Narrative Coherence of Child Maltreatment Memories in Adults

Na Zhu

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NARRATIVE COHERENCE OF CHILD MALTREATMENT MEMORIES IN ADULTS

By

Na Zhu

A Dissertation
Submitted to the Faculty of Graduate Studies
through the Department of Psychology
in Partial Fulfillment of the Requirements for
the Degree of Doctor of Philosophy
at the University of Windsor

Windsor, Ontario, Canada

2020

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NARRATIVE COHERENCE OF CHILD MALTREATMENT MEMORIES IN ADULTS

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AUTHOR’S DECLARATION OF ORIGINALITY

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ABSTRACT

Narrative identity, an integrative story of the self and developed from cumulative life experiences, guides self-perception, behaviours, and understanding of the world (McAdams, 2001; Pals, 2006). Once established, new experiences typically fit within this narrative identity. However, some experiences, such as child maltreatment, are so disruptive that they are not easily integrated into one’s life story and coherently narrated, manifesting in psychological problems (Pals, 2006; Vanderveren et al., 2017; Waters & Fivush, 2015). While the literature on the coherence of trauma narratives is inconsistent (e.g., Brewin, 2014; Rubin et al., 2016), studies on child maltreatment, which focused on child sexual abuse, found that these narratives were less coherent than non-trauma narratives (e.g., Miragoli et al., 2017; Mossige et al., 2005).

Building from this literature, the purpose of the current study was three-fold. The first goal was to examine if child maltreatment (trauma) narratives were less coherent than positive event (non-trauma) narratives for the same person. The second goal was to investigate if ego development, the framework that people use to make sense of their experiences, and posttraumatic stress symptoms moderated the relation between child maltreatment and coherence of maltreatment narratives. Finally, the third goal was to examine if coherence of maltreatment narratives mediated the relations between child maltreatment and psychological distress and life satisfaction.

For the current study, 204 adults who experienced child maltreatment (i.e., sexual, physical, and/or emotional abuse and neglect before the age of 19 years) were recruited from Canada. Participants completed questionnaires on their child maltreatment experiences, memory disorganization, psychological functioning, personality, and social supports. They also wrote a detailed description of their child maltreatment experience and its impact, which was coded for
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narrative coherence (Reese et al., 2011). Results of the present study revealed that child maltreatment narratives were more coherent than non-trauma, positive event narratives, not less as hypothesized. In fact, child maltreatment was not associated with coherence of maltreatment narratives at all; and as such, the proposed moderation and mediation models were not a good fit to the data. Nonetheless, several significant associations were found that were consistent with the maltreatment literature. Ego development predicted greater coherence of maltreatment narratives, child maltreatment predicted greater psychological distress, and coherence of maltreatment narratives predicted lower psychological distress.

The present study contributed to the literature by contrasting the coherence level of child maltreatment versus non-trauma narratives and considering the potential reasons to why child maltreatment narratives were found to be more coherent than non-trauma narratives in the current sample. The study confirmed previous findings on the association between child maltreatment and narrative coherence with psychological distress. In addition, the present study suggested the importance of the role of narrative processing in trauma treatment.
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CHAPTER I

Introduction

Narrative identity is defined as an integrative story of the self that provides a person with a sense of unity and purpose and serves as a guide for future experiences (McAdams, 2001; McAdams & McLean, 2013). Based on the narrative identity framework, people are actively making sense of their experiences from a young age, and over time, this contributes to a narrative identity that affects how people understand and present themselves (McAdams, 2001; Pals, 2006). Whereas some experiences fit neatly into people’s existing life-narrative, some experiences are so disruptive that people are unable to integrate these effectively into their overall life story (Pals, 2006). This may be due to a number of factors, including avoiding trauma reminders (e.g., Hayes et al., 2017), compartmentalizing the trauma through dissociations (e.g., Halligan et al., 2003), and having a negative self-representation that affects the recollection of trauma events (e.g., Valentino et al., 2009). These may be especially true for experiences of child maltreatment (i.e., sexual, physical, and emotional abuse and neglect) because the perpetrators are often those who are expected to provide care and safety (Kaufman & Cicchetti, 1989; van der Kolk, 2005). Thus, individuals may have difficulty narrating these experiences coherently, resulting in psychological distress. In fact, child maltreatment is associated with psychological distress, which captures a range of symptomology related to internalizing and externalizing disorders that can be assessed using various questionnaires, such as the Symptom Checklist-90-Revised (e.g., Derogatis, 1983; Jaffee, 2017; Maschi et al., 2012). Child maltreatment is also associated with lower life satisfaction, a self-evaluative component of subjective well-being (Herrenkohl et al., 2012; Sheikh et al., 2016).
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The inability to integrate child maltreatment memories into a coherent sense of self increases the risks for psychopathology (Ehlers & Clark, 2000). In contrast, being able to coherently narrate one’s adverse experiences has been found to be related to life satisfaction and lower psychological distress (e.g., Baerger & McAdams, 1999; Graci & Fivush, 2017; Pals, 2006). The concept of narrative coherence is not consistently well-operationalized in the literature, resulting in mixed findings (Crespo & Fernández-Lansac, 2016; Rubin et al., 2016). According to Reese and colleagues (2011), coherence refers to the degree to which a narrative makes sense to the audience and includes information on the time, place, and temporal order of the events, as well as the degree of elaboration and meaning making in the narratives. In the present study, two measures of narrative coherence were used to assess and understand coherence from different perspectives: 1) global coding of the narrative content (Reese et al., 2011), and 2) subjective ratings by narrators of their own memory deficits (Halligan et al., 2003).

Whereas some researchers have found that trauma narratives are less coherent than non-trauma narratives for the same person and among people with posttraumatic stress disorder than without (e.g., Brewin, 2014; Ehlers & Clark, 2000), others did not find such differences (e.g., Rubin, 2011; Rubin et al., 2016). When considering the coherence of child maltreatment narratives, a few existing studies focused on child sexual abuse and found that these events were narrated as less coherent as compared to narratives of other stressful events (e.g., Mossige et al., 2005) and in those with posttraumatic stress disorder than without (e.g., Miragoli et al., 2017). Numerous factors may contribute to the relation between child maltreatment and narrative coherence that warrant further examination. One factor that has been studied in relation to narrative coherence is ego development, which is defined by Loevinger (1976) as the framework that people use to make sense of their personal experiences (Adler et al., 2007). Other variables
are posttraumatic stress symptoms such as the avoidance of stimuli, intrusion and dissociation symptoms, and negative alterations in cognitions and mood (Ehlers & Clark, 2000; Halligan et al., 2003; van der Kolk & Fisler, 1995).

Given the unfortunate consequences associated with child maltreatment, it is crucial for researchers to understand why child maltreatment has profound lasting effects. The purpose of the present study was three-fold. The first goal was to examine if child maltreatment narratives were less coherent than non-trauma narratives for the same person. The second goal was to investigate ego development level and posttraumatic stress symptoms as two possible moderators in the relation between child maltreatment and coherence of child maltreatment narratives (e.g., Adler et al., 2007; Halligan et al., 2003). The third goal was to examine whether coherence of child maltreatment narratives mediated the relations between child maltreatment and psychological distress and life satisfaction. Narrative coherence was measured by global coding of narrative content (Reese et al., 2011) and subjective ratings of memory deficits (Halligan et al., 2003). As indicated above, there is robust evidence that child maltreatment is associated with psychological problems and the inability to make meaning of and coherently narrate child sexual abuse experiences increases the risks for psychopathology (e.g., Ehlers & Clark, 2000; Jaffee, 2017; Mossige et al., 2005). It is possible that the inability to narrate maltreatment experiences coherently is critically important in the pathway through which child maltreatment is associated with psychopathology.

In the following sections, there is a review of the literature on narrative identity and autobiographical memory (e.g., McAdams, 2001; 2008; Rubin, 2005), child maltreatment (e.g., Bernstein et al., 2003; Fallon et al., 2010), autobiographical memory and narrative coherence of trauma events (e.g., Brewin, 2014; Ehlers & Clark, 2000; Rubin et al., 2016), and psychological
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distress and life satisfaction (e.g., Diener et al., 1985; Herrenkohl et al., 2012; Sheikh et al., 2016). In addition, the rationale for the current study is presented, followed by research questions and hypotheses, method, results, and discussion.
CHAPTER II

Review of Literature

Narrative Identity and Autobiographical Memory

Narrative identity, defined as an internalized, evolving, and integrative story of the self across time and concept, affects how people understand and present themselves (McAdams, 2001, 2008; McAdams & McLean, 2013; Pals, 2006). Based on this framework, the various ways that people tell the stories of their lives matter for their well-being. From an early age, people tell stories about their lives that are shaped by their perceptions of events and the meaning they impart onto them. People’s stories are situated in the historical context within which they are embedded, and their stories reflect cultural norms and values (McAdams, 2001, 2006, 2008). These experiences accumulate over time, and beginning in late adolescence and early adulthood, people construct a narrative identity (McAdams, 2001, 2008; Pals, 2006). In order to establish a sense of coherence or unity, people begin to reconstruct their past, perceive the present, and anticipate the future in accordance with this narrative identity (Habermas & Bluck, 2000; McAdams, 2001; McAdams & McLean, 2013). This can be achieved in three ways: 1) by the way in which their lives are narrated, interpreted, and evaluated; 2) by central narrative themes; and 3) by the selection or de-selection of events to be included in the life story (Köber & Habermas, 2017). Within this framework, life stories ultimately represent people’s efforts to understand and integrate the different aspects of themselves into a coherent whole (McAdams, 2001, 2008).

Development of Autobiographical Memory

Autobiographical memories are memories of personally experienced events that include not only descriptions of the events, but also personal interpretation and evaluation of those
events (e.g., Conway & Pleydell-Pearce, 2005; Rubin, 1995; Rubin, 2005; Wright, 2011). When people recollect autobiographical memories, their remembering of the events is frequently accompanied by a sense of travelling back in time and reliving the events as they took place (Rubin, 1995; Wright, 2011). This is different from other memories that may also be personally relevant, but without a sense of recollecting the original event. Autobiographical memories often include the presence of contextual details such as the who, what, when, and where, as well as the phenomenological details such as visual or other sensory details, affective recall, physical reactions, and emotional intensity (Rubin et al., 2003; Soucie, 2016). In fact, phenomenological characteristics have been found to differentiate perceived autobiographical events from imagined autobiographical events (Johnson et al., 1988).

People begin to develop autobiographical memories at a very young age. Autobiographical memory emerges as early as the end of age 2 when children have developed a sense of self that enables memories to be stored as autobiographical (Howe & Courage, 1997; McAdams, 2008). By age 3, children can actively co-construct past experiences through conversations with adults. Although adults continue to influence children’s stories, by the end of age 4, children are able to recollect their past experiences without active adult guidance (Fivush, 1994). By this time, children show good understanding of the different features of a story, such as that stories are set in a particular time and place and involve characters with different goals (Miragoli et al., 2017). Young children typically remember episodic or semantic memories, and their autobiographical memories are generally less specific and coherent (Howe & Courage, 1997; Reese et al., 2011). As they age, however, they begin to have greater differentiation of their memories, which may be related to developmental advances in language skills, general knowledge, perspective taking, notion of time and place, and memory storage capacity (Howe &
Courage, 1997; Reese et al., 2011). For example, in middle childhood, children begin to orient their memories in time and place, and this development continues well into adolescence (Friedman et al., 2009; Reese et al., 2011). In adolescence, people show an understanding of advanced temporal reasoning, which allows them to place each action in relation to other actions and connect different events meaningfully (Reese et al., 2011). By the end of adolescence and early adulthood, people are generally able to identify an overarching theme that integrates the different events coherently and meaningfully (Habermas & Bluck, 2000; Reese et al., 2011).

