	Study A & B: Undergraduates (*n*=217, mean age=20.28, gender 82.5% female). 6 participants excluded due to extreme scores	Study A: BDI, SLCS, PSS and IIP. Study B: BDI, PSS and the CSLES	Study A&B: No ($p>0.05$)
7.	Showers, Zeigler-Hill, & Limke (2006); USA	Between subjects design. Factor analysis	*n*=356; emotionally maltreated (*n*=95), sexually maltreated (*n*=85) and low-maltreatment group (*n*=176)	Screening: LEQ. Study: BDI, RSE, SCL–90–R, DSQ, TSS, BFSPAI	Yes (Emotional maltreatment by SC; $\beta =0.14$, $p<0.05$)
8.	Brown & Rafaeli (2007); USA & Israel	Study A&B: Prospective studies. Simple correlations and multiple regression analysis	Study A: USA undergraduates (*n*=61, 6 excluded). Study B: Israeli undergraduates (*n*=70, 1 excluded)	Study A: Modified BDI. Stress measures (Brown & Rafaeli, 2007). Study B: Hebrew translations of CES-D, APES–OASV	Study A: Yes (Stress by SC; $\beta=0.22$, $p<0.05$) Study B: Yes (Depression by SC; $\beta=0.73$, $p<0.001$)

9. Taylor, Morley, & Barton (2007); UK	Between subjects design. 3 group comparison. ANOVA	*n*=52 participants: Remitted bipolar group (*n*=12, mean age 46.78 years, 83% females), recovered depressed group (*n*=16, mean age = 40.56, 63% female) and healthy controls (*n*=18, mean age=38.44, 61% female)	BDI, Mania rating scale, PANAS, NART	No ($p>0.05$)
10. Bell & Wittkowski (2009); UK	2 matched group groups. Between group comparison. T-tests, ANCOVA, Pearson's correlational analyses and hierarchical regression analyses	Clinical participants (*n*=22, mean age=42.7). Non clinical control (*n*=22, mean age=43.7)	PANSS, HADS, RSE, SRRS-R & WASI	No ($p>0.05$)
11. McConnell, Strain, Brown, & Rydell (2009); USA	Study A&B: Prospective design. Regression analysis. Study C: Within subject design. Multiple regressions	Study A: *n*=64 undergraduates (80% female). Study B: *n*=85 undergraduates (65% female). Study C: *n*=339 undergraduates (62% women)	Study A: RSE & BDI in Study B & C: CES-D and physical symptom inventory. Study C: NEO personality Inventory-Revised. FFM. NLO	Study A,B,C: No ($p>0.05$)
12. Brown & McConnell (2009); USA	Within subject design. Regression analysis	Undergraduates (*n*=76, 42% Women). 9 excluded from analysis	PANAS	Yes (Mood by SC; $\beta=0.38$, $p<0.05$)

13. Alatiq, Crane, Williams, & Goodwin (2010); UK	Between subjects design. 3 matched groups. ANOVA & Correlation	Remitted bipolar patients (*n*=40; 20 bipolar I and 20 bipolar II, mean age=40.94 years, 60% female). Remitted unipolar patients (*n*=20, mean age=34.49 years, 60% female) and healthy controls (*n*=20, mean age=29.64 years, 50% female)	Screening: The MINI International Neuropsychiatric Interview. Study: Structured interviews using the HAMD and the YMRS	No ($p>0.05$)
14. Stopa, Brown, Luke, & Hirsch (2010); UK and Australia	Study A: Within subject group. Simple correlations and step wise- multiple regressions. Study B: 2 groups, between subject design. ANCOVA and ANOVA	Study A: *n*=98 (aged 18-57, 71% female). Study B: High social anxiety (*n*=26, mean age=28.59). Low social anxiety (*n*=28, mean age=27.23)	Study A & B: SIAS, BDI-II, RSE	Study A&B: No ($p>0.05$)

Note. UK = United Kingdom; USA =United States of America; MANOVA = Multivariate Analysis of Variance; ANOVA = Analysis of Variance; ANCOVA = Analysis of Covariance; *n* = Number of participants; CES-D = Centre for Epidemiologic Studies Depression Scale (Radloff, 1977; German translated by Hautzinger & Bailer, 1993); ICSRLE = Inventory of College Students Recent Life Experiences (Kohn, Lofreniere & Gurevich, 1990); SLRE – Survey of Recent Life Experience (Kohn & MacDonald, 1992); HSUP = The Daily Hassels and Uplifts Scale (Kanner, Coyne, Schaefer & Lazarus, 1981); RSE = Rosenberg Self Esteem Scale (Rosenberg, 1965); QAERDE = Questionnaire for Assessing Emotionally Relevant Daily Events (Schmidt – Atzert, 1989); CHIPS = The Cohen – Hoberman Inventory of Physical Symptoms (Cohen & Hoberman, 1983); BDI = Becks Depression Inventory (Beck, Ward, Mendelson, Mock & Erbaugh, 1961); CSLES =College Student Stress Scale (Cohen, Kamarck & Mermelstein, 1983); CUS = Casual Uncertainty Scale (Weary & Edwards, 1994); EASQ – Expanded Attributional Style Questionnaire (Whitley, 1991); SVS = Subjective Vitality Scale (Ryan & Frederick, 1997); Emmons 9 item checklist (Emmons, 1991); MMPI-2 =Minnesota Multiphasic Personality Inventory (Bell, 1990); SLCS – Self Liking/Self Competence Scale (Tafarodi & Swann, 1995); IIP = Inventory of Interpersonal Problems (Horowitz, Alden, Wiggins & Pincus, 2000); LEQ = Life Experiences Questionnaire (Rose, Abramson & Kaupie, 2000); SCL-90-R = The Symptom Checklist-90-R (Deogatis, 1983); DSQ = The Defense Style Questionnaire (Bond, Gardner, Christian & Segal, 1983); TSS = The Splitting Scale (Gerson, 1984); BFSPAI = The Borderline Features Scale of Personality Assessment Inventory (Morey, 1991). Modified BDI = Modified Becks Depression Inventory (Beck, Rush, Shaw & Emery, 1979); Stress Measures (Brown & Rafaeli, 2007); APES – OASV = The Adolescent Perceived Events Scale: Older Adolescent Short Version (Compas, Davis, Forsythe & Wagner, 1987); Mania Rating Scale (Bech, Rafaelson, Kramp & Bolwig, 1978); PANAS = Positive and Negative Affect Scale (Watson, Clark & Tellegen, 1988); NART = National Adult Reading Test (Nelson, 1991); PANSS = The Positive and Negative Syndrome Scale (Kay, Fiszbein & Opler, 1987); HADS = The Hospital Anxiety and Depression Scale (Snaith & Zigmond, 1994); SRRS-R = The Revised Social Readjustment Rating Scale (Hobson et al., 1998); WAIS = The Wechsler Abbreviated Scale of Intelligence (Wechsler, 1999); NEO Personality Inventory Revisited = Neuroticism, Extraversion and Openness to Experience Personality Inventory (Goldberg's, 1999); FFM = Five Factor Model (John & Srivastava, 1999; McCrae & Costa, 1999); NLO = Negative Life Occurences (McConnell et al., 2005); MINI International Neuropsychiatric Interview (Sheehan et al., 1997); HAMD = The Hamilton Rating Scale (Hamilton, 1960); YMRS = The Young Mania Rating Scale (Young, Biggs, Ziegler & Meyer, 1978); SIAS = Social Interaction and Anxiety Scale (Mattick & Clark, 1998); BDI-II = Becks Depression Inventory – Two (Beck, Steer & Brown, 1996); PSS = The Perceived Stress Scale (Cohen, Kamarack & Mermelstein, 1983).

Fourteen articles, involving 2616 participants overall, were published from 2004-2013. Six of the articles consisted of two studies [1,2,4,6,8,14], and one consisted of three [11], for ease of reference different studies within one paper will be labelled a, b and c. Three designs were used across the studies; prospective [1,2,3,4b,6b,8,11], within subjects [4a,5,6a,11c,12,14a] and between subjects [7,9,10,13,14b]. However, all prospective designs included in this review used relatively short intervals (1, 2 or 4 weeks), which might not have been sufficient to capture SC's moderating effects. Within- and between-subjects designs are limited to relational hypotheses, thus are unable to make causal inferences about SC (Showers, Zeigler-Hill, & Limke, 2006).

Whilst eight studies had a direct clinical focus [4,5,7,8,9,10,13,14] only three utilised a clinical sample [9,10,13]. The remaining participants were university students who volunteered for course credit. The self-selecting nature of the participants reduced the external validity of the research (Bell & Wittkowski, 2009). A number of studies did not declare the age of their participants [2,3,7,8,11,12]. Of those that did the overall mean age was 31, in the clinical group it was 37 and the non-clinical group it was 20. Many studies did not report the gender composition of their sample [2,3,7,8]. Of those that did, a majority of the participants were female (67%). Most papers utilised a large enough sample size that would be expected for a small effect. However, two studies struggled to recruit adequate participants but acknowledged this limitation [8,9]. No studies reported power analysis, sampling errors, reporting bias or calculated 'number needed to treat'.

The search retrieved articles published in a range of areas: stress [1,3,4,6,12], control [2], authenticity [4], borderline personality disorder [5], childhood maltreatment [7], depression [8], bipolar [9,13], auditory hallucinations [10],

simplicity [11] and social anxiety [14]. Whilst it is positive that SC has been explored in many areas, it is limiting in that no area has been researched extensively and conclusions are frequently drawn about an area on the basis of individual studies. The measures used to assess these disorders were disparate; however a few measures were used in multiple studies. These included the CES-D measure of depression [1,2,4,8,11], the RSE [2,7,10,11,14], CHIPS [2,3,4,11,14], BDI [2,3,4,6,7,8,9,14], CSLES [2,3,4,6], the PSS [4,6] and the PANAS [9,12]. All studies gave full descriptions of the measures used, however the validity of the measures was inconsistently reported and the appropriateness of their use was never critiqued. Self-rating procedures were used in all studies, which allowed researchers to collect large amounts of data but were subject to social desirability biases, demand characteristics and individual differences in questionnaire completion (King & Bruner, 2000).

All studies used derivatives of the Linville (1985) task to measure SC, but they varied in the number of traits they used which might have implications for the construction and measurement of SC. Half of studies used Showers (1992) 40 trait set, composed of 20 positive traits and 20 negative traits, making it the most commonly used in this review. Discrepancies were found in the administration of the SC task, some studies delivered the task by computer [2,3,11,12] and others in person [1,4,5,6,7,8,9,10,13,14]. Table 2 summarises the overall strengths and weaknesses of each paper included in the review, based on the criteria critiqued above. Papers were given one point for each criterion they satisfied.

Table 2

Strengths and weakness of papers included in review

Reference	Prospective design	Mention ethics	Declare age and gender	Appropriate sample	Appropriate sample size	Shower's (1992) SC measure	Overall score
1.	Y	N	Y	Y	Y	N	4
2.	Y	N	N	Y	Y	Y	4
3.	Y	N	N	Y	Y	N	3
4.	Y	N	Y	N	Y	N	3
5.	N	N	Y	N	Y	N	2
6.	Y	N	Y	Y	Y	N	4
7.	N	N	N	N	Y	Y	2
8.	Y	N	N	N	N	N	1
9.	N	Y	Y	Y	N	Y	4
10.	N	Y	Y	Y	Y	N	3
11.	Y	N	N	Y	Y	Y	4
12.	N	N	N	Y	Y	Y	3
13.	N	N	Y	Y	Y	Y	4
14.	N	N	Y	N	Y	Y	3

Note. Y=Yes; N=No; Appropriate sample = Did the study recruit appropriate participants for its design? Appropriate sample size = Did the study recruit enough participants in line with its design and analysis, as calculated using post-hoc power analyses.

Six studies found support for the stress buffering effects of SC for emotional wellbeing [1,3,5,7,8,12], proposing important conceptual considerations for future

research. Furthermore, studies not supporting the original hypothesis contributed valuably to the knowledge base of SC.

McConnell et al. (2005), despite not finding support for the buffering hypothesis, found that individuals who perceived their different self-aspects to be less under their control experienced poorer well-being. Consequently, they argued that perceptions of control over one's self-aspect are the best predictor for those whom greater SC will be beneficial. However, this study relied on the use of a largely subjective Likert scale to measure self-aspect control and subsequent research has yet to retest these findings.

Many researchers in this review proposed other calculations that can be conducted in addition to *H* to give more information about the self structure. Schleicher and McConnell (2005) built on the original Linville (1985, 1987) model of SC by including a wider variety of attributes associated with the self in a way which was more sensitive to the relatedness among the attributes. This new conceptualisation held the advantage of providing a new means by which the relatedness among self-relevant attributes could be considered and measured. Constantino, Wilson, and Horowitz (2006) advocate for the use of separate SC calculations for differentiation and integration, as well as the use of additional measures of self-concept consistency and self-concept clarity. Showers, Zeigler-Hill, and Limke (2006) promote the use of SC calculations for compartmentalisation and proportion of negative attributes, as well as the addition of a measure of self-aspect importance. However, all of these new calculations and measures still require validation before they can be implemented in SC research as standard, leaving a caveat for future research.

Bell and Wittkowski (2009) explored the utility of SC in individuals experiencing auditory hallucinations. They conceptualised SC in terms of its positive and negative valence. They found that positive SC was positively associated with increased psychological wellbeing, whereas negative SC was inversely related. These findings illustrated the importance of considering SC in terms of its positive and negative valence. This study successfully recruited a clinical population, although the sample size was small (n=22). This study used disproportionately more negative than positive traits, potentially biasing their participants to create a more negative self-representation.

The studies included in this review have made steps to becoming more homogenous. However, future research should continue to ensure that the study of SC is uniform and important contributions to the knowledge base (i.e., the importance of control) are integrated into research as standard. Studies need to be conducted with more scientific rigour; namely power calculations should be conducted and appropriate sample sizes should be used. More research should be done on men, using clinical samples and considering age (Patel, Doku, & Tennakoon, 2003).

1.7.5 Overcoming the methodological shortcomings associated with self-complexity research.

Methodological inconsistencies have been blamed for the variable ability of studies to detect the stress buffering effects of SC. The key methodological shortcomings of SC will be outlined here, alongside suggestions from the literature of how they might be overcome.

Many theorists (e.g., Morgan & Janoff-Bulman, 1994; Rafaeli-Mor, Gotlib, & Revelle, 1999; Woolfolk, Novalany, Gara, Allen, & Polino, 1995) have argued

that SC is not a unitary construct; rather it comprises both positive and negative valenced self-knowledge. Research has demonstrated that negatively valenced self-knowledge, is associated with negative outcome and positively valenced self-knowledge is correlated positively with coping (e.g., Gara et al., 1993; Morgan & Janoff-Bulman, 1994; Woolfolk et al., 1995, 1999). Notably, Gara et al. (1993) found increased elaboration of negative self-structures to be related to greater depression, whereas increased elaboration of positive self-aspects was related to lower depression. Similarly, Woolfolk et al. (1995, 1999) found higher negative SC was related to depression severity. This is particularly important because Linville's (1985, 1987) original measure consisted of 33 traits, which disproportionately used ambivalent traits and more positive than negative traits (Koch & Shepperd, 2004; Rafaeli-Mor & Steinberg, 2002). Many theorists have tried to overcome this limitation by creating their own trait lists with varying combinations of valence. Of them Showers (1992) trait list has been most popular. Showers (1992) created a list of 40 unambiguous traits, composing of 20 positive and 20 negative traits. Research has shown that these Showers (1992) measure is comparable to that of Linville (1985), and suggested that where possible the Showers (1992) measure should be used (McConnell et al., 2005). Additionally, Showers and Larson (1999) argued for the addition of disorder specific trait words when SC is examined in relation to specific psychological disorders.

A majority of the research investigating SC in relation to psychological conditions utilised a university sample who were awarded course credit in return for participation (e.g., Parker, Boldero, & Bell, 2006; Ryan, LaGuardia, & Rawstorne, 2005; Showers, Zeigler-Hill, & Limke, 2006). Whilst this type of sample is accessible and minimises costs, it often reduces the heterogeneity of the participants

(Henrich, Heine, & Norenzayan, 2010). Consequently, the self-selecting nature of the participants reduces the external validity of the research (Bell & Wittkowski, 2009). It has been suggested that more research needs to be conducted using community and clinical samples.

Furthermore, most studies are conducted in an idiosyncratic manner and thus, do not build on previous findings. One of the most interesting findings over the past 10 years has been from McConnell et al. (2005). They did not find evidence for the stress buffering hypothesis of SC, but found that individuals who perceived their different self-aspects to be less under their control experienced poorer well-being. However, this study has yet to be replicated thus their findings are still rather tentative.

1.7.6 Summary.

The benefits of the SC theory are two-fold; first they enable a better understanding of the unique nature of the self-representation, and second, they attempt to explain individual differences in response to adversity. Unfortunately, the evidence base is complex and theorists have reported mixed results in their ability to detect the beneficial effects of SC. This has been attributed to the inconsistencies in the methodology used across studies. Future research must make efforts to overcome the methodological shortcomings outlined in the evidence base. Also, new findings about important mediating factors (i.e., control) need to be included as standard.

