

**PHENOMENOLOGICAL CHARACTERISTICS OF  
AUTOBIOGRAPHICAL EVENT MEMORY**

by

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B.A., University of British Columbia, 2001

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## ABSTRACT

Controversy exists over the relationship between experiencing a subjectively distressing, or 'traumatic', event and one's memory for it. Divergent findings from autobiographical memory studies have given rise to a debate concerning the nature of traumatic memory. Although discrepant findings may be accounted for by differing methodologies, it is more likely that they reflect the variability of trauma's association with memory. Factors relating to both the individual and to the type of event that is experienced interact in influencing a person's memory for that experience. The focus of the present study was to compare reports of memory clarity across emotionally distressing, emotionally positive, and non-emotional autobiographical events. In addition, individual difference factors were also examined in relation to memory clarity. The results indicate that factors related to both event type and individual differences are associated with one's memory for that event, and are discussed in relation to the forensic arena.

DEDICATION

This work is dedicated to my grandfather - everything I do is to make you proud.

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## PHENOMENOLOGICAL CHARACTERISTICS OF AUTOBIOGRAPHICAL EVENT MEMORY

### Introduction

Controversy exists over the relationship between experiencing a subjectively distressing event and one's memory for it. Divergent findings from autobiographical memory studies have given rise to a debate concerning the nature of traumatic memory. Support exists for both the *trauma superiority argument*, which contends that memory for trauma is often enhanced rather than impaired, compared to memories for other types of events, and the *traumatic memory argument*, which posits that experiencing a traumatic event has a negative influence on memory for that event (see Porter & Birt, 2001). The latter has represented the prevailing historical clinical view of traumatic memory. Although the variety of differing methods (i.e., experimental, archival, field) employed across these studies may account for some of the divergent findings, it is also likely that the inconsistent findings reflect the variability of trauma's association with memory. Indeed, aspects relating both to the individual and to the type of event that is experienced interact in influencing a person's memory for that experience. There is a relatively small, though expanding, body of research in this area; yet there is much that remains unknown regarding how these variables collectively influence one's memory for an event.

The focus of the present study was to examine and compare reports of memory clarity (judgments on phenomenological characteristics of memory) across emotionally distressing, emotionally positive, and neutral/non-emotional autobiographical events. The findings will have implications for the general understanding of emotion's association with memory, especially because affective responses at the time of the event have been

found to influence memory recall (see Christianson, 1992). Specifically, this research has implications in the forensic arena because our justice system includes recollections about, and often requires numerous retellings of these emotional, sometimes 'traumatic', criminal events. It is therefore important to uncover not only relationships between types of emotional events and memories, but also the role of individual personality differences in the resulting memory. Such factors include dissociative states of consciousness (e.g., depersonalization, derealization, dissociative amnesia) and residual psychological distress (e.g., posttraumatic stress symptoms). Therefore, in addition to an exploration of associations between phenomenological aspects of memory for particular emotional and non-emotional events, the present study investigated psychological reactions to those events, as well as more stable individual personality variables.

### *Emotional Autobiographical Memory*

#### *Evidence that Arousing Events Enhance Memory*

As mentioned, the nature of traumatic memories is at the centre of a controversy in the scientific and clinical communities. Empirically inconsistent findings have sparked a great deal of debate in the conceptualization of emotional/traumatic memory. Supporting one side of the debate, a body of research has yielded findings indicative of trauma's facilitative effect on memory. For example, Thompson, Morton, and Fraser (1997) compared archival data on survivors' accounts of a pleasure-liner sinking. Both legal and clinical statements (taken between four and seven months after the disaster) were used to verify statements across participants. The authors reported an 80% rate of confirmation between the survivors' accounts, and only 3 of the 27 participants claimed

any memory gaps for aspects of the event. Further, because their accounts in terms of word length did not differ from those claiming full memory, one might conclude that they did not evidence poorer overall recall. Notably, this study was one of the first to include a control/comparison event in the form of a descriptive account for a neutral event (a post-seminar dinner). The authors illustrated a variety of blatant inconsistencies and non-reporting of unusual happenings during this event, showing that people can err in their recollections of neutral events. Unfortunately, the accounts of the neutral event and the traumatic event were from different groups of participants (i.e., a between-subjects design), and the authors did not examine quality/quantity of detail in the accounts of the neutral events (i.e., they were purely descriptive).

More recently, Peace and Porter (2004) examined qualities and consistency of traumatic memory in a community sample. Participant's consistency scores, from assessments approximately three months apart, were significantly higher for traumatic than for positive events. Specifically, traumatic memories were more consistent in terms of vividness/clarity, quality of memory, and amount of detail provided, with the same qualities of positive memories actually decreasing over the two testing sessions. These data clearly support the superiority of traumatic memory claim, but only if these self-selected events did not differ on other criteria such as recency and rehearsal. The authors did address recency, and found that the positive and traumatic memories were not significantly different in age. This however, was clearly due to the instructions to recall a positive event in the past year, and the study's selection criteria of having experienced a 'traumatic' event within the same time period. With regard to rehearsal of the event, however, the authors did not include any assessment of rehearsal frequency. This factor is

commonly known to be strongly associated with memorial representation of that event (see Read & Connolly, 2005). Thus, when using a methodology involving self-selected memories (and especially self-selected participants), the assessment of such factors is critical to interpretation of the study's results.

*Evidence that Arousing Events Impair Memory*

In contrast, a number of studies support the perspective that trauma impairs memory (i.e., the 'traumatic memory argument'). For instance, in a study by Mechanic and colleagues (1998), rape victims' memories for the sexual assault event were assessed at two time periods separated by approximately three months. Thirty-seven percent of the victims claimed amnesia for parts of the rape. Darves-Bornoz (1997) also conducted a study investigating post-rape symptoms. Psychogenic amnesia for the rape was diagnosed in 44% of the participants via the structured clinical interview for the Diagnostic and Statistical Manual of Mental Disorders' dissociative disorders (DSM-IV; American Psychiatric Association, 1994). A well-known study conducted by Southwick, Morgan, Nicolaou, and Charney (1997) assessed the memory consistency of Desert Storm war veterans. They found that many of the participants changed their answers or seemed to 'forget' certain essential details when re-assessed two years later. In this study, inconsistencies were also of the form of added information; that is, some participants reported an event during the second interview that they had not previously reported.

It is interesting to note that studies supporting the impaired traumatic memory argument contradict the existence of a type of vivid memory, first termed 'flashbulb memories' by Brown and Kulik (1977). The 'special mechanism' for the creation of detailed memories for surprising, significant and emotionally-laden events (e.g., the



Kennedy assassination) has since been reconceptualized (see Conway, 1996). For example, studies such as that conducted by Byrne and colleagues (2001) found that survey ratings for positive, negative and traumatic autobiographical events differed. In their study, positive experiences were better recalled in terms of sensory and narrative information than were negative and traumatic experiences. Relating these findings to the flashbulb memory theory specifically, both traumatic and positive memories received similar ratings in terms of emotional intensity. In addition, the traumatic memories were rated as more important than the positive memories. We would expect, therefore, that the former would have been likely to produce memories that were more accurate and complete, yet this was not the case. Although they acknowledge that comparisons to neutral/non-emotional experiences are needed to make more valid comparisons as to the nature of 'flashbulb' memories, the authors interpret their findings in such a way as to support a more limited memory for traumatic experiences. This is interesting as all three types of memories received comparable ratings with regards to vividness, detail and accuracy-confidence in the memories. During only a brief review of the literature, diverse findings within emotional, autobiographical memory studies are often observed.

#### *Mixed Findings on the Relationship between Arousing Events and Memory*

There have also been a number of studies that have produced mixed results; that is, these studies show a variable association between trauma and memory. Wagenaar and Groenweg (1990) assessed the memory consistency of Nazi concentration camp survivors some 40 years later. As did Southwick et al. (1997), Wagenaar and Groenweg found that many of the participants seemed to forget specific details of their captivity on re-assessment. It also appeared that severity of the negative experiences was not

differentially associated with recall. It is important to note that re-assessments occurred an average of forty years after the participants' release from Camp Erika. This is a substantial amount of time, especially in contrast to the majority of memory consistency studies. The authors concluded that despite such occurrences of 'forgetting' names and appearances of captors, for example, that the survivors' memories for their time in captivity were reported as generally detailed and consistent.

In a study conducted by Tromp and colleagues (1995), participants' unpleasant memories received higher ratings on a number of phenomenological features (e.g., vividness, clarity, visual detail, etc.) than did their pleasant memories. It is interesting to note however, that in this study, participants' rape memories received higher phenomenological ratings than did their pleasant memories, but lower ratings than their generally unpleasant memories. Unfortunately, this study failed to assess for any personological variables that may have been related to memory judgments.

In Cooper's (1999) investigation of prostitutes' memories for their assault experiences, a number of individual differences were taken into account. Although the general physical assault, sexual assault, and positive memories reported did not differ in terms of the amount of detail, there was extreme variability in the quantity of recalled information across the three types of events. This suggests that within each type of memory participants' recall ranged from extraordinarily detailed to roughly outlined. Consistent with both the Mechanic et al. (1998) and Darves-Bornoz (1997) investigations, participants reported experiencing state dissociation during their traumatic events, as well as elevated post-event symptoms of *posttraumatic stress disorder* (PTSD; APA, 1994), a type of anxiety disorder that will be discussed further in subsequent

sections. These individual difference variables, however, were not found to be related to amount of detail provided.

Also lending support to both arguments is Porter and Birt's (2001) study with university undergraduates. They found participants' traumatic memories, and specifically the memories with a more severe subjective impact, showed greater emotional information and amount of detail than did their positive memories. They also found however, that traumatic memories were recalled with fewer sensory components, while they were equivalent to positive memories in terms of vividness, coherence, and memory quality. Although the traumatic memories were recalled with fewer sensory components, the authors interpret their results overall as support for the trauma superiority argument. In terms of potential memory-influencing variables, post-trauma symptoms were not related to quantity of detail, but were positively related to memory vividness. They did find that reports of high-impact traumas were associated with higher levels of trait dissociation; however, it is impossible to establish directionality in such cases.

Whether they have supported the trauma superiority argument, the traumatic memory argument, or do not clearly support either viewpoint, studies collectively indicate that no straightforward relationship exists between emotion/trauma and memory. Indeed, there are strong indications across studies that a multitude of personological variables combine to produce a unique effect on each individual's memory for a subjectively distressing event.