Autobiographical memory develops within social contexts, particularly through early interactions with caregivers (Reese et al., 2017; Salmon & Reese, 2015; Waters et al., 2018). Typically, as children develop verbal language skills, parents often encourage them to talk about their personal experiences. At first, parents may remind their children of recent events and guide them to interpret and discuss the events with them (Reese et al., 2017). Through conversational scaffolding during these discussions with parents, however, children soon begin to take more initiative in sharing information about personal events (Harley & Reese, 1999; Reese et al., 2017). Indeed, parental conversation style has been shown to be associated with the age and remembering of early childhood memories (e.g., Harley & Reese, 1999; Jack et al., 2009). Harley and Reese (1999) studied 58 preschool children and their primary caregiver mothers at three points in time and found that both maternal reminiscing style and children’s self-recognition predicted children’s very early ability to talk about the past. Self-recognition was assessed using the mirror test, in which the children had to touch within two centimetres of the odorless blue face paint that was placed on their nose after looking at their faces in a mirror. Furthermore, in a longitudinal intervention study conducted by Reese and colleagues (2020), the authors found that mothers who participated in a brief elaborative reminiscing training were
more elaborative when reminiscing about positive and negative events 8 years later than mothers who did not receive the training. Reese and colleagues (2020) found that the children of the mothers who received the training were also more elaborative when discussing both positive and events. When they became adolescents, they were more coherent when discussing low-point events. In general, the ways in which parents converse with their children about past experiences and the content of these conversations have significant implications for children’s understanding and memories of their experiences, as well as for their psychological well being (Salmon & Reese, 2015).

When considering the maltreatment context, however, maltreating parents likely do not reminisce with their children the same ways as non-maltreating parents. Specifically, maltreatment incidents are more likely to occur within impoverished, stressful, and chaotic home environments with higher levels of parental psychopathology; and as such, parents are unlikely to tailor their conversations or interactions to the children’s developmental level, to talk sensitively about the present and past, and/or to provide comfort in times of distress (Salmon & Reese, 2015). Experiences of maltreatment specifically are even less likely to be openly discussed or processed, which has negative implications on maltreated children’s language development, emotional knowledge, and physiological regulation (Greenhoot et al., 2013; Salmon & Reese, 2015). The nature of relationships is important in memory recall, possibly through the process of sharing, processing, or rehearsing the events or through co-constructing of the memories of such events (Greenhoot et al., 2013; Waters & Fivush, 2015).

In fact, frequency of rehearsal of early childhood memories has been shown to be associated with later recall of such memories, either through verbal or external memory aids, although the findings are inconsistent (Rubin et al., 2003; Wright, 2011). For example, Usher
and Neisser (1993) asked 222 college students about one of four important life events – birth of a sibling, death of a loved one, hospitalization, and moving to a new home – that occurred at ages 1, 2, 3, 4, or 5. They found that external information sources (e.g., stories, photographs) improved recall in children ages 4 and 5, but not in those under age 4. In contrast, Jack and Hayne (2007) found that the external memory cues and extensive rehearsal had no effect on early memory recall. Nonetheless, given the effects of important relationships and rehearsal of memory in memory recollection, these were included as potential covariates in the current study.

In general, adults recollect fewer memories that have occurred in childhood, and when remembered, these memories have less phenomenological details, such as lower imagery and sensory details, compared to memories from other periods (Berntsen & Rubin, 2002; Wright, 2011). This is consistent with the literature on retention interval (i.e., time since occurrence) which shows that the most forgetting occurs in the first one to two years after an event occurs, followed by a gradual monotonic decline as more time passes (Waters et al., 2013). Memories of childhood trauma, however, may not follow the same forgetting curve as do memories of developmentally normative events, but retention interval, nonetheless, may still affect the recall of such memories (Graci & Fivush, 2017; van der Kolk & Fisler, 1995). For example, Waters and colleagues (2013) found that when retention interval was controlled, there were no significant differences in memory quality across intensely negative and positive events. However, when it is not controlled for, negative event memories were less clear and had less details. In the current study, retention interval was also included as a potential covariate.

Whereas narratives of some autobiographical memories fit neatly into people’s narrative identity and existing story line, others, such as narratives of trauma memories, pose challenges to
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this identity (McAdams, 2001). As discussed below, incidences of child maltreatment are examples of such trauma events.

**Child Maltreatment**

At the beginning stages of life, children are fully dependent on their caregivers to meet their basic physical and emotional needs. They rely on their caregivers to respond to their cues of distress in a timely, accurate, and emotionally warm manner. Based on attachment theory, the degree to which these needs are met strongly influences children’s attachment style and relatedly, their internal working model that guides their expectations, thinking, feelings, and behaviour (Bowlby, 1983, 1988). When these basic physical and emotional needs are repeatedly met in a satisfying manner, children develop a sense of security, a positive representation of the self, and an internal working model that views others as trustworthy and the world as safe to explore (Bowlby, 1983, 1988; Cicchetti & Banny, 2014). Conversely, when caregivers repeatedly fail to meet these basic needs, children develop a negative self-representation and an internal working model that views others and the world as unpredictable. Studies have revealed that child maltreatment is associated with insecure attachment and often disrupts people’s core beliefs about self, others, and the world, causing great distress either at the time or at some point later (Capella, 2017; Cicchetti & Banny, 2014). In the following sections, there is a review on the definition and outcomes of child maltreatment.

**Defining Child Maltreatment**

Child maltreatment, including child sexual, physical, and emotional abuse and neglect, is considered a trauma occurring in childhood. Mlotek and Paivio (2017) defined trauma as a negative disruptive event that exceeds people’s coping capacity or alters their previous existing core beliefs. As one form of child maltreatment, sexual abuse is defined as sexual contact or
conduct between a child younger than 18 years of age and an adult or older person (Bernstein et al., 2003). The 2008 Canadian Incident Study of Reported Child Abuse and Neglect described sexual abuse as including the following: penetration, attempted penetration, oral sex, fondling, sex talk or images, voyeurism, exhibitionism, exploitation, and other sexual abuse (Fallon et al., 2010). Physical abuse is defined as bodily assaults on a child by an adult or older person that posed a risk of or resulted in injury (Bernstein et al., 2003); and this is comprised of the following: shake, push, grab or throw, hit with hand, hit with object, punch, kick, or bite, choking or poisoning, stabbing, and other forms of physical abuse (Fallon et al., 2010). Emotional abuse is defined as verbal assaults on a child’s sense of worth or well-being or any humiliating or demeaning behaviour directed toward a child by an adult or older person (Bernstein et al., 2003); and this is comprised of the following: terrorizing or threat of violence, verbal abuse or belittling, isolation or confinement, inadequate nurturing or affection, exploiting or corrupting behaviour, and exposure to non-partner physical violence (Fallon et al., 2010). Finally, neglect pertains to the failure of caretakers to provide for the child’s basic physical needs for adequate food, clothing, shelter, and medical treatment (Bernstein et al., 2003; Cicchetti & Banny, 2014); and this is comprised of the following: failure to supervise to prevent physical harm, failure to supervise to prevent sexual abuse, permitting criminal behaviour, physical neglect, medical neglect, failure to provide psychiatric or psychological treatment, abandonment, and educational neglect (Fallon et al., 2010).

In Canada, the rate of substantiated maltreatment is 14.19 per 1000 children, and in the United States, the rate of substantiated maltreatment is 9.2 per 1000 children (Cicchetti & Banny, 2014; Fallon et al., 2010). Given that some children with unsubstantiated reports have actually experienced maltreatment and that many instances of child maltreatment are either not
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investigated or reported (Hussey et al., 2005), these rates are likely much higher across both countries. Furthermore, research suggests that unsubstantiated cases also result in significant psychosocial maladjustment (Cicchetti & Banny 2014). Several researchers have suggested that different characteristics of maltreatment may have different effects on child development, including age of first report, frequency and severity, chronicity or duration, and types of maltreatment (English et al., 2005). Specifically, English and colleagues (2005) found that the frequency of maltreatment incidents (including physical abuse, sexual abuse, emotional maltreatment, physical neglect/failure to provide, neglect/lack of supervision) predicted behavioural problems. The authors also found that longer duration of maltreatment predicted impairments in social functioning and younger age at first report predicted poorer daily living skills. In addition, Kaufman and Cicchetti (1989) found that children exposed to physical abuse were considered more aggressive by their peers than those exposed to emotional abuse or neglect.

Child sexual abuse specifically has garnered much of researchers’ attention. A meta-analysis that included 217 publications between the years of 1980 and 2008 and 331 independent international samples found that the self-reported prevalence rate of child sexual abuse is 12.7% with higher rates for females (18%) than males (7.6%) (Stoltenborgh et al., 2011). Some studies revealed that the content of child sexual abuse memories can be forgotten (e.g., Briere & Conte, 1993; Williams, 1994), whereas the perceptual and sensory stimuli associated with the events are remembered (Ehlers & Clark, 2000); this is further discussed later in the section on narrative coherence of trauma memory. Williams (1994) found that younger age at the time of abuse and increased closeness with the perpetrator are more likely to be associated with participants’ forgetting. Abuse by someone close is associated with betrayal, fear, and conflict, as well as guilt
and distress, which may lead people to feel confused and to have trouble with memory details. Furthermore, such experiences may be ignored or hidden by family members, which signals to the individuals to forget about the abuse (Williams, 1994). Unfortunately, many instances of child sexual abuse are perpetrated by a familiar person. Simon and colleagues (2015) examined 160 children and adolescents with confirmed cases of child sexual abuse (age ranged from 8 to 15 years, $M = 11.36, SD = 2.23$) and found that most participants knew the perpetrators (35% parental figure, 25% relative, 37% familiar nonrelative, and 3% stranger) and 43% of them lived with the perpetrator at the time of the abuse.

Often times, children experience multiple forms of child maltreatment. Complex trauma is a term that has been adopted in the literature to describe early and repeated trauma in the family context (van der Kolk, 2005). It has been conceptualized to capture the exposure to developmentally adverse trauma events that occurred early in life, repeated over time, and perpetrated by individuals within the caregiving system, as well as the consequences of these trauma events (Cook et al., 2005; Gallegos & Hillbrand, 2016; van der Kolk, 2005). Complex trauma includes physical, emotional, and sexual abuse, witnessing domestic violence and serious household dysfunctions, as well as neglect (Gallegos & Hillbrand, 2016). Cook and colleagues (2005) postulated that complex trauma is associated with impairment outcomes across the domains of attachment, biology, affect regulation, dissociation, behavioral control, cognition, and self-concept.

**Psychological Outcomes of Child Maltreatment**

In general, child maltreatment is associated with various adverse physical and mental health consequences across the lifespan, such as increased risks for depression, anxiety, posttraumatic stress disorder, suicide attempts, developmental disabilities, substance abuse,
criminal behaviour, and chronic health problems (e.g., Cicchetti & Banny, 2014; Cook et al., 2005; Fallon et al., 2010; Jaffee, 2017; van der Kolk, 2005). Gabbay and colleagues (2004) found that 20 to 63 percent of the individuals who experienced child maltreatment develop posttraumatic stress disorder, a higher prevalence rate than among children who are medically ill or survivors of natural disaster. Furthermore, a review of 23 studies published between 1996 and 2011 that examined childhood trauma and subsequent physical and mental health impact in adults aged 50 years and older revealed that trauma occurring in childhood is associated with mental health problems, physical health problems, and increased rates of re-victimization later in life (Maschi et al., 2012). There is evidence that high chronicity of maltreatment and exposure to multiple forms of maltreatment are associated with poorer developmental competence and mental health overall (English et al., 2005; Kaufman & Cicchetti, 1989). As the intensity or severity of exposure increases, symptom levels or the probability of psychological disorder also increases (Freer et al., 2010).

The relation between child maltreatment and poor psychological outcomes is clear and robust. However, not all maltreated individuals follow a negative developmental trajectory (Cicchetti & Banny, 2014). A factor that contributes to this relation is how people remember and make sense of these trauma events, as discussed in the next section.