1.8 Self-complexity and trauma

1.8.1 Morgan and Janoff-Bulman.

Morgan and Janoff-Bulman (1994) looked at positive and negative SC and how they related to psychological adjustment following traumatic versus non-

traumatic life experiences. They recruited a sample of 242 students (59 male), mean age 19.98 years, who received extra credit for their participation. Subjects were classified into two groups – trauma and no trauma – based on their rating of experienced negative life events. In this study they used an adaptation of Linville's (1985, 1987) trait sorting task. They used 85 adjectives which incorporated the 33 traits used by Linville (1985).The aim of the adaptation was to ensure that more extreme positive and negative self-descriptions were represented which covered a wider range of attributes. They also altered the instructions of the task. Prior to seeing the adjectives, participants listed on a blank sheet of paper all aspects of themselves that they felt were meaningful (i.e., roles and identities). Participants were then given a copy of the adjective checklist for every subself they listed. They were asked to label each checklist with the name of the separate subself they provided. They then completed a checklist for each subself.

Psychological adjustment and coping was measured with the 'Global Severity Index of the Revised Symptom Checklist' (SCL-90-R; Derogatis, 1983) and the 'Constructive Thinking Inventory' (CTL; Epstein & Meier, 1989). Self Esteem was measured with the 'Self-Esteem Inventory' (RSI; Rosenberg, 1965). Most importantly Negative Life Events and Trauma was measured with a questionnaire constructed by Morgan and Janoff-Bulman (1994). It asked participants to list any traumatic events they had experienced, and asked about their experience of a range of typical negative life events. It then asked participants to rate how traumatic each life event they experienced was, and asked other questions to extract details about the trauma (i.e., what age they were at the time, and the extent to which it was traumatic). Participants completed the RSI, CTI, SCL-90, the negative events

questionnaire and demographics questions in small groups in a laboratory. Then they were throroughly debriefed.

The results indicated that positive SC was associated with better adjustment post-trauma in the trauma group (r = .10) and the no trauma group (r= .30). Whereas, negative SC was associated with poorer adjustment in both the trauma (r = .60) and the no trauma (r= .14) group. Overall, psychological adjustment for the trauma group was best predicted by the presence of many independent positive self-representations. However, there was no significant difference found between the trauma and no-trauma group in terms of levels of SC. Additionally, coping among people who had experienced a traumatic life event and had scored highly in SC was not associated with coping and adjustment, as assessed by measures of symptomotology and constructive thinking (Morgan & Janoff-Bulman, 1994). In this study adjumement was limited to looking at psychological adjustment and coping using the SCL-90 (Derogatis, 1983). Thus, it is still important to better understand the relationship between SC and other fundamental components of PTSD, such as cognitions and trauma-centered identity. This study illustrates the importance of positive SC in the aftermath of adversity.

1.8.2 Limitations.

Morgan and Janoff-Bulman (1994) were the first to demonstrate the role of SC in relation to trauma, and whilst their results are promising they require further validation. Particular strengths of their study include the use of positive and negative SC and their large sample size. However, more than 20 years have past since this paper was published and it has yet to be replicated. Furthermore, their methodological shortcomings provide ample opportunity for future resarch. Specifically, their use of a non-clinical student population with a low mean age

reduced heterogeneity of the sample and limits external validity (Ajetunmobi, 2001). Participants received extra credit for participation, which might have led to a selection bias (Bell & Wittkowski, 2009). Additionally, only 93% of their sample had experienced a trauma. Furthermore, the sample was primarily female, although this is a challenge for many researchers. Their adaptations of the traits in the SC measure was not based on any prior research and their trait list was excessive, with the 85 traits used making particpation in their study time consuming. They changed the instructions from the original task and did not provide any justification for this change. Finally, they failed to use a formal measure of trauma, but rather created their own non-validated measure, and did not include a reliable and valid measure of PTSD. Since the publication of this study much research has come out (as illustrated in section 1.7.5) which should be taken into consideration in future research. Notably, the publication by McConnell et al. (2005), who illustrated the importance of perceived self-aspect control in SC research. This is especially important to consider given the role perceived control plays in the development and maintenance of PTSD (e.g., Dunmore, Clark, & Ehlers, 1999)

1.8.3 Summary.

Morgan and Janoff-Bulman (1994) demonstrated the potential utility of the SC theory in relation to trauma. Whilst their results were promising, due to their methodological shortcomings they require replication. Furthermore research, looking at the relationship between SC and trauma, needs to integrate other more recent developments in SC knowledge. To be specific, perceived control should be considered due to its importance for SC (McConnell et al., 2005) and PTSD (e.g., Dunmore, Clark, & Ehlers, 1999). Finally, in addition to exploring posttraumatic

symptoms, researchers must examine other key factors pertinent to the relationship between self and PTSD symptoms, including appraisals and trauma-themed identity.

1.9 Control

1.9.1 Definition of control.

Control refers to the ability to favourably influence the outcome of an event (Rotter, 1954). Self-control is described as the ability to regulate one's thoughts, emotions and action in order to behave consistently with goals, requirements, rules, standards or the strong desire to do something else (Baumeister, Galliot, DeWall, & Oaten, 2006). Those with high self-control are more disciplined, reliable and hardworking. Control has been associated with academic achievement, self-esteem, self-efficacy, motivation, interpersonal skills, and positive emotion (e.g., Bandura, 1986, 1997; Deci & Ryan, 1985; Ryan & Deci, 2000). If something is considered controllable; it is more likely to be perceived as challenging as opposed to threatening (Lazarus & Folkman, 1984). Conversely, loss of control has been found to be negatively associated with symptoms of anxiety, depression, binge eating, stress, alcohol abuse and learned helplessness (e.g., Abramson, Seligman, & Teasdale, 1978; Averill, 1973; Beck, 1976; Jones & Barlow, 1990; Levine & Ursin, 1980; Tangney, Baumeister & Boone, 2004; Thompson, Sobolew-Shubin, Galbraith, Schwankovsky, & Cruzen, 1993).

Locus of control refers to the extent to which one feels they are able to exert their control (Rotter, 1954). It is usually conceptualised in terms of internal (under the control of the person) or external (under the control of external factors like the environment), which refers to the 'place' where the individual feels the control resides (Rotter, 1954). Strickland (1978) argues that internal locus of control, as compared to external locus of control, improves health as it is associated with

preventive behaviour, efforts to improve functioning, and greater resistance to psychological dysfunctions. In regards to mental health, people with internal locus of control suffer less from severe psychiatric disorders (Lefcourt, 1976), such as depression (Abramson, Seligman, & Teasdale, 1978) and PTSD (Solomon, Mikulincer, & Avitzur, 1988).

1.9.2 Control and self-complexity research and its limitations.

McConnell et al. (2005) examined the role of perceived self-aspect control in moderating the relationship between SC and subsequent outcomes. In this study control was defined as one's ability to exercise authority over elements of themselves. They argued that having many and diverse self-aspects would only be beneficial when those multiple selves support one's goals. As perceptions of control, autonomy, and stability about the self are regarded as important for successfully meeting life's challenges (e.g., Bandura, 1997; Sherman & McConnell, 1995), one should benefit by having diverse multiple selves that they have control over. However, if ones multiple selves have an external locus of control, are imposed upon the self by others, and are unstable in nature, their availability should not be beneficial as they will leave the person feeling overwhelmed.

In the first study, the role of perceived control as a moderator of the relationship between SC and well-being was examined. They recruited a sample of 127 undergraduate students, who participated in exchange for extra credit. Immediately after the completion of the SC task, participants were asked three questions pertaining to control. These included: how much control they felt they had over each self-aspect, the extent to which the self-aspect was self-initiated, and how stable the self-aspect was. All questions were rated on a seven point Likert scale, and an overall control score was calculated from the mean score of the three control-

related questions. Then participants completed the Rosenberg (1965) Self-Esteem Scale, the Cohen-Hoberman Inventory of Physical Symptoms (Cohen & Hoberman, 1983), the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), the College Students Life Events Scale (Levine & Ursin, 1980) and the Perceived Stress Scale (Cohen, Kamarack, & Mermelstein, 1983). Participants completed two experimental sessions, two weeks apart, with each session run on a computer workstation. During each session they completed all measures, except on the second occasion they did not complete the SC task or control ratings. This study found strong support for the self-aspect control hypothesis. That is, for those with less control over their self-aspects, greater SC was significantly associated with more physical symptoms and greater depression scores. This process was attenuated for those who reported greater control over their self-aspects. Thus, the current study replicated other findings in the literature showing that greater SC was related to poorer well-being (Rafaeli-Mor & Steinberg, 2002), but it demonstrated that perceptions of control over one's multiple selves moderated this effect.

In the second study, they evaluated whether self-aspect control was particular to one's control over multiple selves, or whether it reflected broader causal attributions and individual differences. They recruited 105 undergraduate students, who participated to fulfil a research requirement. Participants completed the SC task and the same control measure. Followed by, the Causal Uncertainty Scale (Weary & Edwards, 1994), the Expanded Attributional Style Questionnaire (Whitley, 1991), the Center for Epidemiologic Studies Depression Scale (Radloff, 1977) and they indicated whether they had experienced any of a list of 34 traumatic events. The same procedure was used as in the first study. The results revealed, that perceptions of control about one's self-aspects seem to provide the best account for when greater

SC lead to poorer well-being. Once again, greater SC uniquely predicted greater depression and greater perceived stress. This study found that as SC increased people experienced greater depression, more physical illness, greater perceived stress, more negative life events, and lower self-esteem. Furthermore, as SC increased, perceptions of self-aspect control decreased. Therefore, whilst greater SC was beneficial in buffering on-going life stressors, it was only beneficial if people perceived their multiple self-aspects to be under their control.

This study only looked at self-aspect control in relation to depression and has yet to be replicated looking at other mental health presentations, such as PTSD. Additionally, it utilised a non-clinical student population, who volunteered for extra credit or to fulfil a research requirement. Furthermore, this study did not consider SC in terms of its positive and negative components, thus using an overall score may have masked any stress buffering effect that was present (Koch & Shepperd, 2004; Rafaeli-Mor & Steinberg, 2002).

1.9.3 Role of Control in PTSD.

PTSD typically results from events which are out of one's perceived control. For instance, mental defeat (i.e., a state of cognitively surrendering one's identity and autonomy) has been found to impede recovery from PTSD by preventing individuals from seeing the trauma as a single, time-limited, past event which does not necessarily have global implications on the self or the future (Ehlers et al., 1998). Likewise, attempts to exert control over the traumatic situation has been found to be protective of the development of PTSD as it shields the individual from the full impact of the uncontrollable situation (Ehlers, Maerckers, & Boos, 2000). Jones and Barlow (1990) argue that absence of predictability and control are core features of traumatic events.

People with PTSD have been found to perceive themselves as alienated and permanently changed (Dunmore, Clark, & Ehlers, 1997; Ehlers et al., 1998, 2000). Severe trauma reduces people's appraisals of their inner resources and of their ability to influence traumatic situations; these appraisals are associated with diminished active coping, which in turn is correlated with poorer trauma outcomes (King et al., 1999). Perceptions of control and coping style are related. An active coping style enhances positive evaluations of control and increases the likelihood of successful coping. A study of American prisoners of war in Vietnam showed that passive coping was linked with an increased risk of mental health problems after captivity (King et al., 1999). Active coping involves mental planning during and after the event. Mental planning, involves considering/planning to minimise physical harm, psychological harm, or both to make the traumatic experience more bearable, or to exert influence on the perpertrator (Ehlers et al., 1998). It is deemed a protective factor that is incompatible with mental defeat (Ehlers et al., 1998).

1.9.4 Summary.

The role of control in SC has been one of the most interesting findings in the literature over the past 20 years. Recently, research has suggested that perceived control over ones' self-aspects may help us to understand why there has been such variability in the SC evidence base (McConnell et al., 2005). Furthermore, this section has explored the general importance of control in relation to trauma. Future research looking at the relationship between SC and trauma must be sure to include measures of control.

1.10 Rationale for the present study

Theoretical models of PTSD, and associated empirical research, illustrate the important role that the 'self' plays in the development and maintenance of PTSD. For example, Janoff-Bulman (1992) argued that trauma may result in discrepancies in how people schematically construct their view of themselves and the world. This may lead to reductions in ones self-concept (e.g., Abdollahi, Moradi, Hasani, & Jobson, 2012; Dalgleish & Power, 2004; van der Hart, Nijenhuis, & Steele, 2006), or the development that there has been a permanent and negative change in themself (e.g., Dunmore, Clark, & Ehlers, 1999). Such changes may leave people feeling as if their sense of self has been fragmented by the trauma (e.g., Dunmore, Clark, & Ehlers, 1999; Ehlers, Maercker, & Boos, 2000). This fragmentation emerges as poorer memory about facts concerning one's past and internal conflicts between parts of the self (e.g., Brewin, 2011; Brewin & Patel, 2010). Additionally, strong emotions about one's experiences often occur during the trauma, namely: shame, guilt and self-blame (e.g., Ehlers, Mayou, & Bryant, 1998). In some cases trauma may become central to a person's identity, distorting ones perception of past and present events (Berntsen & Rubin, 2007). Clinicians (Herman, 1992) and researchers (Pillemer, 1998) have proposed that traumatic events form turning points in people's construction of their own identity. However, the theoretical and empirical literature has failed to detail how the self is represented in cognition. Such a representation may enable clinicians and researchers to better consider the role of the self in PTSD.

The stress buffering effect of SC has attracted researchers to explore its usefulness for specific mental health conditions. However, there is currently only one study to indicate that SC might be applicable to trauma (Morgan & Janoff-Bulman, 1994). Therefore, further research with more scientific rigour is needed to validate these findings. Furthermore, there is evidence to suggest that incorporating

knowledge about perceived control into this research may be particularly beneficial (McConnell et al., 2005). Consequently, this study aims to identify whether perceived control mediates the relationship between SC and posttraumatic adjustment in a non-clinical sample.

The present study re-examines the SC model, incorporating recent theoretical and methodological critiques of its original formulation (e.g., Rafaeli-Mor, Gotlib, & Revelle, 1999). It attempts to replicate Morgan and Janoff-Bulmans (1994) research, with three key modifications. First, it will use the Showers (1992) modification of the 'trait sorting task', with the addition of trauma specific trait words, enabling the separate calculation of positive and negative SC (Showers & Larson, 1999). Second, given the role control has been found to play both in SC and PTSD, it will utilise the control measure used by McConnell et al. (2005). Third, the study will not only look at the relationship between SC and PTSD symptom severity, but also at the relationship between SC and changes in other areas of self that are known to be disrupted post-trauma, specifically self-appraisals (e.g., Brewin & Holmes, 2003) and trauma-themed identity (e.g., Berntsen & Rubin, 2007).

1.10.1 Research Questions.

The overall aim of the current study is to examine whether perceived control mediates the relationship between SC (positive and negative) and posttraumatic psychological adjustment. Specifically, three key questions will guide the research:

1. What is the relationship between SC and the following four aspects of posttraumatic psychological adjustment:
    a) PTSD symptoms
    b) Negative trauma-related cognitions
    c) Trauma-centered identity

d) Depression score

2. What is the relationship between perceived control and:

a) Self-complexity

b) The four measures of posttraumatic psychological adjustment

3. Does self-aspect control mediate the relationship between SC and posttraumatic symptomatology? As illustrated in Figure 2.

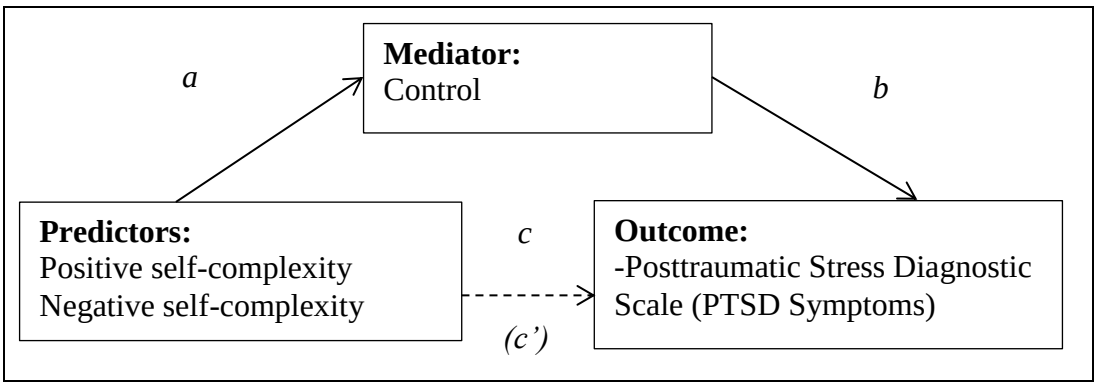

Figure 2. Diagram of proposed mediation model

2 – Method

2.1 Overview of Method

This chapter will start by detailing the design, participants and measures used in the current study. Then it will outline the ethical considerations made. Next the study procedure will be described. Finally, the plan for data analyses will be outlined.

2.2 Design

In order to investigate the relationship between the study variables (SC, posttraumatic psychological adjustment and control), this study used a single group cross-sectional quantitative design. This design is in line with previous prominent research in this area (e.g., Alatiq, Crane, Williams, & Goodwin, 2010), and was deemed appropriate due to the exploratory nature of the research questions at hand.