Overall, such conflicting findings have been the basis for the ongoing debate as to the nature of traumatic memories (e.g., McNally, 2003) and the differences in recall for facts and phenomenological characteristics between traumatic and other types of

memories (e.g., pleasant memories). As outlined above, some research suggests that the subjective element of trauma in an autobiographical event leads to memory impairment for that event. At an extreme, it has been argued that the experience of trauma can lead to complete or partial amnesia for the event (for discussion see Read, 1999). However, research involving soldiers exposed to combat situations generally show that while they may indeed forget certain details or create a script memory for their battle experiences, they do not forget their combat experiences altogether. Likewise, it is now recognized that an inability to recall having experienced childhood sexual abuse is an extremely rare occurrence (Read & Connolly, 1999), although details are often missing and separate events confused with one another. The validity of the construct of repression and indeed the 'recovered' memories that surface years later have all but been debunked by the scientific community (Lindsay & Read, 1994, 1995; Read & Lindsay, 1997). Although a small number of clinical cases have been presented attesting to the existence of this phenomenon (see Yuille & Daylen, 1998), the predominant direction of findings with victims of violence, war, and natural disasters is towards the greater clarity and consistency of traumatic memories (e.g., Golier, Yehuda, & Southwick, 1997; Pope, Hudson, Bodkin, & Oliva, 1998). This latter position in the debate has been strengthened by the fact that many field studies have supported the traumatic superiority argument (see Porter & Birt, 2001) and that there seems to be stronger scientific research supporting this case (Lindsay & Read, 1995).

Regardless of the theoretical orientation taken in interpreting the effects of trauma on memory, it is becoming clear that there are a number of potentially influential individual difference variables that have been empirically neglected in most of the

previous studies. For instance, Darves-Bornoz (1997) found that 84% of the dissociative disorder diagnoses were given to rape victims who were also diagnosed with PTSD at six months post-rape. These results are not unlike those of Mechanic et al. (1998) where elevated levels of dissociative states and PTSD in rape victims appeared pathological. As is indicated by such studies, it is possible that memory impairments are associated with such personological factors. These types of variables were investigated in the current study, and will be further outlined below.

### *Dissociation*

Dissociation is typified by cognitive disturbances and extreme emotional reactions. This involves a separation of information, memories, and emotions that would normally be integrated in consciousness (APA, 1994). Dissociation has been conceptualized as a state (i.e., *state, or peritraumatic, dissociation*) manifesting as an altered state of consciousness that may occur at the time of a subjectively disturbing event (Marmar, Weiss, & Metzler, 1997; Marmar et al., 1994). In contrast, other researchers have conceptualized dissociation as a constitutional predisposition (a trait; Kihlstrom, Glisky, & Angiulo, 1994) that may be related to the presentation of psychological distress in response to a triggering event (see Gershuny & Thayer, 1999). However, dissociation is likely better viewed as an extreme and rare reaction (i.e., a state) to experiencing an extreme event. For example, Halligan and Yehuda (2002) found that in offspring of Holocaust survivors, dissociative symptoms were elevated only in those with current PTSD (as opposed to past PTSD, or those with a risk factor for PTSD). Should dissociation be an enduring trait, dissociative symptoms would likely be present in those who develop PTSD even after their PTSD symptoms had abated. Further,

dissociative symptoms were associated with forms of psychopathology including, but not limited to, PTSD. For these reasons, Halligan and Yehuda interpret their findings as support for dissociation-as-state, rather than as an enduring trait.

The existence, direction, and strength of the connection between dissociation and trauma have been controversial in the dissociation literature. Nonetheless, dissociative experiences, particularly in response to a traumatic experience, are not uncommonly reported. Putnam (1995) reported more than 25 studies comparing pathological dissociation in traumatized and non-traumatized samples. Spiegel (1991) reported that 25 to 50% of trauma victims experience detachment during the traumatic episode, subsequent to it, or both. It is not known, however, if any of these samples were assessed for or met diagnostic criteria for PTSD. All of these studies reported findings of significantly higher levels of dissociation in the traumatized, compared to the non-traumatized, samples (also see Merckelbach & Muris, 2001).

Some have found that reported memory quality was related to negative emotions/affect experienced during events (see Christianson, 1992). State dissociation seems to be an important individual difference factor related to memory quality, as it specifically has in some cases been linked with subsequent memory impairments for that event (e.g., Mechanic et al., 1998; Spiegel & Cardena, 1991). As the Darves-Bornoz (1997) and Mechanic et al. (1998) studies have shown, one extreme of dissociation is reported complete or partial amnesia for the event itself (see Porter, Birt, Yuille, & Hervé, 2001). The validity of state dissociation is highly debated in the literature, across scientists and practitioners alike. Research with eyewitnesses to severe violence suggests that vivid recollections, rather than significant impairments, characterize memories of

those involved in the violent event (Porter et al., 2001). Although dissociative amnesia is recognized in the current DSM-IV (APA, 1994) it is prudent to consider this a rare phenomenon (Cima, Merckelbach, Nijman, Knauer, & Hollnack, 2002).

State dissociation can be experienced in a number of ways (Kihlstrom et al., 1994). Depersonalization is a particular form of state dissociation wherein there is a discontinuity in the perception of self, as if unreal or fundamentally changed. The DSM-IV (APA, 1994) defines depersonalization as “an alteration in the perception or experience of the self so that one feels detached from, and as if one is an outside observer of, one’s mental processes or body.” Whereas in normal perception events are viewed from a person’s own standpoint, known as the *field perspective* (Nigro & Neisser, 1983), in an extreme form of depersonalization, a person takes a variation in perspective known as the *observer perspective*. This perception is experienced as if the person is watching himself or herself, as if viewing events from an outsider’s standpoint (Yuille & Daylen, 1998). It is argued that such perceptual alteration is adopted as an initially adaptive manoeuvre to detach oneself from extreme stress and negative emotions evoked by the event (Spiegel & Cardeña, 1991). Anecdotal reports of such ‘out-of-body’ experiences have been reported. For example, during captivity, hostages reported symptoms of dissociation, which included feelings of being distanced from their bodies (Hillman, 1981; Spiegel & Cardeña, 1991).

#### *Perspective and Memory During a Subjectively Distressing Event*

Perspective is a salient feature of how an event is perceived. Although previous researchers have asked participants to recall their perspective at the time of the event, previous studies examining perspective have instead tended to focus on perspective as a

feature of the phenomenology of remembering (discussed below). Therefore, there is a need to extend investigations concerning perspective-taking to people's reports of perspective during the original experience. In field research with prostitutes, Cooper (1999), and Cooper, Yuille, and Kennedy (2002) found a higher number of reported observer perspectives (than field perspectives), during traumatic events, compared to positive events and sexual assault events. In addition, those who reported having taken an observer perspective during a sexual assault recalled significantly more details than those who reported having taken a field perspective. There were no significant differences however between perspective and reported details in the participants' traumatic and positive experiences. Additionally, these studies examined state and trait dissociation as related to perspective at the time of an event. Those prostitutes who reported taking an observer perspective during their experiences of sexual assault, trauma, and even during positive events, reported significantly higher levels of state dissociation compared to those who reported taking field perspectives. Similarly, Cooper and colleagues (under review) found in a sample of incarcerated male offenders that 24% of the sample reported observer perspectives during their index offense (i.e., most recent offense). Those who took an observer perspective reported higher levels of state dissociation compared to those who took a field perspective. The above studies were based on participant's retrospective reports of autobiographical events; therefore, it is important to recognize that they may not necessarily reflect the actual experience during the event. Memory is acknowledged to be reconstructive, not reproductive, and discrepancies between perspective at the time of the event and in memory for that event are compelling evidence of such reconstructions.



*Perspective and Memory After a Subjectively Distressing Event*

The few empirical studies on perspective have primarily focused on reported perspective in personal memories; that is, the perspective reported when ‘visually’ remembering autobiographical events (e.g., Frank & Thomas, 1989; Nigro & Neisser, 1983; Robinson & Swanson, 1993). Nigro and Neisser (1983) conducted the first experimental study to examine perceptual modes of remembering. They found empirical support for the idea that situations provoking higher levels of self-awareness (e.g., running from a threatening situation) resulted in more observer than field memories, as did experimenter instructions to recall objective details from the memory. Conversely, recall of neutral-affect situations (e.g., running for exercise) and instructions to recall event-related emotions resulted in more field memories (also see Robinson & Swanson, 1993). More recently, D’Argembeau, Comblain, and van der Linden (2003) found that both positive and negative memories were more often recalled with a field perspective than were neutral memories. Incidentally, this is the only study identified in the area to consider the relationship of personality attributes (i.e., anxiety and defensiveness) to memory characteristic ratings (e.g., sensory details, emotionality, setting), but there were no significant findings in that regard. Unfortunately, perspective was not investigated in relation to memory quality. Porter and Birt (2001) also found that traumatic memories were more often recalled with a field perspective than were positive memories, but perspective was not investigated in relation to any other variable (e.g., memory quality, dissociation). Talarico and Rubin (2003) investigated the field/observer distinction as an aspect of their flashbulb memory study for the 9/11 attacks in the U.S. At the initial assessment, participants’ were more likely to have a field perspective (rather than an

observer perspective) for the neutral memory than the flashbulb memory of learning about the attacks. Over time, however, participants were more likely to report observer perspectives for the neutral memory than the flashbulb memory. Consistent with Nigro and Neisser's (1983) findings, recollections of seeing an everyday event from the observer perspective increased over time. Overall, observer perspectives at the time of the event and in memory are reported less frequently than are field perspectives, regardless of the type of event (i.e., positive, negative).

Unfortunately, most studies in this area have not directly examined memory characteristics (i.e., quality/quantity of detail) of these two perspectives. Those findings that do exist are sparse and are unclear. McIsaac and Eich (2002) reported that neutral memories recalled from either perspective were equally accurate, but participants who reported field memories also reported more information on personal experience indicators (such as physical sensations, affective reactions, and psychological states) whereas those who had observer memories reported more objective details such as actions, appearance, and spatial relations. In a further study with persons who met the diagnostic criteria for PTSD, McIsaac and Eich (2004) found no differences between perspectives in the participants' reports of perceived richness of detail for traumatic memories. Field perspective memories (compared to observer perspective memories) were reported as more emotional and anxiety-provoking, and included more information about affective reactions. Observer perspective memories, in contrast, included more information about spatial relations and peripheral details. Neither study included a within-subjects comparison memory. Clearly, more research is needed to elucidate the influence of perspective, both at event and at recall, on memory.

Dissociative states of consciousness (e.g., depersonalization, derealization, dissociative amnesia) are recognized in the clinical and experimental literature as possible outcomes when people are exposed to some type of extremely distressing incident. The burgeoning psychological literature in this area is largely comprised of studies relating dissociation to trauma and extreme stress, and later development of PTSD in both clinical and non-clinical populations. In addition to state dissociation as a potential variable related to memory quality for a distressing event, PTSD has also been found to have associations with memory quality.