**Autobiographical Memory and Narrative Coherence of Traumatic Events**

Trauma events have been proposed to be poorly encoded, which in part explains poor recollection of such events (Brewin, 2001; Römisch et al., 2014). The extreme level of stress experienced during trauma exposure may be associated with difficulty managing the memory; that is, stress may affect the encoding of such events into memory through impairment in the brain structures involved in the encoding of coherent, explicit, contextually situated memories.
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(Brewin, 2007). According to Ehlers and Clark (2000), the type of processing during trauma exposure – conceptual versus data-driven processing – contributes to the nature of the memory. Whereas conceptual encoding reflects processing of the trauma event in an organized way by placing it in context and processing the meaning of the situation, data-driven encoding reflects processing the perceptual and sensory impressions of the event (Ehlers & Clark, 2000; Roediger, 1990). Those who engaged in conceptual encoding would be able to remember the specific event coherently from memory, whereas those who engaged in data-driven encoding would likely have difficulty remembering the memory content but would be more easily primed for the accompanying perceptual stimuli. This is shown in the child sexual abuse literature in which the content of child sexual abuse memories is forgotten (e.g., Briere & Conte, 1993; Williams, 1994). For example, Briere and Conte (1993) studied 450 adults in treatment for child sexual abuse and found that 59% of them reported that they had forgotten about the abuse at some point before the age of 18 years. Unfortunately, there is no information on whether participants had a confirmed or documented history of child sexual abuse. Williams (1994) examined 129 women with a documented history of child sexual abuse and found that 38% of them did not recall the events. The literature on the recollection of autobiographical memory and accuracy of child sexual abuse memories is subjected to much debate (e.g., Briere & Conte, 1993; Loftus, 1993; Laney & Loftus, 2005; Scoboria et al., 2017; Widom & Morris, 1997) and is not the focus of the current study which places emphasis on the narrative coherence of remembered memories. Nonetheless, Ehlers and Clark (2000) suggested that during trauma exposure, the conceptual encoding is weakened, and the data-driven processing is strengthened. Indeed, there is evidence that trauma narratives are dominated by sensorial, perceptual, and emotional details when compared to narratives of other life experiences, and that heightened sensory details are related
to posttraumatic symptoms (e.g., Brewin et al., 1996; Crespo & Fernández-Lansac, 2016; Ehlers & Clark, 2000; Halligan et al., 2003; McKinnon et al., 2017; O’Kearney & Perrott, 2006; Rubin et al., 2008).

A potential deficiency in the encoding of trauma events leads to problematic storage and retrieval of the memories of such events. One way to capture memories of child maltreatment is through the narratives about such events. Narratives provide a window into how coherently individuals understand these events (O’Kearney & Perrott, 2006). The narrative coherence of trauma memories is discussed below.

Understanding Narrative Coherence

The process of constructing narratives of traumatic events not only reflects the degree to which people recollect the memory, but also how they interpret the events as relating to their larger sense of self (Graci & Fivush, 2017; Fivush, 2011; McAdams & Pals, 2006; McLean et al., 2007; Simon et al., 2015). Narrative coherence is one way to examine how the various parts of a memory are interrelated in a meaningful way. McCabe and Peterson (1984) were among the first to systematically define coherent narratives and found that good narratives included complex episodic content (i.e., who, what, when, where, why, and how), affective components, sophisticated sentence structure, and use of transitions. Additional researchers define coherent narratives as those that include contextual and surrounding details which allow people to place the events along the timeline of their life story (Fivush et al., 1995). More recently, researchers have begun to define coherent narratives as including specific details about the context, chronology, and theme of the memory (Baker-Ward et al., 2007; Morris et al., 2010; Reese et al., 2011; Waters & Fivush, 2015).
Reese and colleagues (2011) conceptualized narrative coherence based on two traditions of studies, schema models of memory and representation and linguistic analysis of the narrative form. Both approaches posit that coherent narratives include orienting and contextual information about the events, referential information about what occurred, and evaluative information pertaining to the meaning of the events. Reese and colleagues (2011) proposed that coherent narratives are those that make sense to the audience and include three distinct dimensions: context, chronology, and theme. The context dimension assesses the extent to which the narratives clearly orient the events in time and place (i.e., where and when the events took place); this information is necessary for the audience to make sense of the event description that follows. The chronology dimension captures the temporal ordering of the actions within the events. For this dimension, the actions do not need to be narrated in the order of occurrence, so long as the narratives include temporal and causal linguistic markers to clarify the order. Finally, the theme dimension assesses the extent to which the narratives include detail and elaboration to link component actions together in a meaningful way that relate to a larger sense of self, affective or evaluative information, and the inclusion of a high point and a resolution (Reese et al., 2011).

The three dimensions of coherence show different patterns of development across ages. Specifically, the chronology dimension emerges in infancy and develops across childhood; the context dimension emerges in middle childhood and develops across adolescence; and the theme dimension, particularly the ability to find resolution or connection to other events or the self, emerges in early adolescence and develops into young adulthood (Reese et al., 2011). Reese and colleagues (2011) examined the developmental trajectories for the three dimensions of coherence in preschool children, school-aged children, adolescents, and adults. They found similar
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developmental patterns across ages, with chronology coherence emerging first, followed by context coherence, and then theme coherence. Specifically, Reese and colleagues found that preschool children scored low on all three dimensions of coherence, but with some ability to stay on topic. All dimensions of coherence followed a developmental progression from school-age to adolescence, with adolescents specifying both time and place of event, placing more than 75% of the narrative in chronological order, and staying and elaborating on topic. However, adolescents continued to struggle to find resolution in their narratives. Finally, adults generally scored higher on all three context, chronology, and theme dimensions. Whereas both context and chronology dimensions peaked in adulthood and declined in mid-life, theme coherence continued to increase throughout the lifespan (Reese et al., 2011).

The theme dimension of narrative coherence is akin to meaning making, which has been defined variably in the literature, including reflecting on and evaluating thoughts and feeling about the event, forming a coherent and explanatory narrative about the event, finding resolution and reframing the event in a new light, and identifying life impact, lessons, or insights learned from the event (Greenhoot et al., 2013; Park, 2010). In the context of highly stressful life experiences, meaning making may reflect the reduction of the discrepancy between one’s global beliefs and goals and the appraised meaning of the event. This is done through either adjusting the appraised meaning to be more consistent with existing global beliefs and goals or changing the global beliefs and goals (Park, 2010). In their study of adults who had been sexually abused as children, Wright and colleagues (2007) found that participants’ responses on meaning making was predominately related to shattered assumptions about the self or the world (e.g., negative changes in themselves, such as damaged trust), suggesting that participants in the study modified their existing global beliefs and goals in their meaning making process. While the meaning
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Making process in the context of child maltreatment is important, the focus of the present study is on the extent to which participants demonstrated meaning making in their narratives, which contributes to thematic coherence.

Across studies, trauma narratives with more coherence were associated with greater physical and psychological health, including fewer self-reported symptoms of posttraumatic stress, depression, and anxiety, as well as with relatively higher ego development, positive adjustment, and life satisfaction (e.g., Baerger & McAdams, 1999; Graci & Fivush, 2017; Pals, 2006; Simon et al., 2010; Vanderveren et al., 2017; Waters & Fivush, 2015). For example, Greenhoot and colleagues (2013) recruited 177 university students \( (M = 19.5, SD = 1.89) \) with and without self-reported history of abuse from childhood or adulthood and asked them to complete a cued autobiographical memory task, write about three of their most stressful or traumatic personal memories, rate the qualities of each of the memories, and complete several questionnaires assessing coping responses, ruminative tendencies, depressive symptoms, and posttraumatic stress symptoms. The written narratives of the memories were then coded using several indices of coherence and meaning making, such as context, chronology, and theme coherence, interpretations (subjective perspective on the event), reframing (positive or negative re-evaluation of the event), and lessons or insight learned. Greenhoot and colleagues (2013) found that participants who reported greater coherence and having made greater sense of the trauma had better psychological adjustment, even after controlling for abuse severity and recency. In contrast, narratives characterized by incoherence or disorganization are associated with psychopathology, especially posttraumatic stress disorder (e.g., Brewin, 2007; Buck et al., 2006; Crespo & Fernández-Lansac, 2016; Ehlers & Clark, 2000; Foa et al., 1995; Halligan et al., 2003; Jones et al., 2007).
Although the relation between trauma coherence and psychological functioning is clear, there are different perspectives and research findings on whether trauma narratives are coherent. Specifically, many have argued that trauma narratives are less coherent than narratives based on non-trauma memories for the same person (e.g., Brewin, 2014; Halligan et al., 2003; Römisch et al., 2014; Vrana et al., 2019; Waters et al., 2013) and among those with posttraumatic stress disorder than without (Jelinek et al., 2009; Jones et al., 2009). On the other hand, others have argued that trauma narratives are no different than non-trauma narratives (e.g., Rubin, 2011; Rubin et al., 2016) and between people with and without posttraumatic stress disorder (e.g., Römisch et al., 2014; Rubin et al., 2016). These perspectives are elaborated upon further below.

**Lower Coherence of Trauma Narratives**

Trauma theory postulates that trauma narratives are impaired across many domains including temporal organization, detail, and coherence as compared to non-trauma narratives (e.g., Ehlers & Clark, 2000; Waters et al., 2013). This is consistent with the understanding that trauma memories are poorly encoded and organized, and thus, less likely to be coherently recalled (Brewin, 2007; Ehlers & Clark, 2000; Halligan et al., 2003). Trauma exposure may be so disruptive that these events are unable to be assimilated into people’s ordinary beliefs, assumptions, and meaning structures, which prevents people from producing a coherent account of such events. Indeed, there is evidence that trauma narratives are associated with a third person, rather than a first person or self-referential perspective (Crespo & Fernández-Lansac, 2016), suggesting that these memories are likely not well integrated into people’s life stories. Halligan and colleagues (2003) recruited 73 adult participants who had experienced physical or sexual abuse and asked them to recall a trauma event and a non-trauma, unpleasant event. The participants were interviewed again at three, six, and nine months follow-up. Halligan and
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colleagues (2003) coded the narratives for disorganization by examining the narratives clause-by-clause at the utterance level for repetitions, uncertainty, confusion, non-consecutive chunks, and a lack of understanding of what happened. The authors found that narratives of the trauma event were more disorganized than narratives of non-trauma, unpleasant event. The way in which disorganization was conceptualized is similar to the way that low coherence has been conceptualized in other studies (e.g., Neimeyer et al., 2006).

Another perspective on the coherence of trauma narratives is that incoherence is a feature of posttraumatic stress disorder and trauma narratives are less coherent than non-trauma narratives specifically within the posttraumatic stress disorder population (e.g., Brewin, 2007, 2014, 2016; Jelinek et al., 2009; Jones et al., 2007). This perspective has some research support (e.g., Halligan et al., 2003; Jelinek et al., 2009; Jones et al., 2007). Jelinek and colleagues (2009) recruited 111 participants who were between 19 to 70 years old; 81 of the participants had experienced a trauma event and 26 met the criteria for posttraumatic stress disorder. Jelinek et al. (2009) elicited narratives about a trauma memory and a non-trauma, but unpleasant memory. The researchers used three different measures for coherence: utterance-level coding of disorganization, experimenter rating of coherence, and participant rating of disorganization. They found that after controlling for severity of trauma, verbal intelligence, severity of depression, and concentration, trauma narratives were less coherent and organized than non-trauma narratives in participants with posttraumatic stress disorder, but not in participants without posttraumatic stress disorder (Jelinek et al., 2009).

The relation between trauma and narrative coherence is also evident in treatment interventions that emphasize narrative processing of trauma, such as trauma-focused cognitive behavioral therapy (TF-CBT; Cohen et al., 2006; Westerman et al., 2017), prolonged exposure
(Foa & Kozak, 1986), and cognitive processing therapy (CPT; Resick, 2001; Resick & Schnicke, 1992). It is also demonstrated in the expressive writing literature that has found that changes in narratives precede changes in psychological well-being (e.g., Adler, 2012; Vrana et al., 2019). Foa and colleagues (1995) studied 14 women with histories of sexual assault (ages ranged from 18 to 48 years, \( M = 30.1 \), 11 Caucasians and 3 African Americans) entering exposure treatment with a trained clinician for seven biweekly individual sessions for 45-60 minutes each session. During exposure, participants repeatedly imagined and narrated their trauma experience as vividly and in as much detail as possible in the present tense as if it were happening to them again. They also described how they felt and what they were thinking to increase coherence of the experience. Foa and colleagues (1995) found that increases in indices of narrative organization were highly related to improvement. This study, however, is limited by its small sample size. Nonetheless, through narrative processing, the trauma experiences become integrated into people’s life stories and become a part of their dynamic self-concepts, rather than remaining dominating and troublesome (Cohen et al., 2006). In addition, it is also possible that there is a bidirectional effect in which individuals with higher psychological functioning are better able to process their trauma narratives.