2.3 Participants

A non-clinical, international, adult sample of trauma survivors was recruited from the general population. All of the participants experienced a trauma which would meet PTSD Criterion A in the DSM-IV (APA, 1999). This sample was deemed appropriate for several reasons. First, up to 70% of healthy adults have experienced at least one traumatic event in their lifetime (Resnick, Falsetti, Kilpatrick, & Freedy, 1995). Second, trauma-centred identity has been found to be associated with PTSD in non-clinical populations (e.g., Robinaugh & McNally, 2011). Finally, most of the SC evidence-base utilised a student population. Thus, extending research to the general population held the advantage of extending the generalisability of the results. Participants were required to have a good command of English and be over 18 years old.

The sample size was calculated using G*Power (Erdfelder, Faul, & Buchner, 1996; Appendix A). Based on the effect size 0.30 (Rafaeli-Mor & Steinberg, 2002), a power of .80 and a significance level of .05, it was calculated that 84 participants would be needed. This sample size was comparable to previous research (e.g., McConnell et al., 2005). A medium effect size of 0.30 was selected as the meta-analysis by Rafaeli-Mor and Steinberg (2002) reported effect sizes of large variance, thus a conservative figure was selected.

In total 379 people accessed the study, of which 194 (51%) completed all aspects of it and were included in the data analyses. The 194 completers comprised 157 (80.9%) females and 37 (19.1%) males. In terms of age 39 participants (20.1%) were between 18-24 years old, 83 (42.8%) were between 25-34 years old, 34 (17.5%) were between 35-44 years old, 18 (9.3%) were between 45-54 years old, 14 (7.2%) were between 55-64 years old and 6 (3.1%) were between 65-74 years old. In terms of highest level of education 1 participant (0.5%) selected primary education, 11 (5.7%) secondary education, 46 (23.7%) college, 59 (30.4%) undergraduate degree, 58 (29.9%) master's degree and 19 (9.8%) PhD. In terms of ethnicity composition; 121 (62.4%) were white, 14 (7.2%) were black, 11 (5.7%) were Asian, 4 (2.1%) were Middle Eastern, 2 (1.6%) were of mixed heritage and 42 (21.6%) selected 'other'.

2.4 Measures

2.4.1 Self-complexity.

SC was measured using the Showers (1992) modification of the 'trait sorting task' (Appendix B). This is a free access measure, which has been validated for use online (e.g., Brown & McConnell, 2009). In this task participants were provided with the following instructions; "In this study we are interested in how you describe

yourself. We will be asking you to think of the different aspects of yourself that are meaningful to you (i.e., roles, relationships and activities). Then to list these aspects one at a time in the boxes below. Continue listing aspects until you feel that you have formed the important ones. When you feel that you are straining to form more aspects, it is probably a good time to stop". Participants listed their various self-aspects, and then on the next page were presented with each aspect they had listed in turn, with a randomly ordered list of 54 self-descriptive traits. Then they were instructed: "Please form groups of traits which describe the aspect of yourself listed at the top. Each group may contain as few or as many traits as you wish. You do not have to use every trait, only those that you feel are descriptive of you. Also, each trait may be used in more than one group; so you may keep reusing traits as many times as you like. For example, you may find that you want to use the trait 'happy' in several groups. Once you have finished selecting traits for each aspect, please proceed to the next page."

The trait list was composed of: 20 positive and 20 negative trait words obtained directly from Showers and widely used in SC research (e.g., Brown & McConnell, 2009; McConnell et al., 2005; Taylor, Morley, & Barton, 2007). Additionally, 14 trauma specific trait words were used. They were selected by piloting an extensive list of trauma traits (Appendix C) to a group of clinicians (N = 24) with knowledge of PTSD. The trauma traits were extracted from case studies of trauma survivors, the PTSD diagnostic criteria (DSM-IV; APA, 1999) and by conducting a literature search on PTSD and extracting the keywords used in describing trauma survivors. Clinicians were asked to rate each trait words on two 7-point scales. The first scale assessed how trauma-related the clinician thought the word to be (i.e., from 1 *not at all* to 7 *very related*). The second scale measured the

valence of each word (i.e., from 1 *negative* to 7 *positive*). This approach followed that done previously in research to select trait words (e.g., Showers & Larson, 1999). Then the 14 most trauma-related traits (7 positive and 7 negative), with a clearly positive (a score of 6 or 7) or negative valence (a score of 1 or 2) were selected and added to the existing list from Showers. Table 3 illustrates the final list of trait words used in this study.

Table 3

Complete list of traits used in this study

	Positive trait words	Negative trait words
Showers (1992) trait words		
1	Successful	Disagreeing
2	Giving	Hopeless
3	Capable	Lazy
4	Confident	Self-centred
5	Comfortable	Unloved
6	Independent	Not the "real me"
7	Needed	Immature
8	Communicative	Weary
9	Mature	Uncomfortable
10	Organised	Sad and blue
11	Intelligent	Incompetent
12	Loveable	Insecure
13	Fun & Entertaining	Worthless
14	Interested	Inferior
15	Outgoing	Irritable
16	Energetic	Like a failure
17	Hardworking	Isolated
18	Happy	Indecisive
19	Friendly	Disorganised
20	Optimistic	Tense
Trauma specific trait words		
1	Wise	Damaged
2	Hopeful	Fearful
3	Adaptive	Vulnerable
4	Secure	Hurt
5	Strong	Victim
6	Safe	Suffering
7	Resilient	Traumatised

The SC measure has been found to have good internal validity and test-retest reliability (r=.71) (Showers, Abramson, & Hogan, 1998). To calculate SC, the *H*-statistic was used to capture trait redundancy in a binary set (Attneave, 1959). For this the following formula was utilised, $H = \log_2 n - (\sum n_i \log_2 n_i) /n$, where 'n' is the total number of traits available to the participant and 'n_i' is the number of traits that occur within each particular group combination (Appendix D: Worked example of H statistic). A computer programme was created using C++ to conduct the above calculation. Separate complexity calculations were performed for the positive and negative adjectives, as done in previous research (e.g., Morgan & Bulman, 1994; Showers, 1992; Showers & Larson, 1999). Positive SC was equivalent to the redundancy of positive traits used across all self-aspects. Negative SC was equivalent to the redundancy of negative traits used across all self-aspects. Additionally, separate complexity calculations were performed for the different trait lists (i.e., overall traits, non-trauma traits only, trauma traits only), resulting in six different SC scores. To obtain a high SC score, participants had to use more self-aspects when describing themselves and have low trait redundancy across their different self-aspects (i.e., they used a range of different traits to describe the different aspects of themselves). Conversely, to obtain a low SC score participants had to use less self-aspects in describing themselves and have high trait redundancy across their different self-aspects (i.e., they repeatedly used the same traits when describing the different aspects of themselves). Table 4 explains the breakdown and the abbreviations which will be used during the remainder of this thesis.

Table 4

Self-Complexity Breakdown and Abbreviations

Abbreviation	Explanation
SCpos	Self-complexity positive: The overall positive self-complexity score, calculated using the 27 positive words
SCneg	Self-complexity negative: The overall negative self-complexity score, calculated using the 27 negative words
NTSCpos	Non-trauma self-complexity positive: The positive non-trauma word self-complexity score, calculated using the 20 positive non-trauma words
NTSCneg	Non-trauma self-complexity negative: The negative non-trauma word self-complexity score, calculated using the 20 negative non-trauma words
TSCpos	Trauma self-complexity positive: The positive trauma word self-complexity, calculated using the 7 positive trauma words
TSCneg	Trauma self-complexity negative: The negative trauma word self-complexity, calculated using the 7 negative trauma words

2.4.2 Control.

To measure control McConnell et al.'s (2005) control ratings were used. Participants re-visited each self-aspect they had provided in the SC task and were asked to firstly rate how much control they felt they had over each self-aspect, using a scale ranging from 1 (*I have no control over it at all*) to 7 (*I control it completely*). Next, they were asked to report the extent to which the self-aspect was self-initiated on a scale ranging from 1 (*started solely by others*) to 7 (*started solely by me*). Finally, they were asked to assess how stable the self-aspect was on a scale ranging from 1 (*very unstable*) to 7 (*very stable*). As in McConnell et al. (2005) from these questions, an overall control score was computed for each participant by calculating the mean of the three control related questions. In previous research this measure

generated good reliability across participants (α = 0.64; McConnell et al., 2005), the current study also had excellent internal consistency (α = 0.98).

2.4.3 Posttraumatic Psychological Adjustment.

2.4.3.1 Posttraumatic Stress Diagnostic Scale. PTSD symptomatology was measured using the Posttraumatic Stress Diagnostic Scale (PDS; Foa, et al., 1997; Appendix E), a 49-item self-report measure which is widely used in research and clinical settings. This measure was developed to assist with the diagnosis of PTSD. The PDS measures each of the PTSD diagnostic criteria (A-F) outlined in the DSM-IV (APA, 1994). The PDS contains four parts. The first two parts ask about trauma history and screen for the DSM-IV (APA, 1994) PTSD stressor (criteria A). In part three, respondents rated the severity and duration of 17 symptoms that correspond with the core PTSD diagnostic symptoms (criteria B through E) from 0 (*not at all* or *only one time*) to 3 (*5 or more times a week / almost always*). A symptom is considered to be present if it is scored 1 or higher. Part four identified the extent to which respondents' symptoms have affected their level of functioning over the past month (criteria F). The PDS provides an overall severity score (ranging 0-51) of the frequency of the 17 PTSD symptoms. Scores on the PDS can be used to obtain a preliminary DSM-IV PTSD diagnosis, a symptom count, a symptom severity rating, and an indication of functional impairment (Norris & Hamblen, 2004).

Norms for the PDS have been derived from respondents with PTSD and from at-risk populations, who have experienced an array of distressing events (Foa, Cashman, Jaycox, & Perry, 1997). The scale has excellent psychometric properties. Foa et al. (1997) reported overall internal consistency alpha coefficient of .92, the current study also had excellent internal consistency (α = 0.98). Test-retest reliability of PTSD diagnosis had 87% agreement (κ = .74). As for convergent validity,

diagnoses based on the PDS were in 82% agreement (κ = .65) with those based on the PTSD module of the Structured Clinical Interview for DSM-III-R (Spitzer, Williams, Gibbon, & First, 1990). The PDS also correlated .78 with posttraumatic symptoms as measured with the Impact of Events Scale-Revised (Weiss & Marmar, 1997) and .79 with depression symptoms measured using the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961).

2.4.3.2 The Posttraumatic Cognitions Inventory. The Posttraumatic Cognitions Inventory (PTCI; Foa, et al., 1999; Appendix F) was used to assess negative trauma-related thoughts and beliefs. This self-report measure helps to tease out important interpersonal meaning derived from the trauma. It has 33 items which were rated on Likert-scales ranging from 1 (*totally disagree*) to 7 (*totally agree*). These items comprise three subscales which represent negative cognitions about the self (21 items), negative cognitions about the world (7 items) and self-blame (5 items). The subscales show a high degree of intercorrelation (*r*s = 0.57 - 0.75). All three PTCI scales, as well as the total score, have been found to correlate substantially with PTSD severity, depression, and general anxiety (Foa, Ehlers, Clark, Tolin, & Orsillo, 1999). Internal consistency was strong for all three subscales (Negative Cognitions About the Self, α = 0.97; Negative Cognitions About the World, α = 0.88; Self-Blame, α = 0.86). The overall internal consistency in this study was high α = 0.97, and equivalent to what has been reported in previous research (Foa, et al., 1999). Convergent validity appears promising, as does the ability of the PTCI to differentiate individuals with and without PTSD (sensitivity = 0.78, specificity = 0.93; Foa et al., 1999).

2.4.3.3 The Centrality of Events Scale. The Centrality of Events Scale (CES; Berntsen & Rubin, 2006; Appendix G), is a self-report measure of how central a distressing event was to a person's identity. Participants were asked to think back upon the most stressful and traumatic event in their lives and answer the questions in an honest manner. The CES has 20 items, and each item is measured on a 5-point Likert-scale from 1 (*totally disagree*) to 5 (*totally agree*). The final scale score is the sum of responses, ranging from 20 to 100. The CES has been found to have high internal consistency ($\alpha = 0.94$) and the results of factor analysis have suggested that a single construct underlies the CES (Berntsen & Rubin, 2006). The internal consistency for the CES in this study was high ($\alpha = 0.97$). The scale correlates .38 with the severity of PTSD symptoms as measured with the PTSD checklist (Blanchard, Jones-Alexander, Buckley, & Foneris, 1996) and correlates .23 with depression symptoms measured with the BDI (Beck et al., 1961; Berntsen & Rubin, 2006).

2.4.4 Depressive symptoms.

As depressive symptoms were included in a majority of the analyses alongside the three measures of posttraumatic psychological adjustment, for ease of reporting it has been referred to as the fourth measure of posttraumatic psychological adjustment during this thesis. Due to the high co-morbidity between PTSD and depression (Breslau, 2002), it is good practice to measure depression as standard in PTSD research. To do this the widely used Centre for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977; Appendix H) was employed. The CES-D consists of 20 items which were self-rated on 4-point scales based on the amount of time in the previous week in which symptoms have been experienced by the individual (*<1 day* to *5–7 days*). Scores range from 0 to 60. Standard cut-off scores

≥16 identify individuals at risk of developing clinical depression, with a sensitivity of .95 and a specificity of .29 (Radloff, 1977) in the general population. The CES-D has good internal consistency (α = 0.87 in college students and between α = 0.80 to 0.90 in the general population; Devins et al., 1988; Radloff, 1977) and test-retest reliability (r = 0.65) (Radloff, 1991). The CES-D had good internal consistency in this sample α = 0.94. It has also been found to have excellent concurrent validity correlating 0.84 with another self-report measure of depression (SCL-90-R; Derogatis, 1983). The sensitivity and specificity of the CES-D has been found to compare favourably with the BDI (Beck et al., 1961).

2.4.5 Demographics.

Finally, a demographic form was created to collect data about participant's age, gender, ethnicity and educational history.

2.5 Ethical considerations

This study obtained ethical clearance from the UEA Faculty of Medicine and Health Sciences Research Ethics Committee (Appendix I).

2.5.1 Informed Consent and Withdrawal.

This study adhered to the British Psychological Society (BPS) guidelines (2009, 2013) on conducting research ethically and conducting internet mediated research. The first page of the online study comprised an information sheet (Appendix J), which detailed the true nature of the study and the type of questions to follow. All participants had access to this page prior to taking part in the study and were able to review it for as long as necessary. The information page notified participants that the research was voluntary, participants could change their mind about participating at any time before or during the study, and that they had the right

to withdraw at any stage of the study without consequence or giving a reason (BPS, 2009). It also notified participants that the study would be written up and potentially published as a journal article. Those who were willing to take part continued onto the consent page, where they were asked to explicitly state their consent by indicating whether or not they agreed to six consent statements (Appendix K). The consent element of the study was designed so that only participants who gave consent were able to access the study.

2.5.2 Confidentiality.

During the study no identifiable questions were asked in order to preserve anonymity. Participants whom wished to enter the prize draw or to receive feedback about the study were asked to provide their contact details on a separate online survey which was not linked in any way to their questionnaire responses.

2.5.3 Data storage.

The Data Protection Act (1998) stipulates that confidential data should be stored securely. The design of this study enabled no identifiable data to be collected. Additionally, it was not necessary for any hardcopies of the data to be printed. All data was collected online using the Survey Monkey 'Gold Package', which offered enhanced security features. To access Survey Monkey a username and password was needed, both of which were only known by the main researcher. Once the study was completed data was extracted from the online survey straight into SPSS. All study data was then stored on a UEA encrypted desktop computer and backups were kept on an encrypted memory stick which was stored in the office of Dr Laura Jobson at the University of East Anglia. The data was only accessible to the research team. For the participants who wished to enter the draw to win vouchers for their participation, or wished to find out more information about the study results were asked to provide

identifiable contact details on a separate online form. The contact information was destroyed following the prize draw and provision of feedback about the study. The Data Protection Act (1998) specifies that data should not be kept for longer than necessary. Therefore, data will be kept for a period of 10 years in order to re-appraise the data for further research, and/or to provide the original data for inspection if queries are raised regarding the integrity of the results. After this time the data will be deleted and if any hardcopies that have been made they will be shredded and disposed of in confidential waste.

2.5.4 Distress.

It was deemed unlikely for any harm to come to participants as a result of their participation in this study. However, as the study assessed potentially distressing and sensitive material, the impact of this on participants was considered. Research has shown that studies which ask questions about trauma are safe and do not put participants at risk of re-traumatisation (Cromer, Freyd, Binder, DePrince, & Becker-Blease, 2006). This finding has been validated in community samples (e.g., DePrince & Freyd, 2004). Participants have described their research experiences as positive, as having provided personal gain (Newman, Walker, & Gelfand, 1999) and have rated the benefits as outweighing the costs (DePrince & Freyd, 2004). All measures used in the study have been used previously in a community samples (e.g., Bochner, 1994) and some are used regularly in clinical practice.

Furthermore, the researchers endeavoured to reduce and respond to distress in the following ways. First, participants were informed at each stage of the study (i.e., study advertisements, information sheet and start of study questionnaires) that the study asked about distressing events. Second, the information sheet clearly stated that there was no requirement to complete the measures and that participant could

discontinue at any point without any consequences. Third, the information sheets, contained the researchers' contact details together with sources of help and support (GP and the Samaritans helpline), for participants to contact if they felt distressed. However, no participants contacted the researchers at any stage to say that they found participating in the study distressing.