#### *Posttraumatic Stress Disorder Symptoms*

The lifetime rate of PTSD in the general population has been estimated at 1% (Helzer, Robbins, & McEvoy, 1987). Estimates of the percentage of general trauma/crime victims who subsequently develop PTSD have primarily been between nine and 12% (Norris, 1992; Putnam, 1995; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993). PTSD is an anxiety disorder comprised of three distinct symptom clusters: re-experiencing symptoms (e.g., intrusive recollections of the traumatic event), avoidant symptoms (e.g., efforts to remove thoughts of the trauma from conscious awareness), and hyperarousal symptoms (e.g., hypervigilance). Experiencing certain of these PTSD symptoms more than others may have differential associations with memory. For instance, the repeated reliving of the traumatic experience may lead to 'rehearsal' of the details. In this way, intrusions could be thought of as analogous to the frequency of recalls of the event. As previously mentioned, the frequency of recall (e.g., discussion of the event) is known to influence the strength of that memory, and is one post-event cognitive activity that can enhance memorial representation of that event (see Read &

Connolly, 2005). Thus, intrusive thoughts of the specific event may be a type of rehearsal process that leads to more retention of memory details (Scrivner & Safer, 1988; Yuille & Daylen, 1998). Alternately, consciously trying to push the event out of one's awareness may lead to poor recall of memory details (Cooper, 2004). Wegner (1989, 1994), however, has suggested that attempts at cognitive avoidance may in fact lead to an opposite result. Thought avoidance could lead to a kind of rebound effect which results in an increase in thinking of the disturbing event. Wegner posits that the interaction between an operating process, whose purpose is to locate distracting thoughts to remove the unwanted thought from consciousness, and a monitoring process, whose purpose is to examine the effectiveness of the operating process, actually pairs the distracting thoughts with the unwanted thoughts. This leads to the opposite of the desired outcome: increased frequency of the unwanted thoughts (but see Anderson & Green, 2001 for a contrary argument).

There seems to be a theoretical divide in the literature in terms of the association between PTSD and memory for a traumatic event. From the *disintegration view* (primarily supported by clinical observation), PTSD is conceptualized as a disorder of autobiographical memory; that is, trauma memories are incompletely processed and poorly integrated into a person's self-concept. From the contrasting *landmark view* of traumatic memories (primarily supported by the non-clinical autobiographical memory literature), highly emotional events (such as trauma) may aid in forming a 'landmark', or reference point, in attributing meaning to less salient personal experiences, thereby enhancing memory for the traumatic event. Traumas that are associated with the development of PTSD symptoms affect the organization and interpretation of

autobiographical memory to a greater degree than those not associated with PTSD symptoms (see Berntsen, Willert, & Rubin, 2003).

### *The Role of Personality Characteristics*

There is a growing body of literature indicating state dissociation as an antecedent to the development of PTSD (Bernat, Ronfeldt, Calhoun, & Arias, 1998; Marmar et al., 1994; Shalev, Peri, Canetti, & Schreiber, 1996). Candel and Merckelbach (2004) stress however that it is not appropriate at present to identify state dissociation as a risk factor for the development of PTSD, as some have done. Traits such as neuroticism (see Candel & Merckelbach, 2004) or fantasy proneness (see Merckelbach & Jelicic, 2004) may instead act as intervening variables that could account for the link between the two. Historically, the role of personality attributes has been generally neglected in the empirical trauma/eyewitness memory research. There are a few studies that have indicated that patterns of recall (e.g., remarkable memories, dissociative amnesia; see Yuille & Daylen, 1998) are related to personality characteristics (e.g., Mechanic et al., 1998; Thompson et al., 1997; Tromp et al., 1995). Research in the area of false memories suggests that high introversion scores (as measured by the NEO-FFI; Costa & McCrae, 1992) for example, are related to memory distortions (e.g., Porter, Birt, Yuille, & Lehman, 2000). As further studies increasingly uncover possible links between certain variables (e.g., dissociation, PTSD, neuroticism, fantasy-proneness), trauma/eyewitness memory research is slowly incorporating such individual difference factors into its lines of inquiry. Porter and Birt (2001), for example, found a relation between neuroticism and both dissociation and the subjective impact of a traumatic event. Unfortunately, relations between quality or quantity of memory and these personality factors were not examined.

One aim of the present study was to include personality factors in the overall examination of emotional memory.

### *The Present Study*

Through the study of memory for emotional and non-emotional events, a range of affective responses can be assessed and the associations between these responses and memory examined. The purpose of this study was to build upon past research in the area of emotional memory, namely that represented by Porter and Birt's (2001) line of inquiry. Previous studies in the area of emotional event memory (e.g., eyewitness memory, flashbulb memory, autobiographical memory) have overwhelmingly tended to choose positively valenced events to serve as the control/comparison, if they have included a comparison event at all. Consequently, very little is known about the comparison of recall for emotional events with neutral, non-emotional events. The present study was designed to speak to this deficiency in the autobiographical memory literature.

The aforementioned discrepancies in the findings concerning trauma's effect on memory likely relate to methodological differences across studies (e.g., divergent types of events studied, quality of information available) but are also likely to be a consequence of between-subject comparisons. As the current study elicited three different types of memories from each participant, the consequences of the latter methodological problem should be reduced. Autobiographical memory studies, especially those using undergraduate samples, have attempted to assess negative emotional memory by eliciting 'traumatic' experiences from participants. Although it has been found that subjectively disturbing, or 'traumatic' events, are fairly prevalent in college students (67%; Bernat et

al., 1998), it is uncertain if these events would qualify as a trauma in a clinical sense, and if direct comparisons between 'traumatic' events experienced by young adult undergraduates and those experienced by specific groups (i.e., sexual assault victims) are warranted. Also, studies eliciting a 'trauma' and a positive event indeed compare events that differ in their valence, but likely not in their emotionality, or arousal level. Therefore, to control for such levels, the present study elicited participants' 'most emotionally distressing' events and 'most emotionally positive' events.

Previous studies in this area have also tended to focus primarily on the accuracy or consistency of event details, rather than on participants' judgments of qualitative (phenomenological) characteristics of their emotional memories (e.g., vividness, clarity, emotional intensity). The role of individual factors has also been largely neglected with respect to subjective memory judgments. For instance, in the Porter and Birt (2001) study, phenomenological characteristics of memory for traumatic events and for emotionally positive events were investigated. Although a small number of other variables (e.g., PTSD, trait dissociation) were included in the study, these variables were not directly examined in relation to phenomenological characteristics of memory. The current study was the first to relate affect at event and at recall, state dissociation, perspective at event and in memory, PTSD symptoms, neuroticism, and fantasy-proneness to qualities of memories for emotional and non-emotional events.

#### *Hypotheses of the Present Study*

*Phenomenological characteristics of memory.* Based on previous research that compared traumatic to positive events, it was expected that subjectively distressing memories and positive memories would be reported as recalled with more clarity than

neutral memories. Further, it was hypothesized that distressing memories would be reported as recalled with more clarity than positive memories. Ratings of accuracy and confidence for detail questions (e.g., what the participant was wearing at the time, thinking/feeling at the time) were collected for each memory. It was expected that participants would report memory for distressing events as more accurate, and have more confidence in recollections of those memories than for the positive events, and that both of these memories would be judged as more confident and accurate than the neutral memories. Studies such as Talarico and Rubin (2003), for example, have shown that such confidence may be unwarranted, but that it does remain much higher for emotional than neutral events.

*Affect: Valence and arousal.* Reported arousal at the time of the distressing events was expected to be higher than for the positive events, and both the distressing and positive events to be higher than the neutral events. Following from this prediction, it was expected that higher levels of reported arousal both at the time of the event and currently (during recall) would be associated with reports of greater memory clarity. This was expected as findings from many autobiographical memory studies indicate emotional arousal improves memory, rather than impairs it (see Brewer, 1992).

*State dissociation.* Participants' reports of experiencing dissociation at the time of their distressing, positive, and neutral events were collected. It was predicted that a higher level of state dissociation would be reported during the distressing events, as compared to the positive and neutral events.

Reports of state dissociation for autobiographical events were investigated in relation to judgments of phenomenological characteristics of memory. Consistent with



the link between the experience of dissociation during a distressing event and memory distortion for that event, it was anticipated that higher levels of reported state dissociation would be negatively associated with memory clarity reports.

State dissociation levels during the distressing event were investigated in relation to their reports of subsequent PTSD symptoms for that event. It was anticipated that higher levels of state dissociation would be associated with higher levels of reported PTSD symptoms, consistent with the link previously reported in the literature.

*Perspective: The field/observer distinction.* Empirical studies on the field/observer distinction are scarce, and more importantly, no known studies have compared perspectives across experience and subsequent recall memory, a distinction that was therefore investigated in the present study.

It was anticipated that those who reported a higher level of observer perspective-taking at the time of the original experience and in the associated memory would have poorer memory clarity than those who reported more field perspective-taking. As phenomenological characteristics reflect subjective judgments of one's own memory, the hypotheses are consistent with previous studies that show recall through observer perspectives is objectively oriented, whereas field perspective recall is subjectively oriented (i.e., McIsaac & Eich, 2002).

The association between event/memory perspective and trait dissociation was also examined. It was expected that those who reported more observer perspective-taking both at event and in memory would have higher levels of trait dissociation. This is concordant with current theorizing and research (e.g., see Cooper, Dell, Yuille, & Boer, 2001; but also see Cooper et al., 2002).

*Posttraumatic stress disorder symptoms.* Reports on PTSD symptoms were collected in relation to the distressing events. It is important to note that these symptom reports do not constitute posttraumatic stress disorder. Symptom reports were used to examine how varied affective responses relate to participants' memory clarity.

Although the relation between dissociation and PTSD is the focus of a burgeoning literature, the relation between perspective and PTSD has been empirically neglected. It was anticipated that PTSD symptom reports would be higher for those who indicated a higher level of event and memory observer perspective-taking than those who indicated a higher level of field perspective taking.

No further *a priori* predictions were made regarding relationships between memory qualities and personality traits.

## Method

### *Participants*

Seventy-three undergraduates from Simon Fraser University participated in the current study on autobiographical memory for emotional and non-emotional events. Participants were recruited for the most part via the Simon Fraser University subject pool, and the undergraduates were given course credit for their participation. Other participants from the same age range were recruited from the community at large via word of mouth.

Thirty males and 43 females participated in the current study. The participants' mean age was 20.70 ( $SD = 4.00$ ; range: 18-41). Thirty-eight percent identified themselves as Caucasian, 48% as Asian and 14% as other ethnicities (e.g., Philippino, East Indian,

etc.) and approximately 60% indicated English as their first language. They reported an average of 13.25 years of education ( $SD = 1.43$ ; range: 12-18).