**No Difference Between the Coherence of Trauma and Non-Trauma Narratives**

In contrast, some researchers have argued that trauma narratives do not differ from non-trauma narratives within the same people (e.g., Rubin, 2011; Rubin et al., 2016) and between people with and without posttraumatic stress disorder (Römisch et al., 2014; Rubin et al., 2016). Rubin (2011) recruited 30 participants (ages ranged from 18 to 22 years, 15 with and 15 without posttraumatic stress disorder) and asked them to narrate trauma memories and comparison memories of most positive and most important events. The narratives were assessed on several
measures of coherence, including experimenter and participant ratings and narrative coding on dimensions of context, chronology, and theme. Rubin and colleagues (Rubin, 2011; Rubin et al., 2016) found mixed findings depending on the measure used, but in general, trauma narratives were not less coherent than non-trauma narratives and there were no significant differences at the group level (posttraumatic stress disorder versus non-posttraumatic stress disorder). In addition, Römisch and colleagues (2014) compared 14 women with posttraumatic stress disorder and 14 non-traumatized women on narratives of distressing, angering, and happy memories. Results revealed that the different types of narratives did not differ on the degree of internal states reported (e.g., emotions and cognitions), but the narratives of distressing memories were more fragmented (e.g., unfinished utterances, repetitions, and unfilled pauses) than those of non-distressing memories. However, fragmentation was no different between the group with posttraumatic stress disorder and the group without posttraumatic stress disorder. The studies reviewed may be limited by small sample sizes.

**Coherence and Child Maltreatment Narratives**

It has been argued that trauma narratives involving child maltreatment are particularly difficult to integrate into people’s life stories because they often involve a violation of interpersonal relationships, are often chronic, and are less likely to be openly discussed and processed than other trauma events like the death of a loved one, a car accident, or a natural disaster (Greenhoot et al., 2013). As such, these events are often not well consolidated into memory, resulting in poor account of these experiences (Salmon & Reese, 2015). Furthermore, given that narrative skills are still developing in childhood, children may have difficulty making sense of the experience at the time of occurrence, as well as recounting the experience in a coherent, detailed, and emotionally regulated way (Salmon & Reese, 2015). The literature on the
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coherence of child maltreatment narratives, however, is very limited, and the few existing studies have mostly focused on child sexual abuse (Capella, 2017; Miragoli et al., 2017; Mossige et al., 2015). These studies found that narratives of child sexual abuse are less coherent than narratives of other stressful event (e.g., Mossige et al., 2005) and in those with posttraumatic stress disorder than without (Miragoli et al., 2017). Specifically, Mossige and colleagues (2005) studied 10 children referred to therapy and examined the narratives of their therapy transcripts, which were sorted into narratives about the sexual abuse event and narratives about other stressful events. Mossige and colleagues found that narratives of child sexual abuse were less elaborate, more disorganized, less contextually embedded, and less coherent than narratives of other stressful events. This study, however, is limited by the small sample size. In addition, Miragoli and colleagues (2017) recruited 86 children and adolescents with a history of child sexual abuse and interviewed participants about the sexual abuse event using semi-structured interviews. The authors found that the narratives of those who met the criteria for a diagnosis of posttraumatic stress disorder were less coherent than those who did not meet the diagnostic criteria.

Explaining Mixed Findings on the Coherence of Trauma Narratives

The literature on coherence is complicated by the inconsistent use of concepts and methodological approaches, which has likely resulted in mixed findings (Jelinek et al., 2009; O’Kearney & Perrot, 2006). For example, low coherence appears to be related to two constructs: fragmentation and disorganization. Foa and colleagues (1995) defined fragmentation as unnecessary repetitions and disorganization as confused or disjointed thoughts. In contrast, O’Kearney and Perrot (2006) conceptualized fragmentation as being reflected in a lack of narrative cohesion and coherence. Narrative cohesion focuses on additive, comparative, temporal, and causal relationships or connections between sentences or clauses, and narrative
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cohere focuses on the connections of goals, actions, and outcomes, topics, or event sequences. Similarly, Crespo and Fernández-Lansac (2016) identified two fragmentation dimensions consisting of disorganization, which encompasses specific structural elements, and incoherence, which is a global index of the degree to which the account is poorly articulated or incomprehensible. Furthermore, disorganization has also been referred to as the impaired capacity of individuals to create a consistent and coherent narrative of the self following a trauma event (Neimeyer et al., 2006). Although these constructs appear to overlap, the nuance difference among them may have led to the inconsistent findings.

In addition, different approaches have been used to elicit narratives, including the interview format and written narratives (e.g., Peace & Porter, 2004), which may partly account for the mixed findings. Coherence has been assessed using self-report measures, experimenter rating, and narrative-based content analysis (Halligan et al., 2003). Within narrative analysis studies, some researchers have analyzed narratives globally whereas others have examined each utterance of the narratives such as dividing each narrative into clauses containing only one thought, action, or speech utterance (Jelinek et al., 2009; O’Kearney & Perrott, 2006).

There is little overlap between participants’ self-reports of their memory qualities and the analysed components of their memory narratives, which may reflect the difference in the way autobiographical memories feel to people and how they recollect that memory (Greenhoot et al., 2013). In fact, self-report measures have been criticized because these responses are likely influenced by demand characteristics and may not correspond with actual performance (Brewin, 2014). Brewin (2007, 2016) argued that at the global level when people are producing general, well-rehearsed narratives that focus on the outline of the trauma story, trauma and non-trauma narratives are essentially similar in their levels of coherence. At the local, clause-by-clause,
utterance level, however, amnesic gaps, other types of fragmentation, and evidence of disorganized thoughts would become evident.

According to Jelinek and colleagues (2009), when ratings are based on utterance-level analysis and when certain methodological standards were met (e.g., including participants with and without posttraumatic stress disorder), findings indicate that trauma narratives are more disorganized in those with posttraumatic stress disorder (Halligan et al., 2003; Jelinek et al., 2009; Jones et al., 2007). In contrast, Rubin and colleagues (Rubin, 2011; Rubin et al., 2016) included several different measures of coherence in their studies and found that trauma narratives were less coherent than non-trauma narratives on some measures but not others. Specifically, Rubin and colleagues (2016) recruited 30 adults with and 30 adults without posttraumatic stress disorder and asked them to narrate trauma, positive, and important memories. They used 12 measures of coherence – three single items from the Autobiographical Memory Questionnaire (Rubin et al., 2003) that are relevant to narrative coherence; the three dimensions of context, chronology, and theme from the Narrative Coherence Coding Scheme (NaCCS; Reese et al., 2011); four single-item global coherence measures rated by coders assessing more abstract level of narrative abilities; Coh-Metrix (Graesser et al., 2004), a program that analyzes higher-level features of language and discourse; and Linguistic Inquire Word Count (LIWC; Pennebaker et al., 2007), which analyzes written or transcribed text and calculates the percentage of different types of words used, including cognitive mechanisms, insight, cause, non-fluencies, and filler words. Of these measures, narratives of trauma memories were less coherent than narratives of most important and most positive memories on the following: the items on the Autobiographical Memory Questionnaire, the theme dimension of the NaCCS, and Coh-Metrix deep cohesion, external temporal connectiveness, causal connectives, and logical connectiveness. In contrast,
narratives of trauma memories were more coherent than the narratives of the control memories on the following: the chronology dimension of the NaCCS, the coder-rating of global coherence of narrator, emotion, and percentage of writing relevant to the narrative development, Coh-Metrix concreteness, and LIWC cause. Rubin and colleagues (2016) concluded that there are no consistent patterns to these coherence measures. Although their study had a small sample size, Rubin and colleagues argued that based on power analysis, they had sufficient power to detect differences in coherence between the trauma and comparison memories.

Given that the subjective rating of coherence by participants themselves and the narrative coding of content for coherence by the researcher/coders may not be highly correlated (Greenhoot et al., 2013), both types of measures were used in the current study to assess the different features of coherence by different informants (i.e., self versus experimenter/coder). In addition to the conceptual and methodological explanations reviewed above, there are other variables suggested in the literature on narrative coherence that may be contributing to the inconsistent findings. These include level of ego development and posttraumatic stress symptoms, as described next.

**Ego Development and Narratives**

Individual differences in personality domains such as ego development may account for the ways in which people tell their autobiographical memories (Adler et al., 2007; Waters et al., 2018). Loevinger (1976) defined ego development as the overall frameworks that people use for making sense of their personal experiences and how they view the world. The levels of ego development represent different levels of maturity, with each successive level involving a more complex and differentiated way of making meaning out of experience. At the lower levels, people tend to interpret their experiences in highly egocentric and simplistic ways. These
individuals tend to prioritize stability and continuity in the life course and assimilate their understandings of self to societal conventions (Adler et al., 2007). In the middle levels, the frameworks that people use to understand the world become more differentiated and socialized, and people come to adopt many of society’s conventions. At the higher levels, people’s perspectives on the self, others, and the world are considerably more complex and nuanced and are guided by internalized, self-determining principles of life (Adler et al., 2007). These individuals tend to construe their lives as complex stories of personal transformation and growth. They tend to prioritize personal changes in their life stories, highlighting life scenes in which they experienced insights and explaining clearly the ways in which they have evolved, progressed, or developed over time (e.g., Adler et al., 2007; Bauer & McAdams, 2004; Bauer et al., 2005).

Ego development has been demonstrated to contribute to the narration of life stories. Adler and colleagues (2007) recruited 76 adults who had all been in psychotherapy in the past five years but were not currently receiving any form of treatment. They asked participants to write extensive narrative accounts about specific scenes during the course of their treatment, including their presenting problem, decision to seek therapy, important sessions, and ending or termination of therapy. They found that ego development was positively related to the coherence of participants’ narrative accounts. Furthermore, Labouvie-Vief and colleagues (1987) examined ego development, coping, and defense mechanisms in a sample of 100 people ranging from age 10 to 77 years. The authors found that ego level predicted the use of particular coping and defense strategies such that participants who scored lower on ego level were found to use maladaptive defences (i.e., turning against others and projection) and coping strategies (i.e., escape-avoidance and distancing) (Labouvie-Vief et al., 1987).
Beyond ego development, personality traits such as the Big Five (i.e., neuroticism, extraversion, openness to experience, consciousness, and agreeableness) may contribute to the narration of life stories (Adler et al., 2007). For example, the personality trait of openness to experience has been found to be related to individual differences in life stories (Adler et al., 2007; Pals, 2006; Waters et al., 2018). Specifically, compared to those low in openness to experience, people with high levels of openness to experience tend to value variety and change in life, to be more psychologically minded, and to express a good deal of complexity in their views and opinions, and this contributes to variability in life stories (Adler et al., 2007). Furthermore, McCrae and Costa (1980) documented significant positive associations between self-reported openness to experience and ego development. In the current study, personality traits were assessed and included as potential covariates.

Overall, how people make meaning of their life experiences and narrate them is clearly related to their ego development. In addition, as described earlier, traumatic life experiences such as child maltreatment are associated with symptoms of posttraumatic stress disorder. These symptoms, in turn, may also contribute to the level of narrative coherence.