2.6 Procedure

Members of the public were recruited through advertisements (Appendix L) left in community gathering places (i.e., sports centre, library, town hall, community centres, shop windows, universities), emails sent to the gate holders of community groups (i.e., trauma support groups, mental health charities, community projects) and through word of mouth. As this study was administered online, it was advertised in both UK and international trauma online support forums enabling the recruitment of an international sample. Additionally, university students and staff were recruited through a media release at the UEA and emails sent to members of the Norwich Medical School. All advertisements contained a link to the online version of the study, and a contact email address for the study for participants who wished to find out more.

This study was administered online, using the website www.surveymonkey.com. On the first page of the online study, participants were presented with the information sheet (Information sheets; Appendix J) detailing what they were required to do during the study, with the researchers full contact details should they wish to find out more. Participants were told that the study aimed to explore the relationship between their life events and how they see themselves. Those who decided to proceed were presented with a page asking them to provide

informed consent (Informed consent forms; Appendix K) for their participation (Elmes, Kantowitz, & Roediger, 2006).

First, the brief demographic questions were asked. Next the SC task (Showers, 1992) was presented, then participants were asked to complete control ratings for each of the self-aspects they produced (McConnell et al., 2005). They then completed the four measures of posttraumatic psychological adjustment: PDS (Foa, et al., 1997), PTCI (Foa, et al., 1999), CES (Berntsen & Rubin, 2006) and CES-D (Radloff, 1977). Then, participants were thanked and fully debriefed (Debriefing form, Appendix M). Finally, participants were given the opportunity to request generic results when they become available and to enter a draw to win one of ten £10 Amazon vouchers for their participation.

2.7 Plan of Analysis

Descriptive statistics were initially carried out using SPSS Version 22, to analyse the demographic composition of the sample and to run normality tests on the data obtained from the study. In order to address the research questions listed below the following statistical analysis were conducted using the same statistical programme:

1. What is the relationship between SC and the four measures of posttraumatic psychological adjustment?

Four correlation analyses were conducted to establish the relationship between each of the six SC scores (i.e., overall positive SC, overall negative SC, non-trauma positive SC, non-trauma negative SC, trauma positive SC, trauma negative SC) and posttraumatic psychological adjustment (indexed by PDS, PTCI, CES & CES-D scores).

2. What is the relationship between control and:

a. the six self-complexity scores?

Six correlation analyses were used to investigate the relationship between control and each of the six self-complexity scores.

b. the measures of posttraumatic psychological adjustment?

Four correlation analyses were used to consider the relationship between control and the four measures of posttraumatic psychological adjustment (indexed by PDS, PTCI, CES & CES-D scores).

3. Does self-aspect control mediate the relationship between the six SC scores and posttraumatic symptomatology?

Six mediation analyses (Hayes & Preacher, 2013) were used to examine whether the relationship between the six SC scores and PTSD symptoms (indexed by PDS) was mediated by control. These analyses were conducted using the bootstrapping procedures recommended and operationalised in an SPSS macro by Hayes and Preacher (2013).

3-Results

3.1 Overview of Results

This chapter presents the results from the statistical analyses conducted on the data collected for this thesis. All of the data analyses were conducted using Statistical Package for Social Sciences (SPSS Inc., Chicago, Illinois, USA) for Windows (Version 22). The chapter begins by examining whether there were any differences in demographic data between those who completed the study and those who dropped out. Next, normality data for the sample was addressed and a description of each measure was presented. Finally, the results pertaining to the three research questions are presented. In each analysis three different positive and negative SC scores were investigated in turn; overall SC, non-trauma word SC and trauma-word SC. Finally, a summary of the main findings are presented.

3.2 Descriptive data

3.2.1 Preliminary data screening.

Prior to commencing statistical analysis, the data was screened for missing data and data integrity. In total 379 people accessed the study, of which 194 (51%) completed all aspects of it. If data were missing at random and the amount of missing data was less than 5% (n = 69), the missing item was replaced by the mean substitution (Tabachnick & Fidell, 2007). In cases where the missing data was greater than 5% the case was excluded from the data analyses (n = 185). Of the 185 non-completers, 137 (74%) dropped out at the end of the demographics phase, a further 38 (21%) dropped out before or during the PDS, and the remaining 10 (5%) did not give sufficient answers on one or more of their scales consequently scale totals could not be calculated.

3.2.2 Comparison of data for completers versus non-completers.

As such a high number of participants dropped out of the study (n=185), statistical analyses were conducted to compare the responses of those who completed the study with those who dropped out. Comparisons were only made for demographic data as most non-completers did not have sufficient data for other comparisons to be made. Chi-squared tests and Fishers exact tests were used to examine whether there were differences in age, gender, education and ethnicity. The chi-square test of independence requires at least 80% of cells to have expected frequencies of five or more, this assumption was violated for age and ethnicity so the Fishers exact test (FET) was used. It was found that completers and non-completers did not differ significantly in terms of age (X^2 (6, n = 379) = 6.72, p = 0.33, FET), gender (X^2 (1, n = 379) = 3.39, p = 0.07), education (X^2 (5, n = 379) = 3.37, p = 0.64) or ethnicity (X^2 (6, n = 379) = 8.11, p = 0.21, FET). All subsequent analyses in this chapter were conducted on completers only.

3.2.3 Examining the normality and characteristics of the data.

Histograms and boxplots were used to examine the data for outliers. Eleven cases (6%) had extreme scores on the 'self-complexity' measure (Linville, 1985, 1987), and four cases (2%) had extreme scores on the 'control' measure (McConnell et al., 2005). This was resolved using Winsorising (Tukey, 1962), whereby the data points at the end of the tails of the distribution were given the next value within the distribution that were not suspected to be outliers. Conducting these analyses was thought to enhance the likelihood of capturing the effects in the data analyses.

Once the outliers had been addressed normality tests (Table 5) were conducted to see whether the data was normally distributed. The Shapiro-Wilik test, reported in Table 5, illustrates that the majority of the outcome measures (PDS, PTCI, CES, CES-D, SCpos, SCneg, NTSCpos, NTSCneg, TSCpos & TSCneg) were

not normally distributed (Ghasemi & Zahediasl, 2012). Transformations were unable to resolve the skew so non-parametric statistics were utilised for the duration of the data analyses.

Table 5

Descriptive data for study variables and tests of normality

	M	*SD*	*Range*	*Skewness*	*SE of Skewness*	*S.W*
Posttraumatic psychological adjustment						
PDS	16.23	13.45	0 – 51	0.70	0.18	.93
PTCI	95.98	46.20	33 – 211	0.53	0.18	.95
CES	62.08	23.12	20 – 100	-0.31	0.18	.95
CES-D	21.85	14.38	0 – 51	0.52	0.18	.95
Control	4.88	0.81	2.90 - 6.88	-0.18	0.18	.99*
Self-complexity						
SCpos	3.58	1.01	0.90 - 4.75	-0.91	0.18	.91
SCneg	1.91	1.18	0.00 - 4.75	0.20	0.18	.97
NTSCpos	3.35	0.92	1.00 - 4.32	-0.99	0.18	.88
NTSCneg	1.80	1.11	0.00 - 4.32	0.19	0.18	.97
TSCpos	2.30	0.54	1.14 - 2.81	-0.90	0.18	.84
TSCneg	1.25	0.86	0.00 - 2.81	-0.02	0.18	.93

Note. *. This is a lower bound of the true significance, p>0.05; M= Mean. SD= Standard deviation; SE= Standard error. SW=Shapiro-Wilk; PDS=Posttraumatic Stress Diagnostic Scale; PTCI=The Posttraumatic Cognitions Inventory; CES= The Centrality of Events Scale; CES-D=The Centre for Epidemiologic Studies Depression Scale; SCpos=Self-complexity positive; SCneg=Self-complexity negative; NTSCpos=Non-trauma self-complexity positive; NTSCneg=Non-trauma self-complexity negative; TSCpos=Trauma self-complexity positive; TSCneg=Trauma self-complexity negative.

3.2.4 A description of posttraumatic symptoms.

Fifty-one percent (*n*=99) of the sample met DSM-IV criteria for PTSD (APA, 1999). Using the PDS cut-offs (Foa, 1995), 13.4% of the sample met criteria for no PTSD, 27.8% of the sample met criteria for mild PTSD, 24.7% of the sample met criteria for moderate PTSD, 24.2% of the sample met criteria for moderate-severe PTSD and 9.8% of the sample met criteria for severe PTSD. Table 6 illustrates the distribution of trauma types experienced and those considered most traumatic by this sample.

Table 6

Trauma types experienced and considered most traumatic by the study sample

	Trauma type	Experienced	Most traumatic
1	Serious accident, fire, or explosion (for example, an industrial, farm, car, plane, or boating accident)	77 (39.7%)	34 (17.5%)
2	Natural disaster	25 (12.9%)	3 (1.5%)
3	Non-sexual assault by a family member of someone you know	47 (24.2%)	19 (9.8%)
4	Non-sexual assault by a stranger	58 (29.9%)	17 (8.8%)
5	Sexual assault by a family member or someone you know	45 (23.2%)	19 (9.8%)
6	Sexual assault by a stranger	33 (17%)	11 (5.7%)
7	Military combat or war zone	12 (8.2%)	8 (4.1%)
8	Sexual contact when you were younger than 18 with someone who was 5 or more years older than you	44 (22.7%)	9 (4.6%)
9	Imprisonment	6 (3.1%)	1 (0.5%)
10	Torture	7 (3.6%)	4 (2.1%)
11	Life threatening illness	45 (23.2%)	29 (14.9%)
12	Other (e.g., witnessing suicide, witnessing murder, emotional abuse, being awake during a tooth extraction, termination of pregnancy from abusive relationship)	89 (45.9%)	40 (20.6%)

In response to time since trauma, in this sample three (1.5%) people reported the trauma occurring less than one month ago, two (1.0%) participants reported it happening one to three months ago, seven (3.6%) participants reported it happening three to six months ago, 48 (24.7%) participants reported it happening six months to three years ago, 28 (14.4%) participants reported it happening three to five years ago,

105 (54.1%) participants reported it happening more than five years ago and 1 person (0.5%) did not answer the question.

3.2.5 A description of self-complexity.

Participants used a range of positive and negative words in describing their self-aspects. On average participants used nine self-aspects (*SD* = 4.34; range = 2-20) to describe themselves. Table 7 provides an example of four different participants' self-aspects.

Table 7

Examples of four different participants' self-aspects

Participant 1	Participant 2	Participant 3	Participant 4
Confusing	Person	Sad	Family relationships
Nice	Mother	Alone	Partner relationships
Complicated	Daughter	Useless	Friend relationships
Loyal	Artist	Inferior	Career and education
Funny	Partner	Insecure	Health and fitness
	Citizen	Unloved	Travel
	Child		
	Writer		
	Baker		

3.3 Research questions

3.3.1 Research question 1: What is the relationship between overall self-complexity and the measures of post traumatic psychological adjustment?

First, four Spearman's *rho* correlational analyses were conducted to examine the relationship between overall SC and the four measures of posttraumatic psychological adjustment (PDS, PTCI, CES & CES-D). This was done separately for overall positive SC and overall negative SC; the results of the correlation analyses are presented in Table 8.

Table 8

Bivariate Correlations (Spearman's rho) between overall self-complexity and the measures of posttraumatic psychological adjustment

	PDS	PTCI	CES	CES-D
SCpos	-.08	-.08	-.01	-.25**
SCneg	.37**	.42**	.40**	.35**

Note. * Significant at the p <0.0125 (two-tailed Bonferroni corrected level); **significant at p <.001 level (two-tailed); df = 192; PDS=Posttraumatic Stress Diagnostic Scale; PTCI=The Posttraumatic Cognitions Inventory; CES= The Centrality of Events Scale; CES-D=The Centre for Epidemiologic Studies Depression Scale.

As four correlations were conducted, Bonferroni corrections (p < .0125) were made to minimise the chance of obtaining a Type 1 error. As Table 8 shows, there was a significant negative correlation between overall positive SC and CES-D; participants who scored higher in overall positive SC reported lower levels of depression. There was a significant positive correlation between overall negative SC and the four measures of posttraumatic psychological adjustment (PDS, PTCI, CES & CES-D). Higher levels of overall negative SC were significantly associated with higher levels of PTSD symptomatology, negative trauma- related cognitions, trauma-themed identity and depression symptoms.

3.3.2 Research question 1: What is the relationship between non-trauma self-complexity and the measures of post traumatic psychological adjustment?

Four Spearman's *rho* correlational analyses were conducted to examine the relationship between non-trauma word SC and the four measures of posttraumatic psychological adjustment for both for positive and negative non-trauma words. The results of the correlation analyses are presented in Table 9.

Table 9

Bivariate Correlations (Spearman's rho) between non-trauma word self-complexity and the measures of posttraumatic psychological adjustment

	PDS	PTCI	CES	CES-D
NTSCpos	-.06	-.07	-.01	-.23**
NTSCneg	.34**	.40**	.38**	.34**

Note. * Significant at the p <0.0125 (two-tailed Bonferroni corrected level); **significant at p <.001 level (two-tailed); df = 192. PDS=Posttraumatic Stress Diagnostic Scale; PTCI=The Posttraumatic Cognitions Inventory; CES= The Centrality of Events Scale; CES-D=The Centre for Epidemiologic Studies Depression Scale.

As four different correlations were conducted, Bonferroni corrections were again used. As shown in Table 9, there was a significant negative correlation between non-trauma word SC and CES-D; participants who scored higher in positive non-trauma word SC reported lower levels of depression. There were significant positive correlations between non-trauma word SC and the four measures of posttraumatic psychological adjustment (PDS, PTCI, CES & CES-D). Higher levels of negative non-trauma word SC were significantly associated with higher levels of PTSD symptomatology, negative trauma-related cognitions, trauma-themed identity and depression symptoms.

3.3.3 Research question 1: What is the relationship between trauma self-complexity and the measures of post traumatic psychological adjustment?

Four correlational analyses (Spearman's *rho*) were conducted to examine the relationship between trauma word SC and the four measures of posttraumatic psychological adjustment for both positive and negative trauma words. The results of the correlation analyses are presented in Table 10.

Table 10

Bivariate Correlations (Spearman's rho) between trauma word self-complexity and the measures of posttraumatic psychological adjustment

	PDS	PTCI	CES	CES-D
TSCpos	-.07	-.04	-.03	-.22*
TSCneg	.44**	.44**	.45**	.36**

Note. * Significant at the p <0.0125 (two-tailed Bonferroni corrected level); **significant at p <.001 level (two-tailed); df = 192; PDS=Posttraumatic Stress Diagnostic Scale; PTCI=The Posttraumatic Cognitions Inventory; CES= The Centrality of Events Scale; CES-D=The Centre for Epidemiologic Studies Depression Scale.

Again as four different correlations were conducted, Bonferroni corrections were made. Table 10 shows that there was a significant negative relationship between positive trauma word SC and CES-D. There were also significant positive correlations between trauma word SC and the measures of posttraumatic psychological adjustment; higher levels of negative trauma word SC were significantly associated with higher levels of PTSD symptomatology, negative trauma-related cognitions, trauma-themed identity and depression symptoms.

In summary, the pattern of correlations is the same, regardless of whether you look at non-trauma traits, trauma traits or both together.

3.3.4 Research question 2A: What is the relationship between control and self-complexity?

The results of the correlations are shown in Table 11.

Table 11

Bivariate Correlations (Spearman's rho) between control and self-complexity

		Control	
		r_s	*P*
Overall SC	Positive	.15	0.04
	Negative	-.38	<0.001*
Non-trauma SC	Positive	.13	0.06
	Negative	-.37	<0.001*
Trauma SC	Positive	.16	0.03
	Negative	-.36	<0.001*

Note. *. Significant at the <0.008 (two-tailed Bonferroni corrected level); *df = 192;* SC= Self-complexity.

As six different correlations were conducted for each SC type (positive and negative), Bonferroni corrections ($p < .008$) were made to minimise the chance of obtaining a Type 1 error. Control was significantly negatively correlated with all variants of negative SC. Thus, individuals who scored higher on the control rating reported lower levels of negative SC (overall, non-trauma and trauma only).

3.3.5 Research question 2B: What is the relationship between control and the measures of posttraumatic psychological adjustment?

The results of the correlation analyses are shown in Table 12.

Table 12

Bivariate Correlations (Spearman's rho) between control and the measures of posttraumatic psychological adjustment

	Control	
	r_s	*P*
PDS	-.25	<0.001*
PTCI	-.40	<0.001*
CES	-.22	<0.005*
CES-D	-.36	<0.001*

Note. *. Significant at the <0.0125 (two-tailed Bonferroni corrected level); *df = 192;* PDS=Posttraumatic Stress Diagnostic Scale; PTCI=The Posttraumatic Cognitions Inventory; CES= The Centrality of Events Scale; CES-D=The Centre for Epidemiologic Studies Depression Scale.

As four different correlations were conducted, Bonferroni corrections ($p < .0125$) were made to minimise the chance of obtaining a Type 1 error. Control was significantly correlated with all measures of posttraumatic psychological adjustment. As control scores increased, participants reported less posttraumatic symptoms, less negative trauma-related cognitions, less trauma-themed identity and less depression symptoms.