### *Procedure*

Participants were instructed to come into the lab to complete the study. After reading and signing the consent form, participants completed the questionnaire package regarding experiences and memories for three types of autobiographical events: a positive event, a neutral/non-emotional event, and a distressing event. Participants were directed to think about their experience for their most emotionally positive event, most emotionally distressing event and a specific neutral/non-emotional event. They were instructed to recall a recent event in each category (i.e., events that occurred in their adolescence/adulthood), as opposed to events from their childhood. Participants wrote a free narrative account of each event, and then provided answers to the event detail questions. The specific questionnaires were then completed. These were: ratings of phenomenological characteristics of memory (Memory Characteristics Questionnaire), arousal/valence at the time and currently, reports of field/observer perspectives at the time of the event and in memory, reports of state dissociation (Peritraumatic Dissociative Experiences Questionnaire – Self-Report Version), and ratings of subjective distress (Impact of Event Scale - Revised) in relation to the distressing event. After the questionnaires for all three memories were completed, the participants proceeded to complete questions assessing trait dissociation (Dissociative Experiences Scale), neuroticism (Big Five Inventory-44S), and fantasy proneness (Creative Experiences Questionnaire). Participants were debriefed after completion of the study and provided

with counselling services contact information should they have felt the need to discuss their disturbing events further.

Both event type (i.e., positive, neutral, distressing) and the personality trait questionnaires were completely counterbalanced. Four random orders were created for the event questionnaires.

### *Measures*

The measures used in the current study will be presented as follows: first, the questions and questionnaires pertaining to memory characteristics are presented, followed by those relating to affective reactions (i.e., dissociation, perspective, and PTSD symptoms). Next, the trait measures will be discussed: dissociative disposition, neuroticism, and finally, fantasy-proneness.

### *Memory questionnaires*

*Free narrative and detail questions.* Participants were instructed, in relation to the positive, neutral and distressing events, to write a free narrative description containing everything they could recall about the event in question. This helped to ensure that they were focusing on the specific remembered event. They gave two global ratings on seven-point scales (1 'not at all' to 7 'extremely') regarding memory accuracy and another for memory confidence. They were then asked to give brief, but complete responses to a number of detail questions, including "Do you remember what the weather was like?" "Do you remember what you were wearing?" While the narratives describe the more central event proceedings and details, these questions arguably tap into some of the event details. They then made two ratings on seven-point scales (1 'not at all' to 7 'extremely')

for each of these peripheral details: one for accuracy and one for confidence in the reported detail.

*Memory clarity: Memory Characteristics Questionnaire (MCQ).* Johnson, Foley, Suengas and Raye's (1988) self-report questionnaire assesses the phenomenological qualities of memory for a specific event. The 39 items assess cognitive qualities of memory such as vividness and coherence. Responses to items such as "The overall vividness for my memory for this event is" and "My memory for the location where the event takes place is" are formatted on a seven-point Likert scale ranging from one (a vague memory for an event), to seven (a clear distinct memory for an event). In the present study, responses to the MCQ items were summed to a total score which will be referred to as 'memory clarity'. Higher total scores reflect greater memory clarity for the event in question. The MCQ's psychometric properties have not to date been reported in published psychological literature despite its wide use.

#### *Affective Responses Questionnaires*

*Arousal level and valence: Affect Grids.* An Affect Grid is a two-dimensional measure of arousal and valence (Russell, Weiss, & Mendelsohn, 1989). This grid assesses dimensions of arousal (high arousal/sleepiness) and valence (unpleasant/pleasant feelings) on two scores. The arousal-sleepiness arousal score ranges from one (sleepiness) to nine (high arousal). The pleasure-displeasure valence score also ranges from one (unpleasant feelings) to nine (pleasant feelings). The Affect Grid has general instructions that can be adapted to the goals/needs of a specific study. For the current study, participants placed a single X on the grid to reflect their arousal and valence at the time of each event. They also made ratings for their current arousal and valence during

recall for each event. Russell et al. (1989) have reported good inter-rater reliability, split half reliability, and both convergent and discriminant validity for the Affect Grid.

*Dissociative experiences during the event: Peritraumatic Dissociative Experiences Questionnaire-Self-Report Version (PDEQ-SRV).* Marmar et al. (1997) developed this 10-item, five point Likert scale questionnaire ('not at all true' to 'extremely true') that assesses state dissociative symptomatology for a specific remembered event. Items include "What was happening seemed unreal to me, like I was in a dream or watching a movie or play" and "I felt as though I were a spectator watching what was happening to me, as if I were floating above the scene or observing it as an outsider" Elevated scores reflect an elevated experience of state dissociation at the time of the experience. The PDEQ is used often in both research and clinical settings, and has been found to be both reliable and valid (e.g., internal consistency ranging from .75-.85; test-retest reliability of .85; intraclass correlation coefficient of .85; for review, see Marshall, Orlando, Jaycox, Foy, & Belzberg, 2002). In addition, it has strong associations with factors such as PTSD symptoms (Marmar et al., 1994; for review, see Marshall & Orlando, 2002) and general dissociative tendencies (e.g., Marmar et al., 1997).

*Perspective-taking: Field versus observer distinction at the time of the event.* A number of previous studies have dichotomized participants as having taken a field or observer perspective based on their answers to question 5 on the Peritraumatic Dissociative Experiences Questionnaire-Rater Version (Marmar et al., 1997) – "Were there moments when you felt as though you were a spectator watching what was happening to you – for example, did you feel as if you were floating above the scene or observing as an outsider?" In the current study, perspective at the time of the event was

assessed on a 7-point scale with 'field' and 'observer' as the anchor points. To my knowledge, only one study to date has measured perspective-taking at the time of the event as a continuous measure (i.e., Talarico & Rubin, 2003). Participants also reported as percentages how much of the event they experienced from field and observer perspectives.

In a pilot study test of participant's ability to understand the 7-point scale and to assess its relationship with the PDEQ perspective question, participants who reported more observer perspective taking on the 7-point scale also endorsed observer perspectives on the PDEQ.

*Perspective-taking: Field versus observer distinction in memory.* A scale identical to that used for perspective at the event was used to assess the degree of field/observer perspective-taking in memory for the events in question. Like perspective at event, the field/observer distinction in memory has also typically been studied as a dichotomy - participants are typically classified as having either a field or an observer perspective during the event in question. In the current study, perspective was assessed on a continuous scale to assess field/observer perspective-taking in memory for the event. Participants also reported on how much of the memory they experienced as field/observer, reported as percentages.

*Posttraumatic stress symptoms: Impact of Event Scale-Revised (IES-R).* The Impact of Event Scale-Revised (Weiss & Marmar, 1997) is a 22-item self-report measure of subjective distress in relation to a particular autobiographical event. This scale assesses the degree of distress of each symptom of the three core components of PTSD (intrusions, avoidance, and hyperarousal) over the past seven days. Ratings are made on a

five-point Likert scale (“0 = not at all” to “4 = extremely”). The IES-R was administered in relation to the disturbing event only. The IES has high internal consistency (using Cronbach’s Alpha, intrusion = 0.91, avoidance = 0.84, and hyperarousal = 0.90), and test-retest reliability (intrusion = 0.94, avoidance = 0.89, and hyperarousal = 0.92; Weiss & Marmar, 1997). The advantage the IES-R possesses in yielding a continuous measure of the frequency of all three symptom clusters is that the presence of sub-clinical PTSD can be evaluated.

### *Personality Trait Questionnaires*

*General dissociative experiences: Dissociative Experiences Scale (DES).* The 28-item DES (Bernstein-Carlson & Putnam, 1993; Bernstein & Putnam, 1986) is a trait measure of dissociation, which yields a score from 0-100 indicating the extent of dissociative experiences across the person’s life. It requires participants’ answers (selecting from 0% to 100% of the time) to represent their experiences when not under the influence of drugs or alcohol. Items include “Some people have the experience of driving or riding in a car or bus or subway and suddenly realizing that they don’t remember what has happened during all or part of the trip”, and “Some people have the experience of not being sure whether things that they remember happening really did happen or whether they just dreamed them.” Participants then circle the percentage of the time that this happens to them. An average is then calculated to form one global score. Test-retest reliability has ranged from .84 to .96, and split-half correlations have ranged from .83 to .93 (Bernstein & Putnam, 1986). Internal consistency has been found to be .95 (Frischholz, Braun, & Sachs, 1990; see Bernstein-Carlson & Putnam, 1993, for review).



*Personality characteristics: Big Five Inventory-44S (BFI-44S).* John and Srivastava's (1999) 44-item self-report questionnaire assesses the 'Big Five' personality characteristics of extraversion, agreeableness, conscientiousness, neuroticism and openness to experience. Participants indicate from one (strongly disagree) to five (strongly agree) if they see themselves as someone who "is relaxed, handles stress well," "values artistic experiences," "can be moody," and the like. The Big Five inventory has been found to have a Cronbach's alpha of .83 for neuroticism (King, Walker, & Broyles, 1996). There are eight items on the neuroticism scale in particular, which was of interest to the current study. Higher scores on this scale reflect a stronger representation of this trait.

*Fantasy-proneness: Creative Experiences Questionnaire (CEQ).* Merckelbach, Horselenberg, and Muris (2001) constructed this 25 item self-report measure of fantasy proneness. Yes or no responses on items such as "I could very easily identify with the main character of a story or movie" and "I can recall many occurrences before the age of three" assess developmental aspects, involvement in, and consequences of daydreaming. Yes answers are summed to a maximum of 25. Higher scores are indicative of higher levels of fantasy proneness. The CEQ has demonstrated sound internal consistency (Cronbach's alpha = 0.72) and test-retest reliability ( $r = 0.95$ ; Merckelbach et al., 2001).

## Results

### *Types of Memories Provided*

All participants provided three different types of memories, as the study requested. The memories of positive experiences were classified into the following

categories based on the narrative descriptions the participants provided: hearing good news (26.0%); being with family/friends (19.2%); going on/being on a trip (16.4%); winning an event (e.g., sports; [12.3%]); high school graduation (12.3%); the remaining 13.8% included events such as birth of a child, being with a partner, and attending a wedding. The memories for neutral/non-emotional experiences the participants provided were classified into the following categories: school related (30.1%); driving or travelling (23.3%); being with friends (15.1%); shopping (5.5%); the remaining 26% included events such as playing sports, being with family members, and visiting the dentist. The memories of distressing experiences the participants provided were classified into the following categories: hearing of someone's death (24.7%); hearing (other) bad news (17.8%); being present in a medical emergency (15.1%); having a fight with partner/family member (8.2%); the remaining 34.2% included events such as being in a physical fight, being involved in a car accident, and having a negative sexual experience. The means, standard deviations and ranges for all memory characteristics and questionnaires included in the study can be found in Appendix 1. Immediately below, Table 1 presents means for the reported age of the memories, estimates on the number of verbal recalls, and the narrative word length for the memories provided.