Posttraumatic Stress Symptoms and Narratives

As described above, some researchers have argued that trauma narratives are less coherent in people with posttraumatic stress disorder than those without this disorder (e.g., Brewin, 2007, 2016). This is understandably so since symptoms of posttraumatic stress disorder such as avoidance, intrusion and dissociation, and negative alternation in cognitions and mood likely to negatively affect one’s ability to remember the trauma event (e.g., Halligan et al., 2003; Hayes et al., 2017; Valentino et al., 2009). The impact of some posttraumatic stress symptoms on trauma memory, especially those related to child maltreatment, can be understood through
Williams and colleagues’ (2007) CaR-FA-X model, which is used to explain overgeneral memory, defined as difficulty retrieving specific autobiographical memories. The CaR-FA-X model outlines several factors to account for overgeneral memory, including being “captured” (Ca) by negative self-presentation which interferes with memory search, rumination (R) or repetitive thinking about the self-related information, functional avoidance (FA), and impaired executive control (X) resulting in reduced processing resources and failure to inhibit irrelevant information. In fact, child maltreatment has been found to be associated with overgeneral memory (Valentino et al., 2009). On the other hand, others have also argued that narratives of trauma memory are no different than narratives of other autobiographical memory and no different between people with and without posttraumatic stress disorder (e.g., Rubin, 2011; Rubin et al., 2016). Given the mixed findings, it is possible that the variability in the specific posttraumatic stress symptoms (i.e., avoidance of trauma stimuli, intrusion and dissociation symptoms, and negative alterations in cognitions and mood) contributes to people’s ability to narrate their trauma events coherently. These symptoms are further described below.

**Avoidance of Trauma Stimuli.** Avoidance is defined as a regulation strategy that is characterized by distancing and disengagement from the stressful stimuli, such as trauma memories, cognitions, and emotions, to prevent psychological discomfort (Dalgleish et al., 2008; Hayes et al., 2017). Given the psychological distress associated with trauma reminders, individuals who engage in avoidant strategies may minimize the experience and not attempt to understand why the trauma occurred or to evaluate the impact of the trauma on themselves and their relationships with others. As such, their trauma narratives may be brief and fact-driven and characterized by low levels of elaboration, reflection, and cognitive restructuring that are
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required to construct adaptive meanings of the trauma experiences (Ehlers & Clark, 2000; Hayes et al., 2017).

Consistent with Williams and colleagues’ (2007) CaR-FA-X model, avoidance has been found to be associated with reduced memory specificity or overgeneral memory in trauma-exposed individuals (Dalgleish et al., 2008). Specifically, when victims of childhood trauma search their memories for a specific adverse childhood event, the memory search is truncated at general retrieval as a protective mechanism to avoid or attenuate the negative affect associated with the specific painful memory. As such, these recollected memories are characterized by generic descriptions that lacked contextual and/or temporal details, reflecting lower levels of coherence (e.g., Bunnell & Greenhoot, 2012; Hermans et al., 2005; Hayes et al., 2017; Ogle et al., 2013). Although avoidance can provide temporary relief from distress, it is not an effective long-term regulation strategy because it contributes to a rebound of intrusions, including nightmares, flashbacks, and rumination (Brewin et al., 2010; Gross & John, 2003; Hayes et al., 2015; Williams et al., 2007), as well as poor psychological functioning (Hayes et al., 2017; Shenk et al., 2014). In addition to the use of an avoidance strategy, intrusion and dissociation symptoms may be associated with people’s ability to coherently narrate their trauma experiences.

**Intrusion and Dissociation Symptoms.** When people experience highly traumatic events, they may protect themselves from the events by compartmentalizing the trauma events or through dissociation, which prevents memory processing and organization during encoding (Halligan et al., 2003; Miragoli et al., 2017; Williams, 1994). Although this may prevent individuals from recalling the entire trauma event coherently, these memories may be encoded in fragments and in the forms of vivid visual images, bodily sensations, emotions, and perceptual and sensory information such as sights, sounds, and smells associated with the events (Berntsen
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& Rubin, 2002; Halligan et al., 2003). These memories, in turn, may be retained at an unconscious level that may be more inaccessible to people’s conscious awareness, but also more immune to ordinary forgetting and may emerge in ways that are disruptive to the individuals’ functioning (Neimeyer et al., 2006; van der Kolk & Fisler, 1995). Although the perceptual and sensory stimuli associated with the trauma events may be remembered (Ehlers & Clark, 2000), some studies have found that some people with a history of child sexual abuse did not recall the content of such experiences as adults (e.g., Williams, 1994), as noted above. Furthermore, dissociation has been found to be associated with narrative fragmentation and disorganization (Halligan et al., 2003; Harvey & Bryant, 1999; Miragoli et al., 2017; van der Kolk & Fisler, 1995). As such, dissociation and subsequent intrusion symptoms may interfere with the coherence of trauma memories. Another factor that may affect narrative coherence of trauma memories is negative alterations in cognitions and mood.

**Negative Alterations in Cognitions and Mood.** The ability to hold favourable representations of self and maintain positive views of others are often disrupted in people with a history of child maltreatment (Capella, 2017; Cicchetti & Banny, 2014; Valentino et al., 2009). Child maltreatment often occurs in a hostile family environment whereby parents criticize children frequently and blame them for the mistreatment (Deblinger & Runyon, 2005; Tangney, 2002). Children in turn, may develop dysfunctional thoughts and self-blame and believe that they are deserving of the abuse as a way to make sense of the abuse, albeit ineffectively (e.g., “my stepdad makes me do sexual things because I am too sexy”) (Deblinger & Runyon, 2005, p. 367). Punitive parenting practices associated with child physical and emotional abuse, such as criticism, humiliation, and hitting, may induce feelings of shame in children, a debilitating emotion in which the self is viewed as incompetent, damaged, or unworthy, as well as an object
of ridicule, contempt, and/or disgust (Deblinger & Runyon, 2005; Stuewig & McCloskey, 2005; Tangney, 2002). These negative cognitions and emotional states may undermine adaptive self-representations and trigger maladaptive coping strategies, such as repetitive thinking about issues surrounding the trauma or cognitive avoidance (Ehlers & Clark, 2000).

The negative self-representation may also affect the encoding, organization, and retrieval of these memories (Valentino et al., 2009). Based on Williams and colleague’s (2007) CaR-FA-X model of overgeneral memory noted above, during memory search, some people are stuck at the level of retrieved negative self-representation and are unable to move beyond this level in their memory search. This process, in combination with rumination about self-related information, is proposed to lead to overgeneral memory through disrupting the retrieval of event-specific autobiographical knowledge (Williams et al., 2007). Indeed, negative self-representation, self-blame, and perceived negative reactions from others interfere with the ability to constructively process the trauma material (Simon et al., 2016), thereby likely lowering the coherence of such memories when narrated.

Overall, posttraumatic stress symptoms, such as high levels of avoidance, intrusion and dissociation symptoms, and negative cognitions and mood, may contribute to individual variation in the narrative coherence of traumatic memories, such as of child maltreatment. Furthermore, the extent to which these narratives are coherent is associated with outcome variables such as psychological distress and life satisfaction.

Outcomes of Psychological Distress and Life Satisfaction

Psychological Distress

As noted above, child maltreatment and narrative coherence are associated with individuals’ overall psychological distress and satisfaction with life (e.g., Baerger & McAdams,
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1999; Graci & Fivush, 2017; Herrenkohl et al., 2010; Jaffe, 2017). Psychological distress is defined as a range of mental health symptomology, including those associated with depression, anxiety, posttraumatic stress disorder, psychotic disorders, among others. A number of theories offer different perspectives on the etiology of psychopathology and psychological distress, including biological models, psychological models, sociocultural models, and multifactorial models. The diathesis-stress model is a multifactorial model that takes into consideration multiple factors that contribute to psychological distress. Based on this model, some people have a genetic predisposition that makes them more susceptible to stress than others, and this combined with the experience of a significant stressor, contributes to psychological distress (Zuckerman, 1999). Consistent with this model, numerous factors comprised of both genetic and environmental factors confer risks to psychological distress (Compas et al., 2017). Specifically in terms of child maltreatment, there are multiple mechanisms through which child maltreatment might increase the risks for psychological distress, including through its interaction with a genetic predisposition to psychopathology, changes in epigenetic markings and methylation patterns, alterations in brain structure and functions, blunted cortisol response to stress, negative attribution style, poor self-regulation, and negative self-concept (Jaffee, 2017), as well as possibly narrative incoherence or difficulty making meaning of such experiences (Capelle, 2017; Mossige et al., 2005). As noted above, there is evidence that child maltreatment and the lack of narrative coherence are associated with psychological distress (e.g., Graci & Fivush, 2017; Jaffee, 2017; Simon et al., 2010). In addition to psychological distress, which can be conceived as a negative outcome, the lack of child maltreatment experience and the presence of narrative coherence are associated with the positive outcome of life satisfaction.
Life Satisfaction

Whereas psychological distress is a negative aspect of psychological functioning, life satisfaction is conceptualized as an aspect of positive psychological functioning (Keyes et al., 2002). According to Diener and colleagues (1985), life satisfaction is a component of subjective well-being, along with positive affect and negative affect. Specifically, life satisfaction refers to the cognitive-judgmental component of subjective well-being, and positive and negative affect is the affective-emotional component of subjective well-being. Life satisfaction is dependent on the comparison that people make between their circumstances and a self-imposed standard (Diener et al., 1985). Although life satisfaction is considered to be moderately stable over a long period of time, it is susceptible to change depending on contextual circumstances (Lucas & Donnellan, 2007). Whereas child maltreatment is positively associated with psychological distress and narrative coherence is negatively associated with psychological distress, these relations are inversed for life satisfaction (e.g., Baerger & McAdams, 1999; Herrenkohl et al., 2010; McAdams et al., 2001; Pals, 2006; Sheikh et al., 2016). In addition, psychological distress is negatively associated with life satisfaction (Boyraz et al., 2014). As such, both psychological distress and life satisfaction were included as outcome variables in the current study to obtain a more comprehensive understanding of the effects of child maltreatment experiences.

Rationale and Purpose of the Present Study

Based on the narrative identity framework, people are continuously interpreting their experiences. Over time, these events contribute to a narrative identity that influences how people understand past and present events and interpret future events (McAdams, 2001). However, some events such as trauma exposure are so disruptive that these cannot be easily integrated into people’s life story (e.g., Capella, 2017; Pals, 2006), and this in turn is associated with an
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increased risk for psychopathology (Ehlers & Clark, 2000). Although some researchers have argued that there is no difference in the coherence level of trauma and non-trauma narratives (e.g., Rubin et al., 2016), many have posited that trauma narratives are less coherent than non-trauma narratives (e.g., Brewin, 2014; Ehlers & Clark, 2000). As reviewed above, a number of factors may lower how coherently people narrate their trauma, including symptoms of posttraumatic stress symptoms, such as using an avoidance strategy, experiencing intrusion and dissociation symptoms, and having negative self representations (e.g., Halligan et al., 2003; Hayes et al., 2017; Valentino et al., 2009). The purpose of the present study is to better understand the relation between trauma and narrative coherence by using a sample of adults in Canada who have experienced child maltreatment (sexual abuse, physical abuse, emotional abuse, physical neglect, emotional neglect). Specifically, the present study is designed to assess three research questions:

1) Are child maltreatment narratives less coherent than non-trauma narratives for the same person?

2) Do variables such as ego development and posttraumatic stress symptoms moderate the relation between child maltreatment and coherence of child maltreatment narratives?

3) Does coherence of child maltreatment narratives mediate the relation between child maltreatment and the outcome variables of psychological distress and life satisfaction?

In the current study, the rehearsal of the trauma event (e.g., Wright, 2011), retention interval of trauma event (e.g., Waters et al., 2013), social supports (e.g., Greenhoot et al., 2013), and personality traits (e.g., Adler et al., 2007), as discussed above, were examined as potential covariates due to their relations with autobiographical memory and narrative coherence. Additional potential covariates included academic performance as measured by self-reported
grade point average, length of narratives measured by the number of words in the narratives and reading level of narratives. These variables have been previously studied in trauma narratives and included in the current study due to their possible contribution to the narration of life stories and possible ability to account for differences in cognitive resources (Adler et al., 2007; Reese et al., 2011; Waters & Fivush, 2015).