3.3.6 Research question 3: Does self-aspect control mediate the relationship between self-complexity and PTSD symptoms?

Analyses were conducted using the PROCESS (Hayes & Preacher, 2013) add-on for SPSS which was downloaded from http://www.afhayes.com. Analysis with the PROCESS macro facilitated the use of non-parametric bootstrapping (Fritz & Mackinnon, 2007); bias-corrected 95% confidence intervals based on 10,000 bootstrapped samples are reported for the indirect effects. In this method, if these confidence intervals do not include zero this indicates that the mediation is significant (Preacher & Hayes, 2004; Shrout & Bolger, 2002). The PROCESS macro also calculates effect sizes for mediation analysis, and the indirect effect of the predictor on the outcome (Hayes & Preacher, 2013) which are reported here.

3.3.6.1 Overall self-complexity. The results from the mediation analyses associated with overall positive and negative complexity are illustrated in Table 13.

In terms of positive overall SC, the unstandardised indirect effect was -0.73, and the 95% bias-corrected confidence interval around the bootstrapped mean for the indirect effect were LL = -1.74, UL = -0.14. Given that these confidence intervals do not include zero, this indicates that the indirect effect is statistically significant at $p < .05$ (Preacher & Hayes, 2004; Shrout & Bolger, 2002), which suggests that the relationship between overall positive SC and PDS outcome is mediated by control.

In terms of negative overall SC, the unstandardised indirect effect was 0.87, and the 95% bias-corrected confidence interval around the bootstrapped mean for the indirect effect were LL = 0.18, UL = 1.73, which suggests that the relationship between overall negative SC and PDS outcome is mediated by control.

Table 13

Unstandardised and Standardised Coefficients and Statistical Significance for Mediation Analysis with overall self-complexity as a Predictor, Control as a Mediator and Posttraumatic Stress Diagnostic Scale as an outcome variable

	β	*SE*	*B*	*T*	*P*	LLCI	ULCI
SCpos as a Predictor PDS as an outcome variable							
Path *a*	0.25	0.06	0.16	2.71	0.006	0.05	0.27
Path *b*	0.13	1.17	-4.61	-3.95	<0.001	-6.90	-2.31
Path *c*	-0.01	0.95	-1.95	-2.06	0.041	-3.82	-0.09
Path *c'*	<-0.01	0.93	-1.22	-1.32	0.190	-3.06	0.61
SCneg as a Predictor and PDS as an outcome variable							
Path *a*	-0.58	0.05	-0.27	-6.00	<0.001	5.20	5.60
Path *b*	-0.01	1.21	-3.18	-2.64	0.009	-5.57	-0.79
Path *c*	0.03	0.77	3.85	4.98	<0.001	2.33	5.38
Path *c'*	0.02	0.83	2.99	3.60	<0.001	1.35	4.62

Note. LLCI = Lower Limit Confidence Interval; ULCI = Upper Limit Confidence Interval; SCpos = Self-complexity positive; SCneg = Self-complexity negative; PDS=Posttraumatic Stress Diagnostic Scale.

3.3.6.2 Non-trauma word self-complexity. The results from these mediation analyses are illustrated in Table 14.

Table 14

Unstandardised and Standardised Coefficients and Statistical Significance for Mediation Analysis with non-trauma word self-complexity a Predictor, Control as a Mediator and Posttraumatic Stress Diagnostic Scale as an Outcome Variable

	β	*SE*	*B*	*T*	*P*	LLCI	ULCI
NTSCpos as a Predictor PDS as an outcome variable							
Path *a*	0.22	0.06	0.17	2.69	0.008	0.05	0.29
Path *b*	-0.02	1.16	-4.63	-3.98	<0.001	-6.93	-2.34
Path *c*	-0.01	1.05	-2.06	1.97	0.051	-4.13	<0.01
Path *c'*	<-0.01	1.03	-1.27	-1.24	0.215	-3.31	0.08
NTSCneg as a Predictor and PDS as an outcome variable							
Path *a*	-0.53	0.05	-0.28	-5.80	<0.001	-0.38	-1.19
Path *b*	-0.01	1.22	-3.48	-2.87	0.005	-5.88	-1.09
Path *c*	0.03	0.84	3.68	4.41	<0.001	2.04	5.33
Path *c'*	0.02	0.89	2.70	3.04	0.003	0.95	4.45

Note. LLCI = Lower Limit Confidence Interval; ULCI = Upper Limit Confidence Interval; NTSCpos = Non-trauma self-complexity positive; NTSCneg = Non-trauma self-complexity negative; PDS=Posttraumatic Stress Diagnostic Scale.

In terms of positive non-trauma words, the unstandardised indirect effect was -0.78, and results were based on 10,000 bootstrapped samples indicated that the 95% bias-corrected confidence interval around the bootstrapped mean for the indirect effect were LL = -1.89, UL = -0.12, which suggests that the relationship between positive non-trauma word SC and PDS outcome is mediated by control (Preacher & Hayes, 2004; Shrout & Bolger, 2002).

In terms of negative non-trauma words, the unstandardised indirect effect was 0.98, and the 95% bias-corrected confidence interval around the bootstrapped mean for the indirect effect were LL = 0.28, UL = 1.90, which suggests that the relationship between negative non-trauma word SC and PDS outcome is mediated by control (Preacher & Hayes, 2004; Shrout & Bolger, 2002).

3.3.6.3 Trauma words. The results from these mediation analyses are illustrated in Table 15.

Table 15

Unstandardised and Standardised Coefficients and Statistical Significance for Mediation Analysis with trauma word self-complexity as a Predictor, Control as a Mediator and Posttraumatic Stress Diagnostic Scale as an Outcome Variable

	β	*SE*	*B*	*T*	*P*	LLCI	ULCI
TSCpos as a Predictor PDS as an outcome variable							
Path *a*	0.13	0.11	0.28	2.62	0.009	0.07	0.49
Path *b*	-0.02	1.17	-4.78	-4.10	<0.001	-7.08	-2.48
Path *c*	<-0.01	1.80	-2.36	-1.31	0.190	-5.91	1.18
Path *c'*	<-0.01	1.76	-1.02	-0.58	0.562	-4.49	2.45
TSCneg as a Predictor and PDS as an outcome variable							
Path *a*	-0.39	0.06	-0.34	-5.43	<0.001	-0.47	-0.22
Path *b*	-0.01	1.16	-2.88	-2.47	0.014	-5.18	-0.58
Path *c*	0.03	1.03	6.20	6.02	<0.001	4.17	8.23
Path *c'*	0.02	1.09	5.21	4.78	<0.001	3.06	7.37

Note. LLCI = Lower Limit Confidence Interval; ULCI = Upper Limit Confidence Interval; TSCpos = Trauma self-complexity positive; TSCneg = Trauma self-complexity negative; PDS=Posttraumatic Stress Diagnostic Scale.

In terms of positive trauma words, the unstandardised indirect effect was -1.34, and the 95% bias-corrected confidence interval around the bootstrapped mean

for the indirect effect were LL = -3.18, UL = -0.23. Given that these confidence intervals do not include zero, this indicates that the indirect effect is statistically significant at $p < .05$ (Preacher & Hayes, 2004; Shrout & Bolger, 2002), which suggests that the relationship between positive trauma word SC and PDS outcome is mediated by control.

In terms of negative words, the unstandardised indirect effect was 0.98, and the 95% bias-corrected confidence interval around the bootstrapped mean for the indirect effect were LL = 0.18, UL = 2.07. Given that these confidence intervals do not include zero, this indicates that the indirect effect is statistically significant at $p < .05$ (Preacher & Hayes, 2004; Shrout & Bolger, 2002), which suggests that the relationship between negative trauma word SC and PDS outcome is mediated by control.

3.4 Summary of main findings

In relation to the first research question, negative SC (including trauma and non-trauma self-aspects) was significantly positively correlated with all measures of disrupted posttraumatic psychological adjustment. Specifically, as participants obtained higher scores of negative SC, their scores on all measures of disrupted posttraumatic psychological adjustment increased. Positive SC was only significantly negatively correlated with depression scores.

In regards to the second research question, perceived control was found to correlate negatively with all variants of negative SC (overall, non-trauma and trauma only). Namely, as perceived control increased participants reported lower levels of negative SC. However, control was not significantly correlated with any variant of positive SC (overall, non-trauma and trauma only) partly due to Bonferroni corrections. Perceived control was negatively correlated with all measures of

disrupted posttraumatic psychological adjustment; as control increased participants scored lower on scales accessing posttraumatic symptomatology, trauma-related cognitions, trauma centred identity and depression.

Mediation analyses were used to address the third research question. The results revealed that control significantly mediated the relationship between SC (both positive and negative) and PTSD symptoms.

4-Discussion

4.1 Overview of Discussion

This chapter will begin by discussing the findings of the current study in relation to each of the research questions proposed in the Introduction. Second, the strengths and limitations of the study are considered. Third, the theoretical and clinical implications of the study are explored and suggestions for future research are presented. Finally, the chapter will offer a conclusion.

4.2 Summary of Findings

4.2.1 Research question 1.

The first research question aimed to explore the relationship between SC and the measures of posttraumatic psychological adjustment. It was found that higher levels of negative SC (i.e., overall, non-trauma words and trauma words) was significantly associated with higher levels of PTSD and depression symptomatology, negative trauma-related cognitions, and greater trauma-themed identity. Thus, irrespective of the type of traits available to describe the self-aspects (i.e., trauma related, non-trauma related), constructing a self-representation which contained multiple independent negative traits consistently led to poorer outcomes. Additionally, those who scored higher in positive SC (i.e., overall, non-trauma words and trauma words), reported lower levels of depression. As a whole these results illustrate the importance of the self in relation to trauma.

The finding that higher levels of negative SC were significantly associated with higher levels of PTSD symptoms, mirrored the findings by Morgan and Janoff-Bulman (1994). However, the protective mechanism of positive SC in relation to PTSD symptoms, was not found (Morgan & Janoff-Bulman, 1994). Furthermore, this study observed that greater negative SC was significantly associated with higher

levels of depression. This finding mirrors that of previous research looking at the association between negative SC and depression (e.g., Gara et al., 1993; Woolfolk et al., 1995, 1999). These two findings illustrate that greater negative SC is associated with poorer wellbeing. Initially these findings appear contrary to Linville's (1985, 1987) premise that greater SC is protective against adversity. However, Linville only investigated overall SC, a methodology which has since been highly criticised. When SC is considered as one construct, it is possible that the positive and negative valence is added together, and whichever is strongest takes precedence over the overall representation. This may explain why the results in this field have been mixed. When SC is looked at in terms of its valence, greater complexity is no longer synonymous with wellbeing. Rather, the interpretation of SC varies according to valence.

In this study the protective mechanisms of positive SC were found only in relation to depression, whereby those with greater positive SC experienced significantly lower levels of depression. These results support the protective mechanisms of positive SC in relation to depression found by previous research (e.g., Gara et al., 1993; Woolfolk et al., 1995, 1999). Furthermore, these results are congruent with the depression evidence base which suggests that depression is characterised by a negative cognitive bias (Beck, 1976) and a reduced ability to think positively about the future (Morina, Deeprose, Pusowski, Schmid, & Holmes, 2011). Thus, being able to hold multiple independent positive representations of the self violates the essence of depression.

This study found that greater negative SC was significantly associated with more negative trauma-related cognitions. It seems logical that if someone uses numerous independent negative traits to describe the different aspects of themselves,

they will have more negative content within their self-representation from which to generate trauma-related cognitions. According to the DSM-V (APA, 2013) PTSD is characterised by negative alterations in cognition and mood. Thus, negative SC is significantly correlated with a fundamental component of PTSD symptomatology. This result supports Ehlers and Clark's (2000) suggestion that negative self-appraisals are a fundamental maintaining factor of PTSD. They also support Brewin and Holmes (2003) suggestion that negative beliefs about the self, world and future are central to PTSD and should be targeted in treatment.

In this study negative SC was significantly correlated with greater trauma-themed identity. Thus, participants who described themselves using many independent negative traits described the trauma as being more central to their identity. This is congruent with the mnemonic model (Berntsen & Rubin, 2006) which suggests that the schematic deviations of the trauma memory make it more accessible (Brewer & Treyens, 1981; Brown & Kulik, 1977; Rubin & Kozin, 1984). This forces it to become a cognitive reference point which influences the organization of other autobiographical memories. This also supports the finding that trauma brings about profound, lasting, structural changes to ones sense of self (e.g., Brewin, 2003; Dalgleish & Power 2004; Ehlers et al., 2000; Janoff-Bulman, 1992), which result in the trauma becoming central to one's identity (Berntsen & Rubin, 2006). Furthermore, the results are supported by Berntsen, Rubin, and Siegler (2011) who found the centrality of negative events to ones sense of self was fundamental for PTSD symptomatology and emotional distress.

4.2.2 Research Question 2.

The second research question aimed to explore the relationship between perceived control and a) self-complexity and b) posttraumatic psychological

adjustment. In this study perceived control was significantly negatively correlated with negative SC. Thus, participants who felt like they had more control over the different aspects of themselves, experienced lower levels of negative SC. Extending McConnell et al.'s (2005) research (i.e., that control influences the relationship between SC and wellbeing) to the realm of PTSD. These findings are congruent with research illustrating that greater control is associated to wellbeing (Bandura, 1986; Deci & Ryan, 1985; Ryan & Deci, 2000). However, future research is required to better understand the mechanisms underpinning the relationship between SC and control.

Perceived control was also found to be significantly negatively correlated with all four measures of posttraumatic psychological adjustment. As perceived control over self-aspects increased, participants reported fewer PTSD and depression symptoms, less negative trauma-related cognitions, and less trauma-themed identity. This finding is important because the relationship between perceived control over the self and posttraumatic psychological adjustment had yet to be researched in the SC literature. However, there is research to suggest that control is an important factor when thinking about PTSD (e.g., Ehlers, Maerckers, & Boos, 2000; Jones & Barlow, 1990). These findings support research proposing that PTSD arises from events which are out of one's perceived control and attempts made by individuals to exert control over traumatic situations are protective against the development of PTSD (e.g., Ehlers et al., 1998; Tangney, Baumeister, & Boone, 2004). Similarly the DRT (e.g., Brewin & Holmes, 2003) suggests that PTSD symptoms can be reduced by consciously reasserting perceived control.

The study found that as control increased participants reported less negative trauma related cognitions and less trauma-themed identity. This finding is congruent

with the idea that greater control is associated with a reduction in PTSD symptomatology (e.g., Ehlers et al., 1998; Tangney, Baumeister, & Boone, 2004). Thus, it is understandable that greater control is also associated with reductions in negative trauma related cognitions and trauma-themed identity. Similarly, Ehlers and Clark (2000) suggested that less control is associated with greater negative trauma related cognitions. Furthermore, this finding supports the notion that greater control is associated to wellbeing (Bandura, 1986; Deci & Ryan, 1985; Ryan & Deci, 2000). The mnemonic model failed to consider the role of control, thus this finding makes a valuable contribution to the evidence base (Berntsen & Rubin, 2006).

Finally, this study showed that as control increased participants reported less depressive symptoms. This is compatible with research suggesting that greater control is associated with less depression (McConnell et al., 2005) and less learned helplessness (e.g., Abramson, Seligman, & Teasdale, 1978; Beck, 1976; Seligman, 1975). It is also congruent to with the depression literature which suggests people suffering from depression often perceive events as uncontrollable (Bibring, 1953; Seligman, 1975).

4.2.3 Research Question 3.

The final research question explored whether self-aspect control, mediated the relationship between the SC and PTSD. The results of the mediation analyses showed that perceived control significantly mediated the relationship between SC and PTSD symptoms. It is important to consider this result separately for positive and negative SC. As positive SC increased PTSD symptoms decreased, and this process was mediated by control. This relationship was not found in the correlation analyses which looked at the relationship between positive SC and PTSD symptoms. As negative SC increased so did PTSD symptomatology, again this process was

mediated by control. These findings illustrate the importance of control as a mediating factor when looking at the relationship between SC and posttraumatic symptomatology. This mediating role of control must be explored further, to establish its exact mechanisms.

4.3 Strengths and Limitations

4.3.1 Design.

A cross-sectional design was selected for this study following other prominent research in the area (e.g., Alatiq, Crane, Williams, & Goodwin, 2010). Furthermore, it was deemed appropriate in answering the exploratory research questions posed in this thesis. However, cross-sectional designs cannot make causal inferences (Showers, Zeigler-Hill, & Limke, 2006). Future research intending to capture the moderating effects of SC over time should or endeavouring to make causal inferences, should use a prospective design (Showers, Zeigler-Hill, & Limke, 2006).

A single group design was used for this study, due to the exploratory nature of the research questions. Thus, comparisons were not made between those who did and did not meet a diagnosis of PTSD as done in previous research (Morgan & Janoff-Bulman, 1994). This would have enabled researchers to identify whether those with PTSD have different self-representations as compared to those who do not, thus should be explored in future.

4.3.2 Participants.

A non-clinical, adult community sample was deemed appropriate to address the research questions and was able to detect significant results. It successfully extended previous research which primarily used a student sample (e.g., McConnell et al., 2005; Rothermund & Meiniger, 2004; Schleicher & McConnell, 2005).

The initial power calculation yielded a desirable sample size of 84 participants. Overall 194 participants completed all aspects of the study and were included in the data analyses. This was advantageous as the estimated sample size was based on a conservative effect size (0.3) due to the variability of effect sizes represented in the literature (Rafaeli-Mor & Steinberg, 2002). Thus, the greater sample size enhanced the chance of finding a true effect of the data (Hardon, Hodgkin, & Fresle, 2004). However, it might raise the ethical question of over-recruitment, especially due to the time demands placed on participants who completed this study.