Table 1: Means and Standard Deviations (in parentheses) for Age of Memory, Number of Verbal Recalls, and Narrative Word Length by Event Type

	Positive event	Neutral event	Distressing event
Age of memory in months	25.26 (30.04)	6.15 (12.63)	32.40 (36.70)
Number of verbal recalls	8.10 (16.87)	1.22 (2.20)	7.49 (16.36)
Narrative word count	73.92 (39.89)	56.52 (33.14)	81.71 (39.70)

### *Counterbalancing*

As event type (i.e., positive, neutral, distressing) and the personality questionnaires (i.e., DES, BFI-44S, CEQ) were completely counterbalanced, any variability due to order effects was assumed to be relatively evenly distributed across participants.

Repeated measures ANOVAs were conducted to uncover any order effects for the event questionnaires (i.e., MCQ, PDEQ-SRV, perspective questions, Affect Grids, IES-R). None of these yielded significant results, indicating that there were no order effects of event questionnaires.

As the personality questionnaires always followed the event questionnaires, a MANOVA was conducted to uncover any possible effects of event questionnaire order on the personality measures. This yielded no significant results, indicating that event questionnaire order did not have an impact on responses to the personality questionnaires.

*Missing Data*

For variables that had missing data, a dummy variable was coded and independent t-tests were conducted to determine if there was a significant difference on a related dependent variable between those who did and did not provide a response. None of these analyses were significant. Missing data were then replaced with the variable mean for subsequent analyses.

For the following analyses, alpha levels were set at .05. In the case of mean comparisons, a Bonferroni adjustment was used to control the family-wise error rate. Where appropriate, statistical analyses concerning differences in a variable across events involved repeated measures ANOVAs or MANOVAs, and all ANOVAs incorporated Huynh-Feldt corrected F-values. In the remaining instances, bivariate Pearson correlations were calculated to show the relationship between variables across all three events.

*Reliability Check: MCQ Total Scores*

As no known study has reported the MCQ's psychometric properties, a reliability check was conducted on the MCQ total scores for each of the three event types. Cronbach's alphas were .88, .91, and .91 for the positive, neutral, and distressing events, respectively, which indicates good reliability of the measure.

*Manipulation Check: Valence*

As a manipulation check, decreasing negative valence was expected across the distressing, neutral, and positive events, in that order. To examine this, a repeated measures ANOVA was conducted on the 'at event' valence scores on the Affect Grid

across the events (lower scores reflect more negative affect). The test of within-subject effects was significant,  $F[2,144] = 287.05, p < .001$ . Multiple pairwise comparisons indicated that the distressing events were significantly more negative in valence than the neutral events,  $t(72) = 15.50, p < .001$ , and the positive events were significantly less negatively valenced than both the distressing,  $t(72) = -23.23, p < .001$ , and the neutral,  $t(72) = -8.81, p < .001$ , events (see Table 2).

Table 2: Means and Standard Deviations (in parentheses) for Valence by Event Type

	Positive event	Neutral event	Distressing event
Affect Grid valence 'at event'	7.90 (1.66)	5.66 (1.76)	2.03 (1.40)

Thus, the manipulation check was taken to be successful – participants reported more negative affect associated with their reported distressing memories, more positive affect with their positive memories, with the neutral memories receiving affect ratings between the two.

#### *Memory Clarity*

*Memory clarity, age of memory, recall history and narrative word count.*

Bivariate Pearson correlations (one-tailed) calculated on MCQ memory clarity total scores and ages of the memories were not significant for the positive ( $r = -.23, p > .05$ ) or the neutral ( $r = -.05, p > .60$ ) events, but was significant for the distressing event ( $r = -.29, p < .05$ ). A repeated measures ANOVA revealed significant differences between the ages of the memories provided,  $F[2, 141.46] = 19.85, p < .001$ . Multiple pairwise comparisons revealed that although the positive and distressing events did not

differ significantly, both of these events were older than the neutral events ( $t[72] = 4.75$ ,  $p < .001$ , and  $t[72] = 5.54$ ,  $p < .001$ , respectively). Therefore, a subset of the sample that did not significantly differ on age of memories provided was used to investigate differences in MCQ memory clarity total scores, as illustrated in Table 3 below. The repeated measures ANOVA test of within-subject effects was significant,  $F[2, 12.13] = 26.86$ ,  $p < .001$ . Multiple pairwise comparisons revealed that the positive events received significantly higher clarity ratings than both the neutral,  $t(42) = 6.88$ ,  $p < .001$ , and the distressing,  $t(42) = 2.02$ ,  $p < .001$ , events. Further, the distressing events received significantly higher clarity ratings than did the neutral,  $t(42) = 5.18$ ,  $p < .001$ , events. These findings mirror those of the total sample (see Table 4 below), which indicates that despite the differing ages of the memories, memory clarity is highest for the positive, then distressing, then neutral events, in descending order.

Correlations between MCQ memory clarity total scores and instances of verbal recall were not significant for the positive ( $r = .21$ ,  $p > .05$ ) or the distressing ( $r = .22$ ,  $p > .05$ ) events, but was significant for the neutral event ( $r = .28$ ,  $p < .05$ ). A repeated measures ANOVA revealed significant differences between the instances of verbal recall for the memories provided,  $F[2, 144] = 7.25$ ,  $p < .01$ . Multiple pairwise comparisons revealed that although the positive and distressing events did not significantly differ, they were both recalled significantly more times than the neutral events ( $t[72] = 3.44$ ,  $p < .01$ , and  $t[72] = 3.22$ ,  $p < .01$ , respectively). Therefore, as shown in Table 3, a subset of the sample which did not differ on instances of verbal recall was used to investigate differences in MCQ memory clarity total scores. The repeated measures ANOVA test of within-subject effects was significant,  $F[2, 66] = 10.41$ ,  $p < .001$ . Multiple pairwise

comparisons revealed that the positive events received significantly higher clarity ratings than both the neutral,  $t(33) = 4.84, p < .001$ , and the distressing,  $t(33) = 2.95, p < .01$ , events. Further, although the distressing events did not receive significantly higher clarity ratings than did the neutral events, it was in the direction consistent with that of the total sample (see below). As with memory age, these findings mirror those of the total sample. This indicates that despite the differing recall histories of the memories, memory clarity is highest for the positive, then distressing, then neutral events, in descending order.

As with the ages of the memories and verbal rehearsal of the memories, a repeated measures ANOVA revealed significant differences ( $F[2, 144] = 22.44, p < .001$ ) in the narrative word counts between the events. The written narratives for both the positive events ( $t[72] = 4.65, p < .001$ ) and for the distressing events ( $t[72] = 6.81, p < .001$ ) were significantly longer than those for the neutral events. A repeated measures ANOVA on a subset of the sample that did not significantly differ on narrative length revealed significant differences ( $F[2, 54.74] = 20.32, p < .001$ ) in MCQ memory clarity total scores (see Table 3). Multiple pairwise comparisons showed that as with the total sample, the positive events were recalled with more clarity than the neutral ( $t[29] = 7.06, p < .001$ ), and distressing ( $t[29] = 2.99, p < .001$ ) events. The distressing events were recalled with more clarity than the neutral ( $t[29] = 3.11, p < .001$ ) events. When the narrative word lengths were equated, memory clarity was highest for the positive, then the distressing, then the neutral events, in descending order.

Table 3: Means and Standard Deviations (in parentheses) for Memory Clarity by Event Type for Subsamples

Subsamples	MCQ total score		
	Positive event	Neutral event	Distressing event
Memory age (n = 43)	202.16 (24.84)	163.06 (32.98)	191.28 (28.70)
Verbal recall (n = 34)	192.56 (27.17)	166.57 (25.55)	173.15 (30.12)
Word count (n = 30)	202.67 (26.83)	158.60 (30.06)	183.70 (29.05)

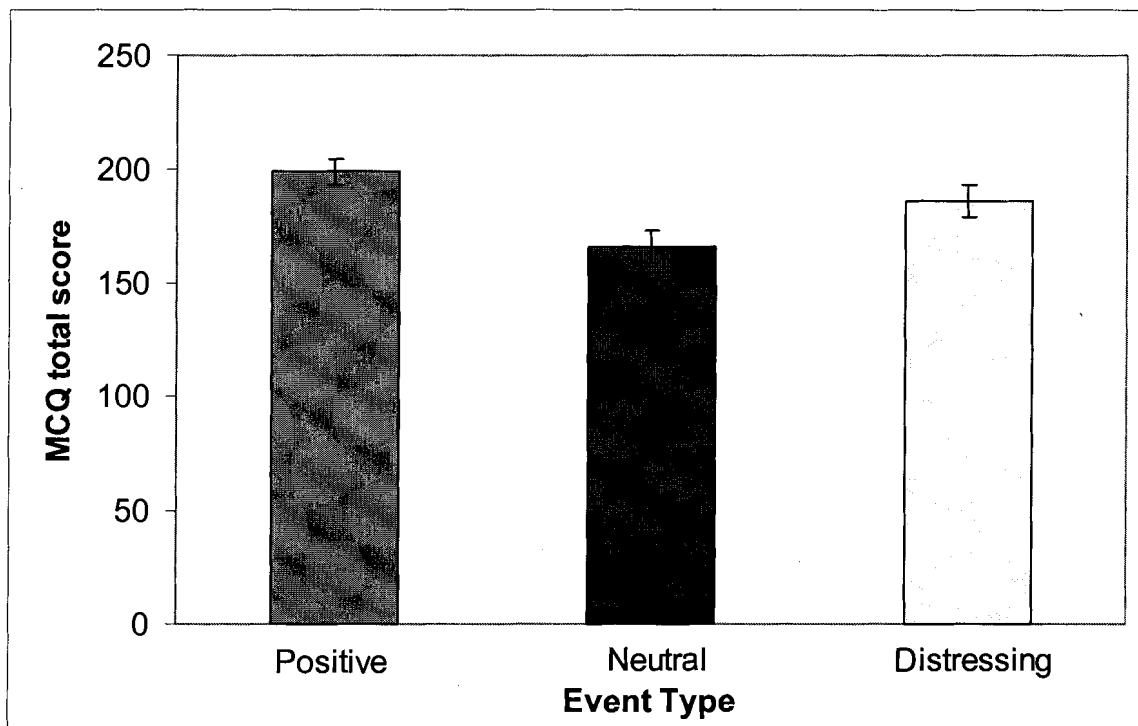
*Memory clarity across different events.* It was hypothesized that the distressing experiences would be reported as recalled with more clarity than would the positive experiences, and that both would be judged as recalled with more clarity than the neutral experiences. To test this hypothesis, a repeated measures ANOVA was conducted on the MCQ memory clarity total scores across events. The test of within-subject effects was significant,  $F[2, 143.69] = 32.89, p < .001$ . Table 4 illustrates the differences in mean MCQ scores, and multiple pairwise comparisons revealed that indeed the neutral event received significantly lower memory clarity ratings than both the positive,  $t(72) = -7.89, p < .001$ , and the distressing,  $t(72) = -4.67, p < .001$ , events. Interestingly, the positive event received significantly higher clarity ratings than the distressing event,  $t(72) = 3.38, p = .001$ . Figure 1 below also presents the mean scores, with 95% confidence intervals which illustrate the overlap of MCQ memory clarity total scores.