**Research Questions and Hypotheses**

**Research Question 1**

Are child maltreatment narratives less coherent than non-trauma narratives? There is ongoing debate about whether trauma narratives are less coherent or no different than non-trauma narratives (e.g., Brewin, 2007; Jelinek et al., 2009; Rubin, 2011; Rubin et al., 2016). Nonetheless, many studies did find that trauma narratives are less coherent than non-trauma and/or positive event narratives (e.g., Halligan et al., 2003; Römisch et al., 2014; Vrana et al., 2019; Waters et al., 2013). When considering the narrative coherence of trauma occurring in childhood, and specifically experiences of child maltreatment, research is very limited to the author’s knowledge. These studies focused specifically on child sexual abuse in the child and adolescent population (e.g., Capella, 2017; Miragoli et al., 2017; Mossige et al., 2005). The findings of these studies supported the argument that trauma narratives are less coherent than non-trauma narratives. It is possible the trauma exposure is so disruptive that these individuals dissociate during trauma exposure and experience intrusion symptoms, avoid trauma stimuli, and have poor self representation, all of which impede their ability to process their trauma experience and to narrate a coherent account of their experience (e.g., Halligan et al., 2003; Hayes et al., 2017; Valentino et al., 2009). In addition, trauma involving child maltreatment may be particularly difficult to make sense of given that these occur at a younger age and when
children’s self-concepts are still forming, often involve violation of interpersonal relationships, and are less likely to be openly discussed and processed than other traumatic events (Greenhoot et al., 2013).

**Hypothesis 1.** Child maltreatment narratives will be less coherent (based on global coding of narrative content for context, chronology, and theme) than non-trauma narratives.

**Research Question 2**

Do variables such as ego development and posttraumatic stress symptoms moderate the relation between child maltreatment and coherence of child maltreatment narratives? As reviewed above, narratives of child maltreatment, specifically child sexual abuse, are associated with lower coherence level (Miragoli et al., 2017; Mossige et al., 2005). Symptoms of posttraumatic stress symptoms, such as using an avoidance strategy, experiencing intrusion and dissociation symptoms, and having negative self representations interfere with one’s ability to remember the trauma event (e.g., Halligan et al., 2003; Hayes et al., 2017; Valentino et al., 2009). Furthermore, ego development has also been found to be related to narrative coherence, such that higher ego levels are associated with more narrative coherence (Adler et al., 2007). Individual differences in the constructs measured by these variables may contribute to the relation between child maltreatment and narrative coherence, such that higher ego development and lower posttraumatic symptoms may be associated with higher coherence of maltreatment narratives.

In addition, as noted above, research on the coherence of maltreatment narratives is limited, and the few existing studies primarily focused on child sexual abuse (e.g., Miragoli et al., 2017; Mossige et al., 2005). As such, little is known about how other types of maltreatment are related to the coherence of such event narratives. It is possible that the different types of
NARRATIVE COHERENCE OF MALTREATMENT MEMORIES

abuse and neglect experienced affect how people narrate these events. For example, child sexual abuse may be associated with less narrative coherence when compared to other maltreatment types due to the associated sense of betrayal, self-blame, fear, and shame (Harris et al., 2016). The different types of maltreatment (sexual abuse, physical abuse, emotional abuse, physical neglect, emotional neglect) were also examined as a part of this research question.

The direct and moderation relations described are depicted as the models in Figure 1 and Figure 2 below. The predictor variable is child maltreatment (comprised of sexual abuse, physical abuse, emotional abuse, physical neglect, and emotional neglect). The moderator variables are 1) ego development and 2) posttraumatic stress symptoms (comprised of avoidance, intrusion and dissociation symptoms, and negative alterations in cognitions and mood). The outcome variable is coherence of child maltreatment narratives (comprised of global coding of context, chronology, and theme coherence, as well as subjective rating of memory disorganization). Two measures were used to assess narrative coherence, a narrative-based content analysis of global coherence (context, chronology, and theme) (Reese et al., 2011) and a self-report measure of memory disorganization (Halligan et al., 2003). Given previous finding that showed that experimenter coding of coherence did not correlate highly with self-report measure of coherence (Greenhoot et al., 2013), additional analysis was conducted to examine if global coding of coherence and subjective rating of memory disorganization are distinct variables; this is reported in the results section.

**Hypothesis 2a.** Ego development will moderate the relation between child maltreatment and coherence of maltreatment narratives (measured by global coding of context, chronology, and theme coherence and subjective rating of memory disorganization), with greater ego development resulting in higher levels of narrative coherence.
Figure 1

*Hypothesized Model for Research Question 2a*
Figure 2

Hypothesized Model for Research Question 2b

Narrative Coherence of Maltreatment Memories
Hypothesis 2b. Posttraumatic stress symptoms will moderate the relation between child maltreatment and coherence of maltreatment narratives (measured by global coding of context, chronology, and theme coherence and subjective rating of memory disorganization), with higher posttraumatic stress symptoms resulting in lower levels of narrative coherence.

In addition to the specified moderation relations, the direct relations between child maltreatment, ego development, and posttraumatic stress symptoms with narrative coherence were also assessed as a part of the models in Figure 1 and Figure 2. In particular, lower child maltreatment, higher ego development, and lower posttraumatic stress symptoms are expected to predict greater narrative coherence.

Research Question 3

Does coherence of child maltreatment narratives mediate the relations between child maltreatment and the outcomes of psychological distress and life satisfaction? The reviewed literature provided supports for the positive relations between the specified variables. First, child maltreatment was found to be associated with psychological distress (Jaffee, 2017). Second, child maltreatment (specifically child sexual abuse) was found to be related to lower narrative coherence (Miragoli et al., 2017; Mossige et al., 2005). Finally, narrative coherence was associated with low psychological distress (Pals, 2006). As such, narrative coherence may be a mechanism through which child maltreatment is linked to psychological distress. Similarly, child maltreatment is associated with low life satisfaction (e.g., Herrenkohl et al., 2012; Sheikh et al., 2016), and narrative coherence is associated with life satisfaction (e.g., Baerger & McAdams, 1999). As such, narrative coherence may also contribute to the relation between child maltreatment and life satisfaction. The ability to make meaning and establish coherence of trauma experiences appears to be important given its association with psychological well-being.
NARRATIVE COHERENCE OF MALTREATMENT MEMORIES

(e.g., Graci & Fivush, 2017). This ability is also implicated in trauma treatment interventions such as trauma-focused cognitive behavioural therapy (Cohen et al., 2006), prolonged exposure (Foa & Kozak, 1986), and cognitive processing therapy (Resick & Schnicke, 1992), as well as in expressive writing literature (e.g., Adler, 2012; Vrana et al., 2019). Furthermore, as noted above, only a few studies have examined child maltreatment (particularly child sexual abuse) and narrative coherence, and little is known about how different types of maltreatment affect people’s ability to narrate such experiences coherently.

The direct and mediated relations described are depicted as a model in Figure 3 below. In the model, the predictor variable is child maltreatment (comprised of sexual abuse, physical abuse, emotional abuse, physical neglect, and emotional neglect). The outcome variables are overall psychological distress and life satisfaction, which are expected to be correlated because a significant negative correlation between the two variables has been found in previous research (Boyraz et al., 2014). The mediator variable is coherence of child maltreatment narratives (comprised of global coding of context, chronology, and theme coherence, as well as subjective rating of memory disorganization); as noted above, this variable may be modelled as two distinct variables.

**Hypothesis 3.** Coherence of maltreatment narratives (measured by global coding of context, chronology, and theme coherence and subjective rating of memory disorganization) will mediate the relations between child maltreatment and outcome variables of psychological distress and life satisfaction.

In addition to the specified mediation relations, the direct relations between child maltreatment, narrative coherence, and outcome variables of psychological distress and life satisfaction were also assessed as a part of the model in Figure 3. Given the literature reviewed,
Figure 3

Hypothesized Model for Research Question 3

Child Maltreatment

- Sexual Abuse
- Physical Abuse
- Emotional Abuse
- Physical Neglect
- Emotional Neglect

Narrative Coherence (Maltreatment)

- Psychological Distress
- Life Satisfaction

Context (global coding)

Memory Disorganization (self-report)

Chronology (global coding)

Theme (global coding)
child maltreatment is expected to predict greater psychological distress and lower life satisfaction. Coherence of maltreatment narratives (measured by global coding of context, chronology, and theme coherence and subjective rating of memory disorganization) is expected to predict lower psychological distress and greater life satisfaction.
NARRATIVE COHERENCE OF MALTREATMENT MEMORIES

CHAPTER III

Method

Study Design

The present study used a quantitative, cross-sectional design to examine the relation between retrospective reports of childhood maltreatment and current narrative coherence in a sample of adults. All participants completed a series of online questionnaires (i.e., background information, child maltreatment, memory disorganization, psychological outcomes, life satisfaction, ego development, perceived social support, and personality traits). Participants were additionally asked to write narrative responses online to questions about a non-trauma, positive memory and a child maltreatment memory that occurred before the age of 15 years. The positive memory was added to control for valence and to ensure that coherence is specific to the maltreatment memory and not a general feature of autobiographical memory (e.g., Halligan et al., 2003; Jelinek et al., 2009; Rubin, 2011). The prompt to write events that happened before age 15 was designed to increase the probability that the types of maltreatment events narrated would be more thematically similar; however, all narrated maltreatment events that occurred at or before age 18 were included in data analysis. The narrative responses were coded based on an existing coding rubric for narrative coherence (Reese et al., 2011). This narrative-based content analysis of global coherence (context, chronology, and theme) and a self-report measure of memory disorganization are two of many ways to measure coherence and were chosen to assess some of the different ways that people’s autobiographical memories can be narrated.

Participants

Participants were those 17 years of age or older living in Canada who experienced one or more incidents of child maltreatment (e.g., sexual, physical, and emotional abuse and neglect). In
total, 250 responses from participants were generated in the online survey between November 2018 and July 2019. Of the 250 responses, 22 were incomplete. These 22 responses were likely duplicate responses rather than from new individuals and thus, they were omitted resulting in 228 participants. Of the 228 individuals, an additional 14 did not complete the survey, 9 individuals did not pass data screening (7 failed three or more of the five validity check questions, 2 failed one or two validity check questions and completed the survey in a short amount of time), and 1 individual completed the survey twice. The incomplete and invalid responses were removed from the study. See Figure 4 for the flowchart of participants in the study.