Only 51% of participants who accessed the study completed all aspects of it, thus a high, yet common (Schottenbauer, Glass, Arnkoff, Tendick, & Gray, 2008) drop-out rate was observed. Statistical comparisons showed that participants who completed the study did not differ from those who dropped out in terms of demographic data. Thus, providing no evidence to suggest that the final sample that completed the study differed significantly from those who accessed the study. However, it was not possible to make comparisons based on scores on the outcome measures (i.e., SC, PTSD or depression), thus the participants who completed the study may have differed in a meaningful way.

This research successfully collected information on participant's age and gender, something which previous research (e.g., McConnell et al., 2005; Schleicher & McConnell, 2005; Showers, Zeigler-Hill, & Limke, 2006) had been criticised for underreporting. Similar to previous research (e.g., Morgan & Janoff-Bulman, 1994) this study struggled to recruit men, with men making up only 19.1% of the sample. Future research must be sure to recruit more men to ensure generalizability of their study findings. The sample recruited was more educated than the general population.

According to the UK census (2011) 40% of secondary school students go on to complete higher education, whereas in this sample 93.8% had gone on to complete higher education, impacting on the generalizability of the study findings. A majority of the sample were below 34 years old (62.9%). Whilst this was normal for research of this nature, future research must make attempts to represent all ages. A particular strength of this research was the ability to recruit a trauma sample. All participants experienced a DSM-IV (APA, 1994) criterion A trauma, and 51% met DSM-IV criteria for PTSD. As compared to Morgan and Janoff-Bulman (1994) who used the more general category of negative life event (e.g., relationship breakup, parental divorce and unwanted pregnancy), a criteria which only 93% of their participants satisfied. Furthermore, 57.7% of the participants in this study scored above cut off depression, indicating a clinical risk. This was to be expected considering the co-morbidity research for PTSD and depression (e.g., Kessler et al., 1995). This sample was self-selected, thus those with higher levels of posttraumatic symptoms may not have volunteered to take part, potentially making this sample different from a clinical population.

4.3.3 Measures.

It is possible that asking the demographic questions first may have primed participants to think about more self-aspects (Jacoby, 1983). However, this held the advantage of enabling comparisons to be made between those who dropped out and those who completed the study.

A strength of this study was the use of Showers (1992) modification of the 'trait sorting task' and the addition of trauma specific words (Shower & Larson, 1999). This version of the task enabled separate positive and negative SC score calculations to be performed. Furthermore, it enabled SC to be conceptualised as

overall SC, non-trauma SC and trauma SC. All statistical analyses using these three variations revealed the same thing, showing that they are comparable in their ability to calculate SC in a trauma sample. This study found *H* to be a reliable and accurate measure of SC. However, its calculation was complex and required a computational programme to be built so that it could be calculated for each participant. Due to the difficulty in calculating *H,* it was not possible to calculate other variables from the SC outcome which may have been valuable but were deemed too time consuming. The *H* calculation was limited by the fact that the ratio of positive and negative traits used to describe each self-aspect is not assessed. This raised questions about the validity of positive and negative SC, as their scores were interpreted independently and not in relation to each other. Another limitation of the SC measure is that it does not allow clients to generate their own traits when describing their self-aspects. Whilst this enables scores to be compared across participants, it reduces the potential richness of the data.

The control measure was simple, quick and easy to complete. However, it only focused on control over self-aspects, which might have been too simplistic. It could have been useful to also ask questions about control in relation to the trauma, as they may have better addressed the points raised by the evidence base. The control measure had only been used once in previous research, thus further research which validates its use and examines the validity of the three questions (see section 2.4.2) which create its score could be of benefit.

In this study a number of valid and reliable measures were used in line with previous research (e.g., Brown & Rafaeli, 2007; McConnell et al., 2005; Schleicher & McConnell, 2005). This study advantageously used three measure of posttraumatic psychological adjustment (PDS, CES & PTCI). For ease of reporting

the mood measure CES-D was referred to as the fourth measure of posttraumatic psychological adjustment in this study. The inclusion of these measures enabled a thorough investigation of the relationship between posttraumatic psychological adjustment and SC. The use of a validated PTSD measure (PDS) improved the reliability of these findings as compared to the Morgan and Janoff-Bulman (1994) study. The use of the PTCI and CES enabled self-related trauma appraisals and trauma-themed identity to be examined, which had not been done in previous research. The inclusion of a depression measure was imperative, as depression is an integral part of the posttraumatic response in the aftermath of a trauma (e.g., Miller & Chapman, 2001; O'Donnell, Creamer, & Pattison, 2004).

This study only utilised self-report measures, potentially rendering it subject to the social desirability bias (Paulhus, 1991). However, administering this study online provided participants with anonymity, hopefully reducing the need to engage in a socially desirable manner.

4.3.4 Procedure.

This study successfully used an online survey to recruit a strong sample who met inclusion criteria. Internet recruitment held the advantage of being free from the presence of a researcher, reducing experimenter biases (Paulhus, 1991). However this method failed to recruit adequate numbers of men.

4.3.5 Data analyses.

Transformations of the data were unable to overcome the non-normal distribution of all of the measures. Thus non-parametric statistics were implemented, reducing the power to accurately detect significant effects and increasing the chance of obtaining a Type II error. As several independent correlations were performed,

Bonferroni corrections were utilised to minimise the chance of obtaining a Type I error (Bland & Altman, 1995).

This thesis conducted mediation analyses using bootstrapping. Bootstrapping is considered preferable to other mediation methods as it does not make assumptions about the normality of the data. Furthermore, it has been recommended for use with smaller samples (Preacher & Hayes, 2004). Due to the exploratory nature of this study mediation analyses were only performed on the relationship between SC and posttraumatic symptoms as mediated by control. It is presumed that all of the study variables will be related to some extent so this key mediation was selected. However, further research should strive to better understand the relationship between each of the research variables.

4.4 Theoretical Implications

This study successfully extended previous research by Morgan and Janoff-Bulman (1994) with three key modifications. It used Showers (1992) modification of the trait sorting task, incorporated a measure of control (McConnell et al., 2005) and utilised four validated measures of posttraumatic psychological adjustment (PDS, PTCI, CES, CES-D). These modifications were employed to overcome some of the key theoretical and methodological critiques of previous SC studies (Koch & Shepperd, 2004; Rafaeli-Mor & Steinberg, 2002).

There are two main findings from this research. First, greater negative SC (i.e., overall, non-trauma and trauma) was significantly associated with higher levels of PTSD and depression symptoms, and to other measures of posttrauma disrupted self (i.e., negative trauma-related cognitions and trauma-themed identity). Second, the relationship between SC and PTSD was mediated by perceived control over ones various self-aspects. These two findings support and extend existing research that

has suggested greater negative SC is detrimental for wellbeing (e.g., Morgan & Janoff-Bulman, 1994) as is lower perceptions of control over the self (e.g., McConnell et al., 2005).

The first three assumptions of Linville's (1985, 1987) SC theory (see section 1.7.3) were supported by the current research. However, the fourth assumption which advocated for the existence of an overall SC score was challenged. The results from this study reiterated the importance of considering SC in terms of its positive and negative valence. As if only overall SC is considered, the positive and negative valences may counteract each other, resulting in interpretation challenges. In Linville's (1985, 1987) original studies, greater SC was seen as synonymous to wellbeing. However, Linville (1985, 1987) used more positive than negative traits, and some ambiguous traits making her results difficult to interpret. One of the largest discrepancies in the SC literature has been the composition of traits used in the SC task. This difference may partly explain why the support for the SC theory has been so mixed. This thesis found that greater negative SC was detrimental to wellbeing, whereas positive SC (when control was taken into consideration) was beneficial to wellbeing. These results are consistent with others in the literature (e.g., McConnell et al., 2005; Rafaeli-Mor & Steinberg, 2002), and further validates the use of Showers (1992) trait composition for the SC task.

The SMS (Conway, 2005) may partially explain why greater negative SC was associated with poorer posttraumatic psychological adjustment in this study. The SMS draws on associative theories and suggests that trauma memories are encoded in strong association with the goals of the working self activated during a trauma. Consequently, when one goal is activated, the associated goals and trauma memory may also be triggered, leading to posttraumatic symptomatology. The SC theory also

draws on associative networks; however it only explains associations in terms of the trait words used in describing ones various self-aspects. It is possible that self-aspects are also associated with one another through goals, thus the activation of one goal may trigger the self-aspects associated to it. Thus, future research looking at the utility of SC for PTSD must be sure to incorporate knowledge about goals. This could be done by using more goal words in the trait sort.

The DRT (e.g., Brewin & Holmes, 2003) suggests that people have multiple self-representations or identities which compete to be retrieved. It proposes that trauma activates negative pre-existing identities, and blocks access to positive identities. This theory is congruent with the empirical research which found that those with PTSD struggled to access positive identities (McNally, Lasko, Macklin, & Pitman, 1995). This assertion has been supported by the results of this study, as participants with greater negative SC experienced more posttraumatic symptomatology. However, it is not known from this current study whether those with greater negative SC also had lower comparative positive SC. The DRT (Brewin & Holmes, 2003) also suggests that the trauma memory lacks autobiographical context (similar to the SMS), and is fragmented and disorganised in nature. This appears contrary to the finding of this study where participants were able to create a coherent representation of themselves.

The study findings support Ehlers and Clark's (2000) assertion that negative self-appraisals are fundamental for PTSD. As well as their assertion that negative self-appraisals are linked to mental defeat, in that those with no control during the trauma are more likely to experience negative appraisals. The results from this study also support findings that those who report reduced perceptions of self-control are more prone to depression (e.g., Abramson, Seligman, & Teasdale, 1978). In line with

previous research (McConnell et al., 2005), this study suggests that self-aspect control is an important mediator in determining whether SC is beneficial.

The results of this study have theoretical implications for the SC theory and the models of PTSD. It demonstrated the detrimental effect of negative SC. However, as it did not look at causal inferences it cannot determine whether PTSD results in greater negative SC or whether people with a premorbid negative sense of self are more likely to develop PTSD. Prospective studies are required to unpick this relationship. Future theoretical models of PTSD, should examine the utility of SC as a representational model of the self.

4.5 Clinical Implications

In this study, greater negative SC and lower levels of self-aspect control both lead to greater posttraumatic symptomatology. Thus, clinical interventions that reduce negative self-perceptions and increase one's sense of control over the self could help prevent or treat PTSD symptoms. The detrimental effects of greater negative SC in this study underpinned both posttraumatic symptomatology and depression scores. Thus, targeting this common feature of the self in therapy could benefit them both. This is important because PTSD is associated with high co-morbidity rates (Brown et al., 2001).

Theorists (e.g., Brewin & Holmes, 2003; Conway, 2005; Ehlers & Clark, 2000) have proposed that psychological treatment for PTSD should help survivors contextualise their trauma memory by a process of elaboration. This enables the individual to integrate the trauma into their sense of self, by building associations between pre-trauma and post-trauma autobiographical knowledge/memories (Brewin & Holmes, 2003). Additionally, cognitive treatments must acknowledge the role of maladaptive beliefs and attributions regarding the trauma in creating PTSD

symptomatology (Ehlers & Clark, 2000). The SC task and questions of control may be an appropriate tool to aid in the construction and exploration of a client's self representation. It may identify maladaptive beliefs and attributions, thus providing clinicians with a framework for better understanding the impact of the trauma on their client's sense of self. Extending the SC task by asking clients to indicate how the trauma has impacted upon their sense of self could be of benefit. This could be done through a discussion using the results of the SC task as a guide, or by physically giving clients a card with the word 'trauma' on it and asking them to demonstrate how the card fits into their self-representation.

Once a self-representation has been constructed, clinicians could use cognitive strategies (i.e., thought challenging, belief surveys and diary keeping) to reduce their clients negative SC. Concurrently, clinicians must increase their clients perception of control over their various self-aspects. This could be done using goal setting, problem solving, behavioural experiments and teaching anxiety management techniques (i.e., mindfulness, progressive muscle relaxation, and distraction). Thus, the SC task could be used in the assessment, case-conceptualisation and treatment of those with PTSD. It may have value as a diagnostic tool, by identifying those who are at greater risk of developing posttraumatic symptomatology. Enhancing the consideration of the self in treatment may allow treatments to be better tailored to the client, potentially increasing engagement and minimising drop-out (Hembree & Foa, 2000). However, further prospective research is needed to support these claims.

The DRT (e.g., Brewin & Holmes, 2003) and research by Morgan and Janoff-Bulman (1994), suggested that therapy should enhance clients positive self-identities making them more distinct and creating greater associative links. The results of this study were able to support this assertion in relation to depression, but

only in relation to trauma when control was considered. Nonetheless, enhancing an individual sense of control over the different aspects of themselves whilst simultaneously increasing their positive SC may help to reduce PTSD symptomatology. Practically, clients should be supported to think more positively about themselves in areas of their life not affected by the trauma; 'despite the car accident I am still a good friend, teacher and swimmer'.

Brewin and Holmes (2003) suggests that those with greater discrepancies between their pre-trauma and post-trauma assumptions may find the trauma more difficult to process. In an effort to build associations between pre-trauma and post-trauma autobiographical knowledge/memories the SC task could be used to construct a self-representation before the trauma. Then clinicians could explore what has changed in the self-representation as a result of the trauma. Clinicians could use the SC task to co-construct a self-representation with their clients, which could be worked towards during therapy and used as an outcome measure.

The NICE (2005) recommended treatments for PTSD consider the impact of the trauma on the self and attempt to enhance survivors control over the trauma memory and symptoms. However, without a structural model of self they are limited to focusing on individual self-appraisals. The SC task may be an effective tool to explore the impact of the trauma on the self as a whole. The results from this study have shown that treatment must consider the role of negative SC and control. In order to reduce negative SC, the number of negative self-representations must be reduced as well as their associative links. Furthermore, efforts should be made to help individuals gain more control over their various self-aspects. Further research is needed to better inform treatment.

4.6 Further studies and research directions

Future research must address the methodological issues raised above. Namely, efforts must be made to recruit more men, clinical populations, older adults and people of lower educational statuses, as they are all currently underrepresented in the research. Also, future research is needed to validate the theoretical and clinical implications outlined in this study (see sections 4.4 & 4.5).

As this was the first study to ask whether control mediates the relationship between SC and posttraumatic psychological adjustment, further research is needed to validate the results. Also, prospective designs must be utilised to better understand the exact relationship between each of the study variables and in order to make causal inferences. Future research must clarify the differential mechanisms of positive and negative SC.

Calculations of *H* only look at number of self-aspects created and trait redundancy. Future research must investigate whether calculating the ratio of positive and negative traits used, could help to contextualise the findings from *H*. Furthermore, *H* is heavily weighted by the number of self-aspects and less so by their degree of overlap. Researchers have suggested that other calculations conducted in parallel to *H,* can provide more information about ones SC. These include calculations of compartmentalisation (Showers, 1992), differentiation and integration (Rafaeli-Mor, Gotlib, & Revelle, 1999). However, these additional calculations still require validation. Furthermore, computational programmes which can reliably calculate these measures need to be made available.

The SMS (Conway, 2005; Conway, Meares, & Standart, 2004; Conway & Pleydell Pearce, 2000) describes the self's conflict between the two opposite drives for coherence and correspondence. The results from this study assume

correspondence, thus future research is needed to better understand the impact of these two drives on the memory system. Memory distortions are implicit in PTSD, for example individuals retain memories that correspond with the goals of the working self and alter those that require goal change. It is important to find ways to establish the accuracy of the self-representation.

Additionally, future research must consider how other important factors (i.e., social support) relate to those examined in this study. The efficacy of this research needs to be tested in relation to individual trauma types, as different types of trauma have differential impacts (Carr & McNulty, 2006). Also, qualitative studies could be conducted to better understand individuals' SC constructs. Finally, alternative explanations of the study findings should also be explored. Once these research questions have been investigated empirically, interventions aimed at identified targets can be developed and evaluated.

4.7 Conclusions

A large body of research has accumulated around the potential protective mechanisms of greater SC. The benefits of SC have been most widely reported in relation to depression. However, new studies are arising exploring the efficacy of SC with a variety of different mental health presentations. To date only one study has explored the relationship between SC and trauma (Morgan & Janoff-Bulman, 1994). Since its publication a key study trying to explain why studies have varied in their ability to detect the stress-buffering effects of SC has been published (McConnell et al., 2005). This paper attributed the discrepancy in results to previous researcher's inability to consider the importance of self-aspect control (McConnell et al., 2005). McConnell et al. (2005) demonstrated that greater SC was only beneficial to wellbeing for those who felt that their various self-aspects were under their control.

This thesis extended the current evidence base by building on the foundations of these two studies. It investigated whether control mediated the relationship between SC and posttraumatic psychological adjustment.

The results from this study were promising. They showed that greater negative SC was significantly related to poorer posttraumatic psychological adjustment. Greater positive SC was significantly related to lower depression scores. Control was found to mediate the relationship between SC and PTSD symptoms. These mediation effects were found for both positive and negative SC. Furthermore, the results reiterated the importance of considering SC in terms of its positive and negative components.

The interpretations of these findings were discussed, in light of the strengths and limitations of the study. Then, the theoretical and clinical implications of the study were explored. The relationship between SC and posttraumatic psychological adjustment is likely to be a multifaceted one which comprises an assortment of important factors (i.e., social support, pre-morbid mental health, trauma type). Future research is needed to reveal the processes and mechanisms underpinning SC and its relationship with posttraumatic psychological adjustment. Findings from such research may have further clinical and theoretical implications. Nonetheless, this study set the groundwork for thinking about the relationship between SC, posttraumatic psychological adjustment and control.