Table 4: Means and Standard Deviations (in parentheses) for Memory Clarity by Event Type

	Positive event	Neutral event	Distressing event
MCQ total score	198.71 (25.03)	165.29 (29.38)	185.86 (29.80)

Figure 1: Means and 95% Confidence Intervals for MCQ Total Scores by Event Type



*Memory clarity and personality.* As Table 5 shows, none of the bivariate Pearson two-tailed correlations between BFI-44S Neuroticism subscale scores ( $M = 24.49$ ,  $SD = 5.77$ ) and MCQ memory clarity total scores were significant; however it is interesting to note they are all in the negative direction. The association between MCQ memory clarity total scores and the personality trait of fantasy-proneness (CEQ total scores [ $M = 9.88$ ,  $SD =$

3.72]) was similarly investigated via bivariate Pearson two-tailed correlations. As seen in Table 5, the only significant correlation was for the positive event.

Table 5: Correlations between Memory Clarity and both Neuroticism and Fantasy-proneness by Event Type

	Positive event	Neutral event	Distressing event
BFI-44S neuroticism subscale	-.11	-.08	-.07
CEQ total score	.25*	.23	.12

\* $p < .05$

### *Memory Details*

The separate accuracy rating and confidence rating were averaged and collapsed into one ‘accuracy-confidence’ rating for each of the 11 memory detail questions due to the similarity on these two ratings. Thus, each participant had 11 accuracy-confidence ratings for each type of memory. A one-way MANOVA was conducted to determine the relationship between event type on the dependent variable of memory accuracy-confidence ratings for the 11 details reported. The results indicated that event type was significantly associated with (Wilks’  $\Lambda = .69$ ,  $F[11, 22] = 3.87$ ,  $p < .001$ ) memory accuracy-confidence ratings on the different memory detail questions. Follow-up tests revealed significant differences between event types for three of the 11 aspects of memory details. *Global accuracy-confidence* of the memory varied significantly by event type ( $F[2, 216] = 3.86$ ,  $p < .05$ ), with more accuracy-confidence in the positive events than the neutral events ( $p < .05$ ). *What they were wearing at the time* ( $F[2, 216] = 6.45$ ,  $p < .01$ ) varied by event type, with more accuracy-confidence in the positive events than

the distressing events ( $p < .001$ ), and more accuracy-confidence in the neutral events than the distressing events ( $p < .05$ ). *What they were feeling at the time* ( $F[2, 216] = 17.88, p < .001$ ) varied by event type, with more accuracy-confidence in the positive events than the neutral events ( $p < .001$ ) and more accuracy-confidence in the distressing events than the neutral events ( $p < .001$ ). Differences in accuracy-confidence ratings for *what they were thinking at the time* approached significance ( $F[2, 216] = 2.98, p = .053$ ), with more accuracy-confidence that approached significance in the distressing events than in the neutral events ( $p = .054$ ; see Table 6).

Table 6: Means and Standard Deviations (in parentheses) for Memory Detail Ratings of Accuracy-Confidence by Event Type

	Positive event	Neutral event	Distressing event
Global*	6.04 (.80)	5.63 (1.20)	6.02 (.98)
When event took place	5.66 (1.27)	5.73 (1.50)	5.24 (1.77)
Who was there	6.52 (.85)	6.26 (1.31)	6.63 (.80)
Where it took place	6.74 (.68)	6.69 (.61)	6.67 (.89)
Weather at the time	5.95 (1.64)	5.47 (1.80)	5.35 (1.85)
Wearing at the time**	5.71 (1.91)	5.36 (1.94)	4.54 (2.20)
Thinking at the time****	5.60 (1.56)	5.42 (1.56)	5.99 (1.24)
Feeling at the time***	6.30 (.94)	5.47 (1.42)	6.48 (.81)
Focus at the time	5.20 (1.74)	5.47 (1.55)	5.43 (1.76)
Influence of drugs/alcohol	6.32 (1.40)	6.34 (1.32)	6.48 (1.12)
Instances of verbal recall	5.57 (1.25)	5.83 (1.40)	5.66 (1.30)

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ . \*\*\*\*  $p = .053$ .

In summary, the findings indicate that as the age of the distressing event increased, the reported memory clarity for that event decreased, whereas the more reported verbal recollections of the neutral events, the higher the reported memory clarity for that event. Further, contrary to what was predicted, the positive events were recalled with more clarity than the distressing events. Consistent with predictions, however, both

the positive and the distressing events were recalled with more clarity than the neutral events. No significant association was found between memory clarity and neuroticism, and only memory clarity for the positive events was positively correlated with fantasy-proneness. Global accuracy-confidence received higher ratings for the positive than neutral events. More specifically, what they were wearing at the time accuracy-confidence received higher ratings for the positive than distressing events, and for the neutral than the distressing events. What they were feeling at the time accuracy-confidence received higher ratings for the positive than neutral events, and for the distressing than neutral events.

### *Arousal*

*Arousal across different events.* To examine any differences in arousal at the time of the events, a repeated measures ANOVA was conducted on Affect Grid 'at event' arousal scores across the events. The test of within-subject effects was significant,  $F[1.85, 168.44] = 42.44, p < .001$ . Table 7 presents the mean arousal scores, and multiple pairwise comparisons revealed that all three were significantly different from each other. Positive event arousal levels were greater than those for the neutral events,  $t(72) = 10.40, p < .001$ , and those for the distressing events,  $t(72) = 4.34, p < .001$ . Distressing event arousal levels were greater than those of the neutral events,  $t(72) = 4.43, p < .001$ .

A repeated measures ANOVA was conducted on Affect Grid 'currently' arousal scores across the events revealed significant differences across event types,  $F[2, 144] = 26.43, p < .001$ . Both positive event arousal levels,  $t(72) = 7.64, p < .001$ , and distressing event arousal levels,  $t(72) = 5.02, p < .001$ , were significantly greater than those for the

neutral events. Only the difference between the positive and the distressing events was non-significant,  $t(72) = 1.74, p > .05$  (see Table 7).

Table 7: Means and Standard Deviations (in parentheses) for Arousal by Event Type

	Positive event	Neutral event	Distressing event
Affect Grid arousal 'at event'	7.70 (1.36)	4.79 (2.01)	6.40 (2.40)
Affect Grid arousal 'currently'	5.65 (1.72)	3.92 (1.44)	5.20 (1.75)

*Arousal and memory clarity.* Relationships between Affect Grid 'at event' arousal scores and MCQ memory clarity total scores were examined via bivariate one-tailed Pearson correlations. The only significant correlation was for the positive events ( $r = .20, p < .05$ ). Similarly, the only significant correlation between Affect Grid 'current' arousal scores and MCQ memory clarity total scores was for the positive events ( $r = .29, p < .01$ ).

Concerning arousal, reported levels at the time of the event decreased across the positive, distressing, and neutral events. The positive events received higher 'at event' arousal ratings than the distressing events, which was inconsistent with expectations. That arousal ratings for both the positive and the distressing events were both higher than the neutral events was consistent with predictions. Generally consistent with the hypothesis concerning arousal and memory clarity, higher 'at event' arousal levels for the positive events were associated with more reported memory clarity. Arousal levels at recall were greater for both the positive and distressing events than the neutral events. Furthermore, higher positive events 'current' arousal levels were associated with more reported memory clarity.

*State Dissociation*

*State dissociation and age of memory.* Bivariate Pearson correlations (two-tailed) revealed that age of the neutral events was positively correlated with PDEQ-SRV state dissociation scores ( $r = .36, p < .01$ ).

*State dissociation across different events.* The test of within-subjects effects in a repeated measures ANOVA on PDEQ-SRV state dissociation scores across events was significant,  $F[1.90, 136.41] = 47.04, p < .001$ . Multiple pairwise contrasts revealed significant differences between all of the events: positive events dissociation levels were greater than those for the neutral events,  $t(72) = 2.94, p < .005$ ; distressing events dissociation levels were greater than those for both the positive,  $t(72) = 7.23, p < .001$ , and the neutral,  $t(72) = 8.31, p < .001$  events (see Table 8).

Table 8: Means and Standard Deviations (in parentheses) for State Dissociation by Event Type

	Positive event	Neutral event	Distressing event
PDEQ-SRV total score	18.60 (6.88)	15.75 (6.05)	25.64 (8.67)

*State dissociation and memory clarity.* One-tailed bivariate Pearson correlations on PDEQ-SRV state dissociation scores and MCQ memory clarity total scores across events revealed a significant positive correlation for the distressing events ( $r = .23, p < .05$ ).

*State dissociation and posttraumatic stress symptoms.* None of the bivariate Pearson correlations assessing the relationship between IES-R total or subscale scores and the distressing events PDEQ-SRV state dissociation scores was significant.

*State dissociation and personality.* None of the two-tailed bivariate Pearson correlations between PDEQ-SRV state dissociation scores and BFI-44S neuroticism subscale scores was significant; however, as Table 9 indicates, they were all in the negative direction. Similar analyses between reported PDEQ-SRV state dissociation scores and CEQ fantasy-proneness scores revealed significant positive correlations for both the positive and the distressing events, also seen in Table 9.

Table 9: Correlations between State Dissociation and both Neuroticism and Fantasy-proneness by Event Type

	Positive event	Neutral event	Distressing event
BFI-44S neuroticism subscale	-.10	-.03	-.07
CEQ total score	.26*	.15	.32**

\* $p < .05$ . \*\*  $p < .01$ .

In sum, as the neutral events increased in age, reported state dissociation increased. As predicted, state dissociation levels were greater for the distressing events, then the positive, then the neutral events, respectively. Interestingly, and contrary to what was hypothesized, higher levels of state dissociation were associated with greater memory clarity for the distressing events. Also of interest were the non-significant findings for state dissociation and PTSD symptoms or neuroticism, and that reported state



dissociation increased with increased fantasy-proneness for both the positive and distressing events.

*Perspective: The Field/Observer Distinction*

*Perspective and age of memory.* A bivariate Pearson correlation (two-tailed) between Event Perspective and the age of the memory was significant for the distressing events only ( $r = .28, p < .05$ ), as was a similar correlation between Memory Perspective and the age of the memory, ( $r = .23, p < .05$ ).