The final sample consisted of 204 participants from Ontario, Canada, 154 of which were recruited from a midsize university, 38 of which were recruited from a community college, and 12 of which were recruited from the community. This sample size is consistent with the power analysis calculated based on Satorra and Saris (1985) (https://webpower.psychstat.org/models/sem02), with a significance level of .05, power of .8, and effect size of .15, as well as using the formula \[ p(p+1)/2-q \] to determine degrees of freedom. Participants’ age ranged from 17 to 57 (\( M = 25.52, \ SD = 8.50 \)). Of these participants, 159 (77.9%) identified as female, 40 (19.6%) identified as male, 2 (1%) identified as gender non-binary, and 1 (.5%) identified as trans. The majority of participants identified as Caucasian/European (\( n = 126, 66.7\% \)), and other ethnicities included Asian/Pacific Islander (\( n = 30, 14.7\% \)), Arab/Middle Eastern (\( n = 12, 5.9\% \)), Black/African/Caribbean (\( n = 11, 5.4\% \)), Hispanic/Latino(a) (\( n = 6, 2.9\% \)), and Mixed (\( n = 9, 4.4\% \)). Finally, the highest educational institution attended by the majority of participants was university (\( n =157, 77.0\% \)), followed by community college (\( n = 35, 17.2\% \)), and then graduate school (\( n = 12, 5.9\% \)). Table 1 displays the breakdown of the demographic characteristics by
Figure 4

Flowchart of Participants in the Study

250 total responses collected

- 22 incomplete, duplicate responses

228 individual responses

- 14 incomplete responses

214 complete, individual responses

- 9 did not pass data screening
- 1 duplicate response

204 valid responses

- 6 missing responses
- 5 missing responses
  - 6 narrated a trauma event
  - 1 narrated a hearsay event

198 valid responses for trauma narratives

192 valid responses for positive event narratives
Table 1

Participant Demographic Characteristics (N = 204)

<table>
<thead>
<tr>
<th>Variable</th>
<th>University (n = 154)</th>
<th>Community College (n = 38)</th>
<th>Community (n = 12)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Sex</td>
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<tr>
<td>Female</td>
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<tr>
<td>Male</td>
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<td>18.2</td>
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<td>Gender non-binary</td>
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<td>1.3</td>
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</tr>
<tr>
<td>Trans</td>
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<td>0.6</td>
<td>0</td>
</tr>
<tr>
<td>Ethnicity</td>
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<tr>
<td>Caucasian/European</td>
<td>104</td>
<td>67.5</td>
<td>25</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>21</td>
<td>13.6</td>
<td>5</td>
</tr>
<tr>
<td>Arab/Middle Eastern</td>
<td>9</td>
<td>5.8</td>
<td>2</td>
</tr>
<tr>
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<td>7.1</td>
<td>0</td>
</tr>
<tr>
<td>Hispanic/Latino(a)</td>
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<td>2.6</td>
<td>2</td>
</tr>
<tr>
<td>Mixed</td>
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<td>3.2</td>
<td>4</td>
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<td>Highest Level of</td>
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<tr>
<td>Educational Institution</td>
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<td></td>
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<tr>
<td>Attended</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>College</td>
<td>0</td>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>University</td>
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<td>95.5</td>
<td>6</td>
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<tr>
<td>Graduate School</td>
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<td>4.5</td>
<td>2</td>
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<td>Family Annual Income</td>
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<tr>
<td>70,000 or more</td>
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<td>32.5</td>
<td>8</td>
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<tr>
<td>60,000 to 69,999</td>
<td>8</td>
<td>5.2</td>
<td>2</td>
</tr>
<tr>
<td>50,000 to 59,999</td>
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<td>7.1</td>
<td>3</td>
</tr>
<tr>
<td>40,000 to 49,999</td>
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<td>7</td>
</tr>
<tr>
<td>30,000 to 39,999</td>
<td>11</td>
<td>7.1</td>
<td>2</td>
</tr>
<tr>
<td>Below 30,000</td>
<td>37</td>
<td>24.0</td>
<td>8</td>
</tr>
<tr>
<td>I do not know or do not</td>
<td>26</td>
<td>16.9</td>
<td>8</td>
</tr>
<tr>
<td>wish to answer</td>
<td></td>
<td></td>
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</tr>
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</table>
group: university, community college, and the community. In addition, analysis of variance (ANOVA) test revealed that the groups did not differ in their experiences of child maltreatment (sexual abuse, physical abuse, emotional abuse, physical neglect, emotional neglect) and narrative coherence (context, chronology, theme) \( (p = .08-.81) \).

**Measures**

Table 2 presents a list of the measures that were used in the present study and the variable names used in subsequent sections. Permissions to use the measures, if needed, were granted by the measures’ respective authors via email. All measures were completed online.

**Background Information Questionnaire**

Participants completed a demographic information questionnaire, including questions about their age, gender, ethnicity, year and program of enrolment, grade point average, family annual income, and treatment history (see Appendix A).

**Child Maltreatment: Childhood Trauma Questionnaire-Short Form**

Participants’ experiences of child maltreatment (e.g., sexual, physical, and emotional abuse and neglect) were measured by the Childhood Trauma Questionnaire-Short Form (CTQ-SF; Bernstein & Fink, 1998; Bernstein et al., 2003), a retrospective self-report measure of the extent of different types of abuse and neglect experienced in childhood. It was developed from the original 70-item self-report inventory using factor analyses (Bernstein et al., 1994). The CTQ-SF was validated using combined data from seven different samples (Bernstein & Fink, 1998) and was found to be applicable across clinical and non-clinical samples (Bernstein et al., 2003). Bernstein and Fink (1998) reported that the measure has high internal consistencies with alpha coefficients ranging from .84 to .95; test-retest reliabilities ranging from .78 to .86; convergent validity with measures of posttraumatic stress disorder, dissociation, alexithymia, and
## NARRATIVE COHERENCE OF MALTREATMENT MEMORIES

### Table 2

**List of Measures**

<table>
<thead>
<tr>
<th>Measure Name</th>
<th>Variables</th>
<th>Items</th>
<th>Duration</th>
<th>Contribution</th>
<th>Permission</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Narrative Coding of Memories</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Narrative Coherence Coding Scheme (NaCCS; Reese et al., 2011)</td>
<td>Narrative coherence (global level content analysis: context, chronology, theme)</td>
<td>--</td>
<td>--</td>
<td>DV (RQ1-2); Mediator (RQ3)</td>
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<tr>
<td><strong>Questionnaires</strong></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Background Questionnaire</td>
<td>Age, ethnicity, gender, GPA, etc.</td>
<td>8</td>
<td>1 min</td>
<td>Covariates</td>
<td>--</td>
</tr>
<tr>
<td>Childhood Trauma Questionnaire – Short Form (CTQ-SF; Bernstein &amp; Fink, 1998; Bernstein et al., 2003)</td>
<td>Child maltreatment (sexual, physical, and emotional abuse, physical and emotional neglect)</td>
<td>28</td>
<td>5 mins</td>
<td>IV (RQ1-3)</td>
<td>*</td>
</tr>
<tr>
<td>Traumatic Memory Questionnaire (TMQ; Halligan et al., 2003)</td>
<td>Memory disorganization (one of the measures for narrative coherence)</td>
<td>13</td>
<td>2 min</td>
<td>DV (RQ1-2); Mediator (RQ3)</td>
<td>Yes</td>
</tr>
<tr>
<td>Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1983)</td>
<td>Psychological distress (global severity index)</td>
<td>90</td>
<td>12-15 mins</td>
<td>DV (RQ3)</td>
<td>*</td>
</tr>
<tr>
<td>Satisfaction with Life Scale (SWLS; Diener et al., 1985)</td>
<td>Life satisfaction</td>
<td>5</td>
<td>1 min</td>
<td>DV (RQ3)</td>
<td>*</td>
</tr>
<tr>
<td>Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5; Weathers et al., 2013)</td>
<td>Posttraumatic stress disorder symptoms (avoidance of trauma stimuli, intrusion and dissociation symptoms, negative alterations in cognitions and mood)</td>
<td>20</td>
<td>5 mins</td>
<td>Moderators (RQ2)</td>
<td>*</td>
</tr>
<tr>
<td>Sentence Completion Test of Ego Development (SCT; Hy &amp; Loewinger, 1996)</td>
<td>Ego development</td>
<td>18</td>
<td>5-10 minutes</td>
<td>Moderator (RQ2)</td>
<td></td>
</tr>
<tr>
<td>Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988)</td>
<td>Perceived social support (from family, friends, and significant other)</td>
<td>12</td>
<td>2 mins</td>
<td>Covariate</td>
<td>*</td>
</tr>
<tr>
<td>Big Five Inventory (BFI; John et al., 1991; John &amp; Srivastava, 1999)</td>
<td>Personality traits (openness, conscientiousness, extraversion, agreeableness, and neuroticism)</td>
<td>44</td>
<td>5 mins</td>
<td>Covariates</td>
<td>*</td>
</tr>
</tbody>
</table>

*Note.* Permission is not required for research purposes, as indicated on the author’s website (SWLS, PCL-5, MSPSS, BFI) or via the University of Windsor psycTESTS Portal (CTQ-SF, SCL-90-R). RQ = Research Question; DV = Dependent Variable; IV = Independent Variable.
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depression; and discriminant validity with measures of vocabulary and social desirability. This measure has been found to be suitable for use with clinical and non-clinical population over the age of 12 years (Bernstein & Fink, 1998).

The CTQ-SF is comprised of 28 items – five items for each of the five subscales and three validity items assessing minimization/denial (Bernstein & Fink, 1998). The subscales are sexual abuse (e.g., “someone tried to touch me in a sexual way or make me touch them”), physical abuse (e.g., “I was punished with a belt, board, cord, or some other hard object”), emotional abuse (e.g., “people in my family said hurtful and insulting things to me”), physical neglect (e.g., “I had enough to eat”), and emotional neglect (e.g., “people in my family didn’t seem to know or care what I was doing”). Participants rate on a five-point Likert scale (1 = “never true”, 5 = “very often true”) the frequency with which each of the items occurred in their childhood. For the present study, the Cronbach’s alpha values for physical abuse, sexual abuse, emotional abuse, emotional neglect, and physical neglect were .86, .95, .83, .87, and .73, respectively.

Memory Disorganization: Traumatic Memory Questionnaire

Participants’ memory coherence was captured by the Traumatic Memory Questionnaire (TMQ; Halligan et al., 2003), a self-report measure of deficits in intentional recall (disorganization) and intrusions characterized by a wide range of phenomenological details associated with the memory. Both the disorganization and intrusion subscales of the TMQ have been found to have good internal consistency (α = .88-.90) (Halligan et al., 2003), and the items on the measure have been demonstrated to relate to cognitive processing and posttraumatic stress symptoms (Halligan et al., 2002). The intrusion items correlated highly with intrusive symptoms.
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(Halligan et al., 2003), and the disorganization items correlated $r = .48$ with disorganization based on narrative ratings (Halligan et al., 2006).

The TMQ is comprised of 13 items, five of which are designed to measure memory disorganization (e.g., “I cannot get what happened during the assault straight in my mind”), and the remaining eight items are designed to measure memory intrusions (e.g., “the feelings I had during the assault keep coming back to me”). Participants respond to each item on a five-point Likert scale (0 = “not at all”, 4 = “very strongly”) the extent to which the statements apply to them. The Cronbach’s alpha values for memory disorganization and memory intrusions in this study were .94 and .88, respectively. For the present study, only the disorganization subscale was scored to capture participants’ self-report of memory disorganization on the trauma event (not the positive event), as this subscale was used as one of the indicators of narrative coherence.

Psychological Distress: Symptom Checklist-90-Revised

Participants’ psychological distress was measured by the Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1983), a self-report symptom inventory designed to capture a broad range of psychological symptoms. The SCL-90-R was validated on four samples consisting of adult psychiatric outpatients, adult psychiatric inpatients, adult non-patients, and adolescent non-patients. Since its development, there is extensive research on this measure supporting its validity and reliability. The measure has internal consistencies ranging from .78 to .97 (Schmitz et al., 2000).

The SCL-90-R is comprised of 90 items and nine symptom dimensions: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, agoraphobic anxiety, paranoid ideation, and psychoticism. The somatization subscale consists of 12 items (e.g., “headaches”); the obsessive-compulsive subscale consists of 10 items (e.g., “repeated
unpleasant thoughts”); the interpersonal sensitivity subscale consists of nine items (e.g., “feeling critical of others”); the depression subscale consists of 13 items (e.g., “feeling low in energy or slowed down”); the anxiety subscale consists of 10 items (e.g., “nervousness or shakiness inside”); the hostility subscale consists of six items (e.g., “feeling easily annoyed or irritated”); the phobic anxiety subscale consists of seven items (e.g., “feeling afraid in open spaces or in streets”); the paranoid ideation consists of six items (e.g., “feeling others are to blame for troubles”); and the psychosis subscale consists of 10 items (e.g., “idea that someone else can control your thoughts”). The remaining seven items are not counted toward the subscale scores and instead contribute to the global scores of the measure. For each of the items, participants indicate on a five-point Likert scale (0 = “not at all”, 4 = “extremely”) the extent to which they experience the distress indicated on the items. For the present study, the Cronbach’s alpha values for the subscales are as follows: somatization (.91), obsessive-compulsive (.87), interpersonal sensitivity (.85), depression (.92), anxiety (.89), hostility (.83), phobic anxiety (.84), paranoid ideation (.73), and psychosis (.84). Three global indices are also derived from the measure: global severity index measures the overall level of psychological distress; positive symptom distress index measures the intensity of symptoms; and positive symptom total measures the number of self-reported symptoms. For the current study, only the global severity index, the average of all 90 items and the best suggested indicator of level of disorder, was used to represent psychological distress. The Cronbach’s alpha value for all 90 items was .98.