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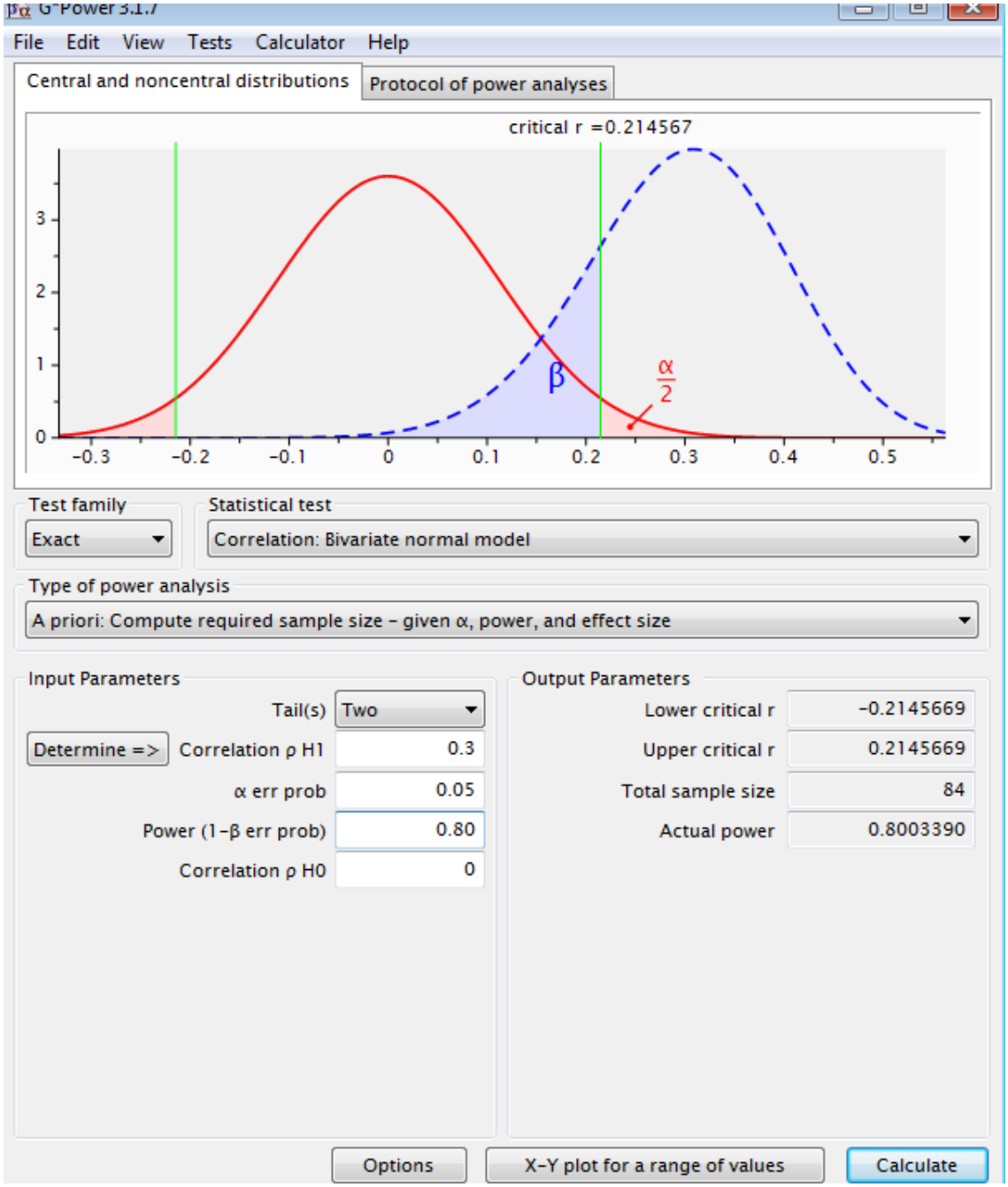
Appendix

Appendix A: Screen shot of G-Power



Appendix B: Self-Complexity Trait Words (Showers, 1992)

	Positive trait words	**Negative trait words**
1	Successful	Disagreeing
2	Giving	Hopeless
3	Capable	Lazy
4	Confident	Self-centred
5	Comfortable	Unloved
6	Independent	Not the “real me”
7	Needed	Immature
8	Communicative	Weary
9	Mature	Uncomfortable
10	Organised	Sad and blue
11	Intelligent	Incompetent
12	Loveable	Insecure
13	Fun & Entertaining	Worthless
14	Interested	Inferior
15	Outgoing	Irritable
16	Energetic	Like a failure
17	Hardworking	Isolated
18	Happy	Indecisive
19	Friendly	Disorganised
20	Optimistic	Tense

	Positive trauma words	**Negative trauma words**
1	Wise	Damaged
2	Hopeful	Fearful
3	Adaptive	Vulnerable
4	Secure	Hurt
5	Strong	Victim
6	Safe	Suffering
7	Resilient	Traumatised

Appendix C: Trauma words

These are words trauma survivors can use in describing themselves, can you please rate each word for how trauma related you think they are and how positive or negative you think they are?

Adaptive

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Afraid

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Alert

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Alone

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Angry

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Anxious

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Appreciative

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Ashamed

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Avoidant

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Bad

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Blocked

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Broken

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Changed

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Compassionate

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Connected

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Confused

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Confident

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Damaged

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Defeated

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Denial

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Destroyed

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Detached

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Dirty

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Disconnected

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Disgusted

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Fearful

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Frightened

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Frozen

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Guilty

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Healthy

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Helpless

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Hero

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Hopeful

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Hopeless

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Hurt

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Incapable

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1	2	3	4	5	6	7
Not at all						Very

Incompetent

1	2	3	4	5	6	7
Not related						Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1	2	3	4	5	6	7
Not at all						Very

Injured

1	2	3	4	5	6	7
Not related						Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1	2	3	4	5	6	7
Not at all						Very

Insecure

1	2	3	4	5	6	7
Not related						Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1	2	3	4	5	6	7
Not at all						Very

Irritable

1	2	3	4	5	6	7
Not related						Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1	2	3	4	5	6	7
Not at all						Very

Isolated

1	2	3	4	5	6	7
Not related						Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1	2	3	4	5	6	7
Not at all						Very

Lost

1	2	3	4	5	6	7
Not related						Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Lucky

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Negative

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Nervous

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Numb

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Optimistic

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Overwhelmed

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Pessimistic

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Positive

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Powerful

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Powerless

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Preoccupied

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Proud

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Resilient

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Responsible

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Ruined

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Safe

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Scared

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Secure

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Stressed

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Strong

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Stuck

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Suffering

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Survivor

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Target

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Trapped

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Traumatised

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Undeserving

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Unlucky

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Unsafe

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Useless

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Victim

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Vulnerable

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Weak

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Wise

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Withdrawn

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1 2 3 4 5 6 7
Not at all Very

Wounded

1 2 3 4 5 6 7
Not related Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1	2	3	4	5	6	7
Not at all						Very

Wronged

1	2	3	4	5	6	7
Not related						Very related

Is this word more positive or negative (Highlight which one)? How positive/negative is the word?

1	2	3	4	5	6	7
Not at all						Very

Can you think of any other words a trauma survivor may use in describing themselves?

Thank you for your time

Appendix D: A worked example of how overall positive self-complexity is calculated.

An example of participant's self-complexity traits clustered into groups representing six different self-aspects

1	**2**	**3**	**4**	**5**	**6**
Wise+*	Comfortable+	Successful+	Wise+*	Damaged-*	Giving+
Adaptive+*	Needed+	Capable+	Giving+	Confident+	Capable+
Needed+	Safe+*	Independent+	Confident+	Independent+	Confident+
Mature+	Mature+	Organised+	Intelligent+	Uncomfortable-	Comfortable+
Organised+	Secure+*	Insecure-	Interested+	Suffering-*	Safe+*
Incompetent-	Happy+*	Fun and entertaining+	Happy+	Fun and entertaining+	Communicative+
Inferior-		Interested+	Optimistic+	Happy+	Secure+*
Isolated-		Hardworking+		Traumatised-*	Interested+
Happy+		Happy+		Resilient+*	Hardworking+
					Happy+
					Optimistic+
					Resilient+

Note: +=Positive trait, -=Negative trait, *=Trauma trait

An example of a participant's positive only self-complexity traits clustered into groups representing six different self-aspects

1	2	3	4	5	6
Wise*	Comfortable	Successful	Wise*	Confident	Giving
Adaptive*	Needed	Capable	Giving	Independent	Capable
Needed	Safe*	Independent	Confident	Fun and entertaining	Confident
Mature	Mature	Organised	Intelligent	Happy	Comfortable
Organised	Secure*	Fun and entertaining	Interested	Resilient*	Safe*
Happy	Happy*	Interested	Happy		Communicative
		Hardworking	Optimistic		Secure*
		Happy			Interested
					Hardworking
					Happy
					Optimistic

Note: *=Trauma trait

Attribute cluster 1# (In group 1 only): *Adaptive* ($n_1 = 1$)
Attribute cluster 2# (In group 3 only): *Successful* ($n_2 = 1$)
Attribute cluster 3# (In group 4 only): I*ntelligent* ($n_3 = 1$)
Attribute cluster 4# (In group 6 only): *Communicative* ($n_4 = 1$)
Attribute cluster 5# (In group 1 and 4): *Wise* ($n_5 = 1$)
Attribute cluster 6# (In group 1 and 2): *Needed, Mature* ($n_6 = 2$)
Attribute cluster 7# (In group 1 and 3): *Organised* ($n_7 = 1$)
Attribute cluster 8# (In group 1, 2, 3, 4, 5 and 6): *Happy* ($n_8 = 1$)
Attribute cluster 9# (In group 2 and 6): *Comfortable, safe, secure* ($n_9 = 3$)
Attribute cluster 10# (In group 3 and 6): *Capable, hardworking* ($n_{10} = 2$)
Attribute cluster 11# (In group 3 and 5): *Independent, Fun and Entertaining* ($n_{11} = 2$)
Attribute cluster 12# (In group 3, 4 and 6): *Interested* ($n_{12} = 1$)
Attribute cluster 13# (In group 4 and 6): *Giving, optimistic* ($n_{13} = 2$)
Attribute cluster 14# (In group 4, 5 and 6): *Confident* ($n_{14} = 1$)
Attribute cluster 15# (In group 5 and 6): *Resilient* ($n_{15} = 1$)
Residual positive categories 16# (in no group):*Strong*, Outgoing, Energetic, Friendly* ($n_{16} = 4$)

$H = I\log_2 27 - 1/27 (1 \log_2 1 + 1 \log_2 1 + 1 \log_2 1 + 1 \log_2 1 + 1 \log_2 1 + 2 \log_2 2 + 1 \log_2 1 + 1 \log_2 1 + 3 \log_2 3 + 2 \log_2 2 + 2 \log_2 2 + 1 \log_2 1 + 2 \log_2 2 + 1 \log_2 1 + 1 \log_2 1 + 4 \log_2 4)$

$H = 4.75 – 1/27 (0 + 0 + 0 + 0 + 0 + 2 + 0 + 0 + 4.75 + 2 + 2 + 0 + 2 + 0 + 0 + 8)$

$H = 4.75 – 0.77 =$ **3.98**

Appendix E: Post-traumatic stress diagnostic scale (PDS)

INSTRUCTIONS

Part 1.
Many people have lived through or witnessed a very stressful and traumatic event at some point in their lives. Below is a list of traumatic events. Put a tick in the box next to ALL of the events that have happened to you or that you have witnessed.

(1) ☐ Serious accident, fire, or explosion (for example, an industrial, farm, car, plane, or boating accident)

(2) ☐ Natural disaster (for example, cyclone, flood, tornado, hurricane, flood, or major earthquake)

(3) ☐ Non-sexual assault by a family member or someone you know (for example, being mugged, physically attacked, shot, stabbed, or held at gunpoint)

(4) ☐ Non-sexual assault by a stranger (for example, being mugged, physically attacked, shot, stabbed, or held at gunpoint)

(5) ☐ Sexual assault by a family member or someone you know (for example, rape or attempted rape)

(6) ☐ Sexual assault by a stranger (for example, rape or attempted rape)

(7) ☐ Military combat or war zone

(8) ☐ Sexual contact when you were younger than 18 with someone who was 5 or more years older than you (for example, contact with genitals, breasts)

(9) ☐ Imprisonment (for example, prison inmate, prisoner of war, hostage)

(10) ☐ Torture

(11) ☐ Life threatening illness

(12) ☐ Other traumatic event

(13) If you marked item 12, specify the traumatic event below.

_____

_____

_____

___

Part 2.

(14) If you marked more than one traumatic event in Part 1, put a tick in the box below next to the event *that bothers you the most*. If you only marked one traumatic event in Part 1, mark the same one below.

☐ Accident

☐ Disaster

☐ Non-sexual assault by a family member or someone you know

☐ Non-sexual assault by a stranger

☐ Sexual assault by a family member or someone you know

☐ Sexual assault by a stranger

☐ Combat

☐ Sexual contact when you were younger than 18 with someone who was 5 or more years older

☐ Imprisonment

☐ Torture

☐ Life threatening illness

☐ Other

In the lines below, briefly describe the traumatic event you marked above.

_____

_____

_____

___

Below are several questions about the traumatic event you just described above.

(15) How long ago did the traumatic event happen? (circle ONE)

1 Less than 1 month
2 1 to 3 months
3 3 to 6 months
4 6 months to 3 years
5 3 to 5 years

6 More than 5 years

For the following questions, circle Yes or No.

During this traumatic event:

(16) Were you physically injured? **YES** **NO**

(17) Was someone else physically injured? **YES** **NO**

(18) Did you think your life was in danger? **YES** **NO**

(19) Did you think someone else's life was in danger? **YES** **NO**

(20) Did you feel helpless? **YES** **NO**

(21) Did you feel terrified? **YES** **NO**

Part 3.

Below is a list of problems that people sometimes have after experiencing a traumatic event. Read each one carefully and circle the number (0-3) that best describes how often that problem has bothered you IN THE PAST MONTH. Rate each problem with respect to the traumatic event you described in Item 14.

0 Not at all or only one time
1 Once a week or less/once in a while
2 2 to 4 times a week/half the time
3 5 or more times a week/almost always

(22)	Having upsetting thoughts or images about the traumatic event that came into your head when you didn't want them to	0	1	2	3
(23)	Having bad dreams or nightmares about the traumatic event	0	1	2	3

(24)	Reliving the traumatic event, acting or feeling as if it was happening again	0	1	2	3
(25)	Feeling emotionally upset when you were reminded of the traumatic event (for example, feeling scared, angry, sad, guilty, etc.)	0	1	2	3
(26)	Experiencing physical reactions when you were reminded of the traumatic event (for example, breaking out in a sweat, heart beating fast)	0	1	2	3
(27)	Trying not to think about, talk about, or have feelings about the traumatic event	0	1	2	3
(28)	Trying to avoid activities, people, or places that remind you of the traumatic event	0	1	2	3
(29)	Not being able to remember an important part of the traumatic event	0	1	2	3
(30)	Having much less interest or participating much less often in important activities	0	1	2	3
(31)	Feeling distant or cut off from people around you	0	1	2	3
(32)	Feeling emotionally numb (for example, being unable to cry or unable to have loving feelings)	0	1	2	3
(33)	Feeling as if your future plans or hopes will not come true(for example, you will not have a career, marriage, children, or a long life)	0	1	2	3
(34)	Having trouble falling or staying asleep	0	1	2	3
(35)	Feeling irritable or having fits of anger	0	1	2	3
(36)	Having trouble concentrating (for example, drifting in and out of conversation, losing track of a story on television, forgetting what you read)	0	1	2	3
(37)	Being overly alert (for example, checking to see who is around you, being uncomfortable with your back to the door, etc.)	0	1	2	3
(38)	Being jumpy or easily startled (for example, when someone walks up behind you)	0	1	2	3

(39) How long have you been experiencing the problems that you reported above? (circle ONE)

1 Less than 1 month
2 1 to 3 months
3 More than 3 months

(40) How long after the traumatic event did these problems begin? circle ONE)

1 Less than 6 months
2 6 or more months

Part 4

Indicate below if the problems you rate in Part 3 have interfered with any of the following areas in your life DURING THE PAST MONTH. Circle YES or NO.

(41) Work	**YES**	**NO**
(42) Household chores and duties	**YES**	**NO**
(43) Relationships with friends	**YES**	**NO**
(44) Fun and leisure activities	**YES**	**NO**
(45) Schoolwork	**YES**	**NO**
(46) Relationships with your family	**YES**	**NO**
(47) Sex life	**YES**	**NO**
(48) General satisfaction with life	**YES**	**NO**
(49) Overall level of functioning in all areas of your life	**YES**	**NO**

Appendix F: The Posttraumatic Cognitions Inventory (PTCI)

TASK 7: INSTRUCTIONS

Below is a list of thoughts people sometimes have after a stressful life events. Please read each item, and then indicate how much you agree with each statement in regards to the past seven days with respect to the traumatic event you described above on page 3. Please circle the appropriate response.