*Perspective across different events.* As Table 10 illustrates, bivariate Pearson correlations (one-tailed) revealed that there were significant correlations between Event Perspective and Memory Perspective for all three events. The Event Perspective scale scores were significantly correlated with PDEQ-SRV item 5 (event perspective-taking) across all of the event types, also seen in Table 10. Therefore, the Event Perspective scale can be assumed to measure perspective-taking as does PDEQ-SRV question #5, as reflected in the findings from the aforementioned pilot study.

Table 10: Correlations for Perspective by Event Type

	Positive event	Neutral event	Distressing event
Event perspective and memory perspective	.29**	.32**	.48***
Event perspective and PDEQ-SRV #5	.28**	.42***	.43***

\*\* $p < .01$ . \*\*\* $p < .001$ .

As may be seen in Table 11, the differences in perspective scores across events were small, and two separate repeated measures ANOVAs on Event Perspective scores

and Memory Perspective scores did not reveal any significant differences ( $F[2, 144] = 2.73, p > .05$ , and  $F[2, 144] = .94, p > .30$ , respectively).

Table 11: Means and Standard Deviations (in parentheses) for Perspective by Event Type

	Positive event	Neutral event	Distressing event
Event perspective	2.07 (1.57)	2.12 (1.54)	2.58 (1.76)
Memory perspective	3.81 (2.07)	3.78 (2.06)	4.14 (2.05)

*Perspective and memory clarity.* Bivariate one-tailed Pearson correlations between Event Perspective scores and MCQ memory clarity total scores for each event were not significant. However, similar analyses for Memory Perspective scores showed significance for all three events: positive,  $r = -.24, p < .05$ ; neutral,  $r = -.41, p < .001$ ; and distressing,  $r = -.20, p < .05$ . These negative correlations indicate that memory clarity was associated with memorial field perspective.

*Perspective and trait dissociation.* Bivariate one-tailed Pearson correlations between both Event Perspective and Memory Perspective scores with trait dissociation (DES total scores:  $M = 25.77, SD = 16.33$ ) are displayed in Table 12. Only for the positive and neutral events was Event Perspective significantly positively correlated with trait dissociation.

Table 12: Correlations for Perspective and Trait Dissociation by Event Type

	Positive event	Neutral event	Distressing event
Event perspective	.25*	.22*	-.01
Memory perspective	-.13	.12	.01

\* $p < .05$ .

Overall, older distressing memories were associated with event and memory observer perspective-taking. Event and memory perspectives were positively associated for all three events; however, event and memory perspectives did not differ across the different types of events. Contrary to expectations, event perspectives were not related to memory clarity; yet generally consistent with prior expectations, more observer perspective-taking in memory were associated with poorer memory clarity in all three events. Trait dissociation was not related to memory perspective, contrary to predictions, but higher trait dissociation was indeed associated with more at event observer perspective-taking for the positive and neutral events.

#### *Posttraumatic Stress Symptoms – Distressing Events*

Because reported PTSD symptoms were collected with regards to the distressing event, but not the positive or neutral events, the following analyses are related to the distressing events only.

*PTSD symptoms, age of memory, and recall history.* None of the IES-R scores were significantly correlated with the age of the distressing memories, whereas only instances of verbal recall and avoidance symptoms ( $r = -.22, p < .05$ ) were significantly negatively correlated.

*PTSD symptoms and memory clarity.* As shown in Table 13, associations between the three clusters of PTSD symptoms and MCQ memory clarity total scores were assessed via bivariate one-tailed Pearson correlations. Only the positive correlation between IES-R intrusion symptom scores and MCQ memory clarity total scores was significant.

Table 13: Means and Standard Deviations for PTSD Symptoms, and Correlations with Memory Clarity

	<i>M</i>	<i>SD</i>	<i>r</i>
IES-R total score	26.15	19.51	.15
IES-R intrusion score	9.03	7.54	.26*
IES-R avoidance score	10.81	7.55	.02
IES-R hyperarousal score	6.32	6.49	.13

\* $p < .05$

*PTSD symptoms and perspective.* The bivariate one-tailed Pearson correlations between both Event and Memory Perspective with IES-R total and subscale scores were not significant. Furthermore, independent samples t-tests on total and subscale scores did not reveal any significant differences between extreme observer (ratings of 6 or 7) and field (ratings of 1 or 2) perspective-taking scorers (both at event and in memory) and scores on the IES-R.

*PTSD symptoms and personality.* To investigate associations between PTSD symptoms and neuroticism, bivariate two-tailed Pearson correlations were conducted on

IES-R total and subscale scores and BFI-44S Neuroticism subscale scores. No significant correlations were found. Differences were found with regards to PTSD symptoms and their association with fantasy-proneness. Bivariate two-tailed Pearson correlations between IES-R total and subscale scores and CEQ fantasy-proneness scores revealed significant positive relationships with respect to all the variables (see Table 14).

Table 14: Correlations Between PTSD Symptoms and both Neuroticism and Fantasy-Proneness

	IES-R total score	IES-R intrusion score	IES-R avoidance score	IES-R hyperarousal score
BFI-44S neuroticism subscale	-.00	-.04	.02	.01
CEQ total score	.34**	.30**	.33**	.30**

\*\* $p < .01$ .

In sum, age of the distressing events was not related to PTSD symptoms. Fewer frequent verbal recalls were associated with higher frequencies of reported avoidance symptoms, whereas more reported intrusion symptoms was associated with higher reported memory clarity. Contrary to expectations, no differences were found between PTSD symptoms and event or memory perspective, or neuroticism. Reported PTSD symptomatology, however, was positively associated with more fantasy-proneness.

Overall, memory clarity was related to positive valence, and for the positive events, the higher the reported arousal, and the higher the level of fantasy-proneness, the more clear the memory. For the distressing events, the more reported state dissociation, and more intrusive thoughts, the more clear the memory. And in general, the more field

perspective taking in memory, the more clear the memory. The positive and distressing events did not significantly differ on age of the memories, frequency of verbal recalls, written narrative word count, and arousal level reported at recall. All three of the memories did not significantly differ on the majority of accuracy-confidence detail question judgments, or on reported perspective at event or in memory.

### Discussion

The present investigation examined the relationships between memory clarity and several individual difference variables in relation to three different types of events. A number of these factors were found to be associated with the clarity of participants' memories, and differed across the type of event experienced. The associations between memory clarity and various personological variables (i.e., arousal, state dissociation, perspective, PTSD symptoms) are discussed first, followed by additional findings relating to memory characteristics (e.g., frequency of recall), and associations between these, and the other personological variables themselves.

The positive events were rated as being remembered more clearly than the distressing events, with both of these being remembered more clearly than the neutral events. This finding, at least in terms of the positive and distressing events, is at odds with studies claiming to support the trauma superiority argument, namely Porter and Birt (2001). It is in accordance, however, with a small but growing number of studies that have compared judgments on phenomenological characteristics of memories for positive and negative autobiographical events (e.g., Barnier, Hung, & Conway, 2004; Byrne et al., 2001; Destun & Kuiper, 1999), and with the study that included neutral events (D'Argembeau et al., 2003). The findings with regards to memory characteristic ratings

in this study, as in previous studies, does not seem to warrant conclusions related to the superiority of traumatic memory (as in Peace & Porter, 2004), or alternatively, to limited memory for traumatic experiences (as in Byrne et al., 2001). The current finding that the distressing events received memory quality ratings that did not differ greatly from the positive events, but were still recalled with more clarity than the neutral events suggests that these memories are not disintegrated or fragmented in one's conscious awareness. This pattern of results instead seemingly lends support to the landmark view of memories, or that emotional memories are distinctive (see Berntsen et al., 2003), not that there is a robust negative association of trauma and memory, as evidenced in some previous studies (see Christianson, 1992). In relation to only the distressing events, the older the memory, the poorer the clarity with which the participants report recalling this memory. That positive events were recalled more clearly, and that age seemingly did not play a significant role in recall of the positive memories lends support to the existence of a general positive bias in personal memory (e.g., Walker, Skowronski, Gibbons, Vogl, & Thompson, 2003). Yet, overall the combination of results regarding memory clarity suggests an interplay of factors that are related to recall, independent of the type of event experienced.

Positively valenced experiences were reported with a higher level of arousal at the time of the event than were the distressing events, and both were reported to have been experienced with more arousal than the neutral event. During recall of the event, positive and distressing events apparently evoked equivalent levels of arousal, and both evoked more arousal than recall of the neutral events. These findings show that participants did recall memories that were emotionally arousing. Further, for the positive event, higher

arousal during the event *and* at recall was associated with greater memory clarity. This finding is in line with the above finding that positive events were recalled with the most clarity of the three event types. Additionally, many autobiographical memory studies have found a positive association between emotional arousal and memory quality (see Christianson, 1992).

In relation to the distressing events, higher levels of state dissociation were associated with memory clarity - this finding is inconsistent with past literature (e.g., Mechanic et al., 1998). There was also no association found between event perspective and overall memory clarity; however, there was an association found between observer perspective-taking in memory and reduced memory clarity across all three events. In the current study, the memory clarity rating was comprised of *clarity judgments* on such aspects of memory as spatial arrangement of objects and people. The few previous studies in the area have tended to focus on the types of details reported (e.g., central or peripheral objective details). Future studies should include both objective and subjective ratings of memory characteristics to examine further the association between perspective and memory characteristics.

Although neither Cooper's (2004) nor Wegner's (1989, 1994) hypotheses concerning PTSD avoidance symptoms and memory clarity were supported, higher levels of reported experiences of intrusion symptoms were positively associated with memory clarity. This finding makes conceptual sense as mental intrusion of an event is analogous to recall of the event. Repeated rehearsal/reliving of an event likely leads to memory clarity for the event. This does not necessarily mean, however, that their memories are



accurate and consistent in some objective sense, just that participants' belief in their memories is stronger.

With regards to the neutral events, the more times a memory was recalled verbally, the more clearly it was recalled. It may be that in order for people to think about and make clarity-related judgments on their recall for an event with no emotional significance, they actually gained confidence in their memory through its repeated recall. Perhaps the null findings with regard to the positive and distressing events and recall reflect the already salient nature of the memory and a belief in better recall of that memory. In addition, participants were asked only about prior instances of *verbal* recall. Verbal rehearsals do not take into account how many times the event was recalled to themselves (i.e., thought about). It is very likely that the positive and/or distressing events were recalled in memory far more often than a neutral event with little personal meaning.

In addition to examining associations between memory clarity and affective/ personality variables, associations between these variables themselves were investigated. Interestingly, for the neutral event, older memories were associated with higher levels of reported state dissociation. Furthermore, there was no association found between state dissociation and PTSD symptoms relating to the distressing events, although both state dissociation and PTSD symptoms were positively associated with fantasy-proneness. This finding further supports the influence of this variable in any associations between dissociation and subsequent PTSD symptoms. As the link between state dissociation and PTSD, and the influence of neuroticism and fantasy-proneness remains somewhat ambiguous, future research should include an additional measure of trait anxiety as this

has previously been found to account for much of the risk of PTSD development (see Bowman, 1997).

No known study to date has examined differences between perspective at the time of the event and that at recall. Memory and/or psychological factors that may be associated with perspective variation have also previously been neglected. A unique aspect of the present study was the assessment of both reported event and memory perspective within events, and the additional comparison across event types. Although event and memory perspective were correlated across all types of events, there were no differences in perspective reported across the different types of events. It is likely that the events the participants reported were not interpreted as sufficiently disturbing to produce an extreme state dissociative reaction (i.e., the observer perspective) at the time of the event. It is important to note that the absolute values on the perspective scale were consistently low (indicating a greater degree of field perspective taking) across event types, and that they increased in almost identical amounts as measurement moved to memory. Alternatively, perhaps the participants were not of the disposition to dissociate severely during their traumatic experiences.

The association between PTSD symptoms and perspective has been similarly overlooked in past studies. In the present study for distressing events, no association between reported event or memory perspective and PTSD symptoms was found. While some of the few studies investigating this relation found, for example, that participants with PTSD symptoms reported more observer perspectives in memory (Berntsen et al., 2003), and that observer perspectives at the time of the event were associated with a greater frequency of experiencing PTSD symptoms (Cooper et al., 2002), there was not

enough variability on the present study's perspective-taking measures to reveal any association. However, the present finding is consistent with the McIsaac and Eich (2004) study in which PTSD symptoms did not vary in relation to memory perspective. The finding that higher levels of reported avoidance symptoms were associated with fewer instances of verbal recollection makes conceptual sense. If a person is actively trying to avoid thinking about a distressing event, they would also avoid talking about it.

The results of this study suggest that significant positive and distressing autobiographical memories are similar in a number of their characteristics, and are judged to be similar in a number of their phenomenological properties. The positive and distressing events reported were similar in age, number of times they had been verbally recounted to others, and in the number of words used to convey what happened during the specific event. They also evidenced similarities in terms of the accuracy-confidence ratings participants' made concerning the majority of memory detail questions. Finally, the positive and distressing events did not differ in the reported arousal during recall of the events, nor in the perspective taken at the time of the event and in memory. As found in some previous studies that compared emotional (i.e., traumatic and positive) events (for example, Byrne et al., 2001), absolute differences between all three of the events were not extreme in the current study. This finding is particularly noteworthy because neutral/non-emotional comparison events were included. The non-extreme differences could be an artefact of the type of neutral events the participants reported. For example, a number of participants reported experiences that included being with friends/family, a potentially positive valenced event, and being ill or at the dentist, potentially negative valenced events. The valence associated with these events could have had subtle

influences on recall and reporting on numerous other aspects of these events. Therefore, it would be advisable for future studies to restrict the type of neutral event reported to those with less emotional valence. Additionally, the majority of participants' 'most distressing' life event did not meet the recommended cut-off associated with the PTSD Checklist (Weathers, Litz, Herman, Huska, & Keane, 1993). Further, only a small percentage, if any, of those who exceeded this cut-off would meet the diagnostic criteria for PTSD. As the sample likely contains primarily high functioning people, few of whom reported significant psychological distress, it is possible that sampling from those with a more diverse range of psychological functioning would result in a more apparent pattern of relationships. Together, these results suggest that similar autobiographical memory studies, especially with non-clinical, undergraduate samples, may in fact be describing emotional memory in general, as opposed to 'traumatic' memory in particular. In addition to highlighting the need for the inclusion of a neutral/non-emotional event, not a positive event, to act as the baseline/control comparison, this confusion of 'traumatic' with 'emotional' experiences presents a concern with regards to generalizations about the effects of trauma on memory. Traumatic events are highly subjective, and are heterogeneous in terms of type and circumstances of the event (e.g., length of time, involvement, life threat) clearly making generalizations to all events and populations very difficult.

### *Limitations*

In addition to the questionable 'neutrality' of the neutral event, the present study is certainly not without other identifiable limitations. The study required participants themselves to chose and recollect the memories to report. Every effort was made to

ensure that the memories provided were as similar as possible. For example, memories were requested from approximately the same life stage (i.e., not subject to additional possible distortion because of age) in order to make memory comparisons meaningful. Therefore, the participants were asked not to (and did not) report childhood events. The present investigation relied entirely on self-report measures of retrospective phenomena, as have many autobiographical memory studies. It did not include an objective measure of accuracy or 'ground truth' for what actually happened during these events. Instead of focusing on the contents of autobiographical memory, the focus was on the participants' phenomenological judgments of their recall for different types of events. Further, it also called for judgments on the perceived accuracy to which they were recalling certain details, and the confidence they had that these recollections were correct. Such judgments are important to assess as this subjective accuracy and confidence can form the basis upon which decisions to act on or testify about their memories are made (Rubin & Siegler, 2004).

Despite these limitations, the present study was among the first to relate memory clarity for positive, distressing, and neutral events to a number of variables, such as arousal, dissociation, perspective, and PTSD symptoms. The underlying purpose was to identify associations between these variables and highlight areas for further study. The current findings may have implications in a number of areas that have conceptual ties to such research. In the forensic arena, police investigations and psychological assessments often require recollections regarding the circumstances of and details surrounding traumatic/criminal actions. There are benefits to investigative/assessment techniques in this regard when information on factors that correlate with memory are known. It is

important in terms of offenders claiming 'trauma' from or 'amnesia' for their criminal actions, and if there are known correlates that could flag such reports for justice system and mental health professionals. In research studies involving experiences of distress with non-clinical samples, a ubiquitous problem likely lies not in participant malingering, but in low symptom endorsement. Contrast this to the majority of PTSD studies that have utilized compensation-seeking samples (e.g., war veterans, motor vehicle accident 'survivors'), and there is a high likelihood of misinformation about the construct of PTSD. In addition, current clinical PTSD diagnosis methods rely completely, or at least primarily, on self-report (see Bowman, 2002). In a forensic context, such diagnostic tools are especially not optimal as offenders are expected to express guilt and remorse for their criminal actions, and are ultimately rewarded for doing so. An objective indication of functioning, as is included in the current DSM (Axis V: Global assessment of functioning; APA, 1994) is a way to investigate how (and if) the PTSD symptoms that the subject reports are affecting their daily functioning. Although overall functioning was not assessed in the undergraduate sample, it is interesting to note that symptoms of intrusion, avoidance, and hyperarousal were reported in response to a variety of typical life events. If it is assumed that very few, if any, would seek treatment in relation to these symptoms, endorsement of these symptoms indicates that they likely constitute normal reactions to life events, and those experiencing them can still function to at least a certain degree in a university setting. Further, it has been posited that pre-existing individual difference variables may account for the development of PTSD symptoms over any event-related characteristics (e.g., event type, severity); therefore, information in this

regard could vastly benefit the development of PTSD therapy techniques (see Bowman, 1997).

Depending on the types/variability of distressing events reported, future studies should categorize and compare responses across different distressing events. Numerous past studies have acknowledged, yet neglected, this aspect (e.g., Byrne et al., 2001); however, a few studies have included event categorizations in their analyses and have found significant differences (e.g., Porter & Birt, 2001). It would be interesting to investigate a subset of the memories provided in the present investigation in terms of the flashbulb memory hypothesis. A number of the distressing events recalled involved experiences of hearing of a death or bad news, which have been the primary focus of flashbulb memory studies.

In a similar vein, it would also be interesting to follow-up with the same participants in a number of months time to collect consistency information for the memories provided. In the present study, participants wrote a short narrative account of each reported event. These written narratives could be coded for type, quantity, and quality of memorial details, and subsequently compared across memory types and testing sessions.

The empirical study of trauma, clarity of phenomenological characteristics of memory, dissociation, and posttraumatic stress responses will provide answers to a variety of questions of theoretical import within human cognition, perception and emotion. In an applied setting, judicial fact finders are forced to make credibility assessments of 'traumatic' memories from the past. Often professionals are called to give expert testimony on these and other related issues. This and other studies investigating

'traumatic' memory via a multitude of variables will serve to inform experts in this area.

Knowledge on perspective taking will provide information on the occurrence of and reasons underlying an individual's cognitive perspective taking capacity. Further understanding of variations in perspective has important implications for current memory theory, and will be an interesting step towards exploration of other related memory processes.



## APPENDICES

## Appendix A. Means, Standard Deviations, Minimum, and Maximum Values for Memory

## Characteristics and Questionnaires for Positive Memory

	<i>M</i>	<i>SD</i>	<i>Minimum</i>	<i>Maximum</i>
Age of memory in months	25.26	30.04	0	180
Number of verbal recalls	8.10	16.87	0	100
Narrative word count	73.92	39.89	13	181
MCQ total score	198.71	25.03	147	254
Affect Grid arousal 'at event'	7.70	1.36	4	9
Affect Grid arousal 'currently'	5.65	1.72	2	9
PDEQ-SRV total score	18.60	6.88	10	47
Perspective 'at event'	2.07	1.57	1	7
Perspective 'in memory'	3.81	2.07	1	7

## Appendix B. Means, Standard Deviations, Minimum, and Maximum Values for Memory

## Characteristics and Questionnaires for Neutral Memory

	<i>M</i>	<i>SD</i>	<i>Minimum</i>	<i>Maximum</i>
Age of memory in months	6.15	12.63	0	67
Number of verbal recalls	1.22	2.20	0	15
Narrative word count	56.52	33.14	4	146
MCQ total score	165.29	29.38	97	246
Affect Grid arousal 'at event'	4.79	2.01	1	9
Affect Grid arousal 'currently'	3.92	1.44	1	8
PDEQ-SRV total score	15.75	6.05	10	36
Perspective 'at event'	2.12	1.54	1	7
Perspective 'in memory'	3.78	2.06	1	7

## Appendix C. Means, Standard Deviations, Minimum, and Maximum Values for Memory

## Characteristics and Questionnaires for Distressing Memory

	<i>M</i>	<i>SD</i>	<i>Minimum</i>	<i>Maximum</i>
Age of memory in months	32.40	36.70	0	169
Number of verbal recalls	7.49	16.36	0	100
Narrative word count	81.71	39.70	11	198
MCQ total score	185.86	29.80	115	253
Affect Grid arousal 'at event'	6.40	2.40	1	9
Affect Grid arousal 'currently'	5.20	1.75	1	9
PDEQ-SRV total score	25.64	8.67	10	46
Perspective 'at event'	2.58	1.76	1	7
Perspective 'in memory'	4.14	2.05	1	7
IES-R total score	26.15	19.51	0	70

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