	Totally Disagree	Disgree Very Much	Disagree Slightly	Neutral	Agree Slightly	Agree Very Much	Totally Agree
Nothing good can happen to me anymore	1	2	3	4	5	6	7
My life has been destroyed by the trauma	1	2	3	4	5	6	7
I have no future	1	2	3	4	5	6	7
I am a weak person	1	2	3	4	5	6	7
I can't stop bad things from happening to me	1	2	3	4	5	6	7
I have permanently changed for the worse	1	2	3	4	5	6	7
My reactions since the event show that I am a lousy coper	1	2	3	4	5	6	7
If I think about the event, I will not be able to handle it	1	2	3	4	5	6	7
I will never be able to	1	2	3	4	5	6	7

feel normal emotions again							
I feel like an object not a person	1	2	3	4	5	6	7
I can't deal with even the slightest upset	1	2	3	4	5	6	7
I can't rely on myself	1	2	3	4	5	6	7
My reactions since the event mean that I am going crazy	1	2	3	4	5	6	7
I used to be a happy person but now I am always miserable	1	2	3	4	5	6	7
I feel dead inside	1	2	3	4	5	6	7
I can't trust that I will do the right thing	1	2	3	4	5	6	7
I feel like I don't know myself anymore	1	2	3	4	5	6	7
There is something wrong with me as a person	1	2	3	4	5	6	7
I am inadequate	1	2	3	4	5	6	7
I feel isolated and set apart from others	1	2	3	4	5	6	7
I will not be able to control my anger and will do	1	2	3	4	5	6	7

something terrible							
I have to be especially careful because you never know what can happen next	1	2	3	4	5	6	7
People are not what they seem	1	2	3	4	5	6	7
The world is a dangerous place	1	2	3	4	5	6	7
You can never know who will harm you	1	2	3	4	5	6	7
People can't be trusted	1	2	3	4	5	6	7
I have to be on my guard at all times	1	2	3	4	5	6	7
I can't rely on other people	1	2	3	4	5	6	7
The event happened because of the way I acted	1	2	3	4	5	6	7
There is something about me that made the even happen	1	2	3	4	5	6	7
The event happened to me because of the sort of person I am	1	2	3	4	5	6	7
Somebody else would not have gotten into	1	2	3	4	5	6	7

the situation							
Somebody else would have stopped the event from happening	1	2	3	4	5	6	7

Appendix G: Centrality of Events Scale (CES)

INSTRUCTIONS

Please think back upon the most stressful or traumatic event in your life and answer the following questions in an honest and sincere way, by circling a number from 1 to 5.

1. This event has become a reference point for the way I understand new experiences.

1 2 3 4 5
Totally disagree **Totally agree**

2. I automatically see connections and similarities between this event and experiences in my present life.

1 2 3 4 5
Totally disagree **Totally agree**

3. I feel that this event has become part of my identity.

1 2 3 4 5
Totally disagree **Totally agree**

4. This event can be seen as a symbol or mark of important themes in my life.

1 2 3 4 5
Totally disagree **Totally agree**

5. This event is making my life different from the life of most other people.

1 2 3 4 5
Totally disagree **Totally agree**

6. This event has become a reference point for the way I understand myself and the world.

1 2 3 4 5
Totally disagree **Totally agree**

7. I believe that people who haven't experienced this type of event think differently than I do.

1 2 3 4 5
Totally disagree **Totally agree**

8. This event tells a lot about who I am.

1 2 3 4 5
Totally disagree **Totally agree**

9. I often see connections and similarities between this event and my current relationship with other people.

1 2 3 4 5
Totally disagree **Totally agree**

10. I feel that this event has become a central part of my life story.

1 2 3 4 5
Totally disagree **Totally agree**

11. I believe that people who haven't experienced this type of event, have a different way of looking upon themselves than I have.

1 2 3 4 5
Totally disagree **Totally agree**

12. This event has coloured the way I think and feel about other experiences

1 2 3 4 5
Totally disagree **Totally agree**

13. This event has become a reference point for the way I look upon my future.

1 2 3 4 5
Totally disagree **Totally agree**

14. If I were to weave a carpet of my life, this event would be in the middle with threads going out to many other experiences.

1 2 3 4 5
Totally disagree **Totally agree**

15. My life story can be divided into two main chapters: one is before and one is after this event happened.

1 2 3 4 5
Totally disagree **Totally agree**

16. This event permanently changed my life

1 2 3 4 5
Totally disagree **Totally agree**

17. I often think about the effects this event will have on my future.

1 2 3 4 5
Totally disagree **Totally agree**

18. This event was a turning point in my life.

1 2 3 4 5
Totally disagree **Totally agree**

19. If this event had not happened to me, I would be a different person today.

1 2 3 4 5
Totally disagree **Totally agree**

20. When I reflect upon my future, I often think back to this event.

1 2 3 4 5
Totally disagree **Totally agree**

Appendix H: Center for Epidemiologic Studies Depression Scale (CES-D)

Center for Epidemiologic Studies Depression Scale (CES-D), NIMH

Below is a list of the ways you might have felt or behaved. Please tell me how often you have felt this way during the past week.

	During the Past Week			
	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of time (3-4 days)	Most or all of the time (5-7 days)
1. I was bothered by things that usually don't bother me.	☐	☐	☐	☐
2. I did not feel like eating; my appetite was poor.	☐	☐	☐	☐
3. I felt that I could not shake off the blues even with help from my family or friends.	☐	☐	☐	☐
4. I felt I was just as good as other people.	☐	☐	☐	☐
5. I had trouble keeping my mind on what I was doing.	☐	☐	☐	☐
6. I felt depressed.	☐	☐	☐	☐
7. I felt that everything I did was an effort.	☐	☐	☐	☐
8. I felt hopeful about the future.	☐	☐	☐	☐
9. I thought my life had been a failure.	☐	☐	☐	☐
10. I felt fearful.	☐	☐	☐	☐
11. My sleep was restless.	☐	☐	☐	☐
12. I was happy.	☐	☐	☐	☐
13. I talked less than usual.	☐	☐	☐	☐
14. I felt lonely.	☐	☐	☐	☐
15. People were unfriendly.	☐	☐	☐	☐
16. I enjoyed life.	☐	☐	☐	☐
17. I had crying spells.	☐	☐	☐	☐
18. I felt sad.	☐	☐	☐	☐
19. I felt that people dislike me.	☐	☐	☐	☐
20. I could not get "going."	☐	☐	☐	☐

SCORING: zero for answers in the first column, 1 for answers in the second column, 2 for answers in the third column, 3 for answers in the fourth column. The scoring of positive items is reversed. Possible range of scores is zero to 60, with the higher scores indicating the presence of more symptomatology.

Appendix I: Ethical approval

Faculty of Medicine and Health Sciences Research Ethics Committee

University of East Anglia

Ms Kerrie Channer
Clinical Psychology Trainee
Postgraduate Research Office
Elizabeth Fry Building
University of East Anglia
NR4 7TJ

Research & Enterprise Services
West Office (Science Building)
University of East Anglia
Norwich Research Park
Norwich, NR4 7TJ

Telephone: +44 (0) 1603 591720

Email: fmh.ethics@uea.ac.uk

Web: www.uea.ac.uk/researchandenterprise

25th April 2014

Dear Kerrie,

Title: Does control mediate the relationship between self-complexity and posttraumatic psychological adjustment in a sample of adult trauma survivors?

Reference 2013/2014 – 40

Thank you for your e-mail dated 11.04.14 notifying us of the amendments you would like to make to your above proposal. These have been considered by the Chair of the Faculty Research Ethics Committee and we can now confirm that your amendments have been approved.

Please can you ensure that any further amendments to either the protocol or documents submitted are notified to us in advance, and also that any adverse events which occur during your project are reported to the Committee.

Please can you also arrange to send us a report once your project is completed.

Yours sincerely,

Yvonne Kirkham
Project Officer

CC Laura Jordan

Appendix J: Information sheets

University of East Anglia, Norwich, NR4 7TJ
Email: k.channer@uea.ac.uk
www.med.uea.ac.uk/psychology

PARTICIPANT INFORMATION SHEET

Study title: Exploring how we see ourselves as a result of our life experiences and its influence on posttraumatic adjustment

We would like to invite you to take part in a research study. Before you decide, we would like to explain why the research is being carried out and what it will involve for you. Please read the following information carefully. Take time to decide whether or not you wish to take part.

1. What is the purpose of the study?

The aim of the study is to investigate the relationship between how we see ourselves as a result of our life experiences and the impact of that on posttraumatic psychological adjustment. The study will be carried out by Ms Kerrie Channer, Trainee Clinical Psychologist at the University of East Anglia.

2. Who is being invited to participate?

We are looking for 84 adult participants to take part in the study. Participants must be able to complete tasks in English, be over 18 years of age and had an experience of trauma (i.e. car accident, injury/prolonged illness, natural disaster, assault/ violence, attack).

3. Do I have to take part?

No. It is up to you to decide whether or not to take part. Your participation is totally voluntary. After you have read this information, you will be asked to click a box that shows you are happy to take part. If you have further questions, you may email the researcher before, during or after the study *(study email address goes here).*

4. What will happen if I take part?

If you agree to take part in the study you will be asked to firstly give consent. You will then be given several questionnaires to complete. These will assess how you see yourself, previous negative life experiences (including trauma experiences) and mood. You will then be asked to fill in some brief non identifiable questions about yourself (e.g. age, education, ethnicity). Finally,

you will be asked if you would like to enter a draw to win a voucher for your participation. The study will take approximately 45 minutes to complete and if possible we would prefer you to complete it in one sitting (however, you may take breaks).

5. Can I stop taking part if I change my mind?

If you decide to take part in the study you can change your mind about participating and withdraw from the study at any point. If you chose to withdraw from the study you do not have to provide a reason and there will be no consequences. If you chose to withdraw the information you have already provided will be destroyed and not used in the research.

6. Will my taking part in this study be anonymous and kept confidential?

Yes. All the collected data will be anonymous and treated as confidential. This means that we will not ask you to write your name or address on any of the measures. A number will be used to link the different measures and this will not be able to be linked with your details in any way. All information that we enter on the computer will be secured with a password. Once the study is completed, all the information will be securely stored and archived at the University of East Anglia for 10 years.

7. What will happen to the results of the research study?

The information collected will be written into articles and published in a relevant journal. You will not be identified in any of these articles. If you are interested in finding out about the results from the study you will be given a chance at the end of the study to leave your email or postal address. These details will be kept separate from your responses and will not be able to be linked in any way. After we have sent you information about what we have found your email/postal addresses will be destroyed.

8. What are the possible disadvantages or risks of taking part?

Whilst research shows that questions about trauma does not in general pose risks to participants' wellbeing. It is possible that you may feel some distress during the task. If you do feel distress, you may stop completing the study at any point. If you feel distressed at any point during or after the task, then you are encouraged to contact the researcher, or your local General Practitioner (GP), or mental health support services such as MIND (08457 660163) or Samaritans (08457 909090).

9. What are the possible benefits of taking part?

It is hoped that this research will improve our understanding of the relationship between ones perception of self and posttraumatic psychological adjustment. This is important as recent research has shown the self to be an

important factor in trauma but little is known about this area. Therefore, the need to further our knowledge on this area is important.

10. Complaints

If you have any further concerns about any aspects of the study you should contact me. My contact details are: Kerrie Channer, k.channer@uea.ac.uk. University of East Anglia, School of Medicine, Health Policy and Practice, Elizabeth Fry Building, NR4 7TJ, Phone number 01603 591158.

If you remain unsatisfied and wish to complain formally, you can do this by contacting either Professor Kenneth Laidlaw, k.laidlaw@uea.ac.uk. University of East Anglia, School of Medicine, Health Policy and Practice, Elizabeth Fry Building, NR4 7TJ, Phone number 01603 59 3600. Or alternatively the Associate Dean for Research in the Faculty of Health University of East Anglia. Phone number 01603 456161.

11. Who is organizing and funding the research?

This research is being organized by Ms Kerrie Channer (Trainee Clinical Psychologist) under the supervision of Dr Laura Jobson (Clinical Psychologist, l.jobson@uea.ac.uk) and is being funded by the University of East Anglia.

12. Has the study been approved?

This study has been reviewed by the Faculty of Health University of East Anglia Research Ethics Committee. This study has received a favorable ethical opinion and approval.

13. Further information

If there is anything that is not clear, or if you would like more information, please email me at *(study email address goes here).*

We wish to thank you for taking time to read this sheet.

Information form date of issue: 14/1/14
Information form version: 1

Appendix K: Participant Informed Consent Forms

University of East Anglia, Norwich, NR4 7TJ
Email: k.channer@uea.ac.uk
www.med.uea.ac.uk/psychology

CONSENT FORM FOR RESEARCH

Study title:

Exploring the relationship between how we see ourselves as a result of our life experiences

Name of researchers

Ms Kerrie Channer, Trainee Clinical Psychologist
Dr Laura Jobson, Lecturer in Clinical Psychology

Please tick ✓ the box if you agree with the sentence.

I agree to take part in the above research. I have read the participant information sheet. I understand what my role will be in this research, and all of my questions have been answered to my satisfaction. ☐

I understand that taking part in this research study is my choice. ☐

I understand that I can leave the research at any time (even while doing the questionnaires) without giving a reason. ☐

I have been informed that the confidentiality of the information I provide will be safeguarded. ☐

I understand that relevant sections of my data collected during the study may be looked at by individuals from regulatory authorities where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records. ☐

I consent to take part in this study. ☐

Consent form date of issue: 14/1/14
Consent form version: 1

Appendix L: Study advert

University of East Anglia, Norwich, NR4 7TJ
Email: k.channer@uea.ac.uk
www.med.uea.ac.uk/psychology

EXPLORING HOW WE SEE OURSELVES AS A RESULT OF OUR LIFE EXPERIENCES AND INFLUENCES ON POSTTRAUMATIC ADJUSTMENT

We would like to invite you to take part in a research study. Before you decide, please read the following information carefully. Take time to decide whether or not you wish to take part.

1. What is the purpose of the study?

The aim of the study is to investigate the relationship between how we see ourselves as a result of our life experiences. The study will be carried out by Ms Kerrie Channer, Trainee Clinical Psychologist at the University of East Anglia.

2. Who is being invited to participate?

We are looking for 84 adult participants to take part in the study. Participants must be able to complete tasks in English, be over 18 years of age and had an experience of trauma (i.e. car accident, injury/prolonged illness, natural disaster, assault/violence, attack).

3. What will happen if I take part?

This study is being conducted online and takes approximately 45 minutes to complete, so you can take part in your own time. If you agree to take part you will be firstly asked to give consent. You will then be presented with several questionnaires to complete. These will assess how you see yourself, previous negative life experiences (including trauma experiences) and mood. You will then be asked to fill in some brief non-identifiable questions about yourself (e.g. age, education, ethnicity). Finally, you will be asked if you would like to enter a draw to win a voucher for your participation.

4. What will happen to the results of the research study?

The information collected will be written into articles and published in a relevant journal. You will not be identified in any of these articles. If you are interested in finding out about the results from the study you will be given a chance at the end of the study to leave your email or postal address. It is hoped that this research will improve our understanding of the relationship between how we see ourselves as a result of our life experiences.

5. How do I find out more?

If you would like further information my contact email address is: Kerrie Channer, *(study email address will go here)*. My postal address is Kerrie Channer, University of East Anglia, School of Medicine, Health Policy and Practice, Elizabeth Fry Building, NR4 7TJ.

6. How do I take part?

Please follow this link *(study link will go here)*

Thank you for taking time to read this sheet.

Appendix M: Debriefing form

University of East Anglia, Norwich, NR4 7TJ
Email: k.channer@uea.ac.uk
www.med.uea.ac.uk/psychology

PARTICIPANT DEBRIEF FORM

Study title: Exploring how we see ourselves as a result of our life experiences and influences on posttraumatic adjustment

Thank you for participating as a research participant in the present study exploring how relationship between how you see yourself (Self-Complexity) as a result of your life experiences and how that relates to posttraumatic adjustment.

If you know of any friends or acquaintances that are eligible to participate in this study, we request that you do not discuss the details of the study with them until after they have had the opportunity to participate. Prior knowledge of questions asked during the study can invalidate the results. We greatly appreciate your cooperation.

If you have any questions or feedback regarding this study, please feel free to contact me. My contact details are: Kerrie Channer, *(study email address goes here)*. University of East Anglia, School of Medicine, Health Policy and Practice, Elizabeth Fry Building, NR4 7TJ.

If you feel unsatisfied with this study and wish to complain formally, you can do this by contacting either Professor Kenneth Laidlaw, k.laidlaw@uea.ac.uk. University of East Anglia, School of Medicine, Health Policy and Practice, Elizabeth Fry Building, NR4 7TJ, Phone number 01603 59 3600. Or alternatively the Associate Dean for Research in the Faculty of Health University of East Anglia. Phone number 01603 456161.

If you feel distressed by participation in this study, we encourage you to contact me directly, your local General Practitioner (GP), or mental health support services such as MIND (08457 660163) or Samaritans (08457 909090).

If you wish to receive an overview of the study results once they are available, please submit your contact details using this link *(link to contact detail page).*

Finally, to thank you for your time we would like to offer you the opportunity to enter a prize draw to win one of ten £10 Amazon vouchers. If you would like to enter the draw, please submit your contact details using this link *(link to contact detail page).*

Thanks again for your participation.

Debriefing form date of issue: 14/1/14
Debriefing form version: 1