**Life Satisfaction: Satisfaction with Life Scale**

Participants’ degree of life satisfaction was measured by the Satisfaction with Life Scale (SWLS; Diener et al., 1985), a self-report measure of satisfaction with life as a whole. This measure was originally developed and validated using three samples, two of which were
NARRATIVE COHERENCE OF MALTREATMENT MEMORIES

comprised of undergraduate students \((N = 176\) and \(N = 163\), respectively) and the third was comprised of a community sample of 53 elders \((M_{\text{age}} = 75)\) (Diener et al., 1985). The SWLS has been found to be a valid and reliable measure of life satisfaction across age groups and applications (Pavot et al., 1991). The measure showed higher convergence validity with self- and peer-reported measures of subjective well-being (Pavot et al., 1991) and discriminant validity from emotional well-being measures (Pavot & Diener, 1993), as well as correlated adequately with interviewer ratings of life satisfaction \((r = .73)\) (Diener et al., 1985). The measure has high alpha coefficients \((\alpha = .85-.87)\), and test-retest reliabilities are .84, .84, and .82 for two weeks, one month, and two months, respectively (Diener et al., 1985; Pavot et al., 1991).

The SWLS is comprised of 5 items (e.g., “in most ways my life is close to ideal”). Participants rate on a seven-point Likert scale \((1 = \text{“strongly disagree”}, 7 = \text{“strongly agree”})\) the extent to which they agree with each of the statements. Possible scores on this measure range from 5 to 35, with scores within the 5 to 19 range indicating extremely to slightly dissatisfied and 21 to 35 range indicating slightly to extremely satisfied. For the present study, the total score was used as a continuous measure. The Cronbach’s alpha value for life satisfaction in the present study was .87.

**Posttraumatic Stress Symptoms: Posttraumatic Stress Disorder Checklist for DSM-5**

Participants’ posttraumatic stress symptoms (avoidance of trauma stimuli, intrusion and dissociation symptoms, negative alterations in cognitions and mood) were measured by the Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5; Weathers et al., 2013), a self-report measure that assesses the presence and severity of posttraumatic stress symptoms. It was developed from the original PCL that was comprised of 17 items corresponding to the posttraumatic stress symptom criteria in the Diagnostic and Statistical Manual of Mental
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Disorders (DSM), fourth edition (DSM-IV) (Blevins et al., 2015). The PCL was revised to reflect the DSM-5 changes to the posttraumatic stress disorder criteria. The PCL-5 was validated using two samples of trauma-exposed undergraduate students ($N = 278$ and $N = 558$, respectively) (Blevins et al., 2015). It has been found to have strong internal consistency ($\alpha = .94$), test-retest reliability ($r = .82$), and convergent and discriminant validity (Blevins et al., 2015).

The PCL-5 is comprised of 20 items. Items 1 to 5 reflect Criteria B symptoms of the DSM-5 criteria for posttraumatic stress disorder (intrusion symptoms, including dissociative reactions; e.g., “repeated, disturbing, and unwanted memories of the stressful experience”); items 6 to 7 reflect Criterion C symptoms (avoidance of trauma stimuli; e.g., “avoiding memories, thoughts, or feelings related to the stressful experience”); items 8 to 14 reflect Criterion D symptoms (negative alterations in cognitions and mood; e.g., “having strong negative beliefs about yourself, other people, or the world”); and items 15 to 20 reflect Criterion E symptoms (marked alterations in arousal and reactivity; e.g., “feeling jumpy or easily startled”) (Weathers et al., 2013). Participants rate on a five-point Likert scale (0 = “not at all”, 4 = “extremely”) how bothered they have been by each item in the past month. Scores of 2 (“moderately”) or higher on at least one question within each category indicate symptom endorsement. A score for each of the symptom categories (except Criterion E – marked alterations in arousal and reactivity) was computed by summing the respective scores. Total scores range from 0 to 80, and a total score of 33 or higher indicates provisional posttraumatic stress disorder diagnosis and recommendation for further assessment to confirm diagnosis (Weathers et al., 2013). For the present study, the Cronbach’s alpha values for intrusion symptoms, avoidance of trauma stimuli, negative alterations in cognitions and mood, and marked alterations in arousal and reactivity were .87, .83, .89, and .85, respectively.
Ego Development: Washington University Sentence Completion Test of Ego Development-Short Form

Participants’ ego development was measured using the Washington University Sentence Completion Test of Ego Development-Short Form (SCT short-form; Hy & Loewinger, 1996; Loewinger, 1985), a sentence completion test for measuring ego development. The SCT was originally developed for use with women, and although new forms for men and both men and women were developed, there were criticisms about the comparability of the items for the genders (Loewinger, 1985). The revised version of the SCT, validated using 11 samples consisting of undergraduate students, graduate students, parents, spouses, and inmates (total N = 804), was created to address this concern (Loewinger, 1985). The short-form version of the SCT was developed from this revised version. The SCT is supported by a large and robust body of research. A review study revealed that the measure has strong construct and discriminant validity (Manners & Durkin, 2001), and the measure has high interrater reliability when scoring manuals are used (α = .91) (Loewinger, 1998).

The short-form version of the SCT is comprised of 18 sentence stems for men and women (e.g., “My main problem is…”, “If I can’t get what I want…”) (Hy & Loewinger, 1996). The two forms primarily differ in terms of the pronouns used (“he” versus “she”). Each item is scored according to established guidelines, aggregated, and assigned a Total Protocol Rating (TPR), which corresponds to different levels of ego development. The nine levels in successive order, are presocial, impulsive, self-protective, self-aware, conformist, conscientious, individualistic, autonomous, and integrated (Hy & Loewinger, 1996). For the present study, participants’ responses on the SCT-short form were coded independently by two trained raters. The TPR scores were used as continuous interval data, a scoring method used by previous
NARRATIVE COHERENCE OF MALTREATMENT MEMORIES

researchers (e.g., Bauer & McAdams, 2004; Bauer et al., 2005). For the present study, the percentage of agreement for the TPR between the two raters was 66%, and the intraclass correlation for the TPR between the two raters was .87. All discrepant ratings on the TPR were resolved through discussions.

Perceived Social Support: Multidimensional Scale of Perceived Social Support

Participants’ perceived social support was measured by the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988), a self-report measure of people’s own appraisal of the adequacy of their social support from family, friends, and significant other. The measure was validated on different samples, including 275 university students, 265 pregnant women, 74 adolescents living in Europe with their families, and 55 pediatric residents (Zimet et al., 1988; Zimet et al., 1990). The MSPSS has good internal consistency ($\alpha = .85-.91$) and test-retest reliability ($\alpha = .72-.85$), as well as construct validity (e.g., negatively correlated with reported depression and anxiety symptoms) (Zimet et al., 1988; Zimet et al., 1990).

The MSPSS is comprised of 12 items with three subscales: family, friends, and significant other. Each of the subscales consists of four items (e.g., family: “my family really tries to help me”; friends: “I can count on my friends when things go wrong”; significant other: “there is a special person who is around when I am in need”). Participants rate on a seven-point Likert scale (0 = “very strongly disagree”, 7 = “very strongly agree”) the extent to which they agree with the statements. Subscale scores are determined by calculating the mean of all respective items, and total score is determined by calculating the mean score for all 12 items. According to Zimet and colleagues (1998), a total score ranging from 1 to 2.9 could be considered low support, 3 to 5 could be considered moderate support, and 5.1 to 7 could be considered high support. The Cronbach’s alpha values for the family, friends, and significant
others subscales in the current study were .92, .95, and .96, respectively, and the Cronbach’s alpha value for all 12 items was .88. For the present study, the total score was used.

**Personality Traits: The Big Five Inventory**

Participants’ personality traits were measured by the Big Five Inventory (BFI; John et al., 1991; John & Srivastava, 1999), a self-report measure of the prototypical components of the Big Five personality traits. The items on the measure were developed through expert ratings and subsequent factor analyses and used short phrases with relatively accessible vocabulary. Despite the brevity of this personality measure, it has good validities and reliabilities. The BFI showed good convergent and discriminant validity with other Big Five instruments as well as with peer ratings (John & Srivastava, 1999). In Canadian and American samples, the alpha coefficients range from .75 to .90 with a mean of above .80, and three-month test-retest reliabilities range from .80 to .90 with a mean of .85 (John & Srivastava, 1999).

The BFI is comprised of 44 items – eight items measuring extraversion (e.g., “is outgoing, sociable”); nine items measuring agreeableness (e.g., “likes to cooperate with others”); nine items measuring conscientiousness (e.g., “makes plans and follows through with them”); eight items measuring neuroticism (e.g., “gets nervous easily”); and 10 items measuring openness (e.g., “likes to reflect, play with ideas”). Participants rate on a five-point Likert scale (0 = “disagree strongly”, 5 = “agree strongly”) the extent to which they agree with each of the statements. Subscale scores are calculated by averaging the respective item scores for each of the subscales, and this scoring method was used in the present study. The Cronbach’s alpha values for the present study are as follows: extraversion (.86), agreeableness (.77), conscientiousness (.78), neuroticism (.85), and openness (.76).
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_Narrative Task: Trauma and Non-Trauma_

In addition to the measures noted above, participants were first asked to narrate a memory of a positive event (non-trauma) (see Table 3 below) and then a memory of child maltreatment (trauma) (see Table 4 below), both before the age of 15. Participants were asked to narrate a positive event memory first to ease them into the narrative task before narrating a trauma event. The positive event memory was elicited to control for valence (e.g., Römisch et al., 2014; Rubin, 2011; Sermpezis & Winter, 2009; Waters et al., 2013). Specifically, participants were asked to provide as much detail as possible about each of the positive event and child maltreatment memories (prompts taken directly from Waters & Fivush, 2015). Participants were also asked to answer specific questions about the extent to which they have thought or talked about this event (rehearsal of event) and the date that the memories occurred (retention interval), which were adapted from the Autobiographical Memory Questionnaire (Rubin et al., 2008). Rehearsal of event and retention interval were collected as potential covariates and were included in the data analyses only if they correlated significantly with narrative coherence. The final question, which asked participants about what they look forward to, was intended to neutralize mood (Braun & Clarke, 2013). Furthermore, the reading level and word length of these responses were also calculated as potential covariates, as noted above.

The narratives of the positive event and maltreatment memories were coded independently by two trained raters for the degree of coherence based on the Narrative Coherence Coding Scheme (NaCCS; Reese et al., 2011), which has been used in previous trauma studies (e.g., Greenhoot et al., 2013; Rubin, 2011; Rubin et al., 2016). The raters were also blind to the study hypotheses. One of the raters was a recent graduate with a bachelor’s degree in psychology who had previous experience coding for coherence based on the NaCCS, and the
Table 3

Narrative of Positive (Non-Trauma) Memory

Instructions: Take a moment to think about a personal memory that you have about one event before you were 15 years old in which you experienced positive feelings.

<table>
<thead>
<tr>
<th>When did this event occur?</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>less than 1 year ago</td>
</tr>
<tr>
<td></td>
<td>1-2 years ago</td>
</tr>
<tr>
<td></td>
<td>3-4 years ago</td>
</tr>
<tr>
<td></td>
<td>5-10 years ago</td>
</tr>
<tr>
<td></td>
<td>more than 10 years ago</td>
</tr>
</tbody>
</table>

Since this event happened, how much have you thought or talked about this event on a scale of 0 to 7 (0 = “not at all”, 7 = “very much”)?
Table 4

Narrative of Child Maltreatment (Trauma) Memory

Instructions: Take a moment to think about a personal memory that you have about one event before you were 15 years old in which you experienced physical, emotional, or sexual abuse or neglect by an adult.

As you write about the event you have in mind please describe, in detail, what happened, where you were, who was involved, what you did, and what you were thinking and feeling during the event. Also, try to convey what impact this [single unique or recurring] event has had on you, and why it is an important event in your life. Try to be specific and provide as much detail as you can (Waters & Fivush, 2015).

To keep your description anonymous for data analysis once your identifying information has been removed, please refer to others by their roles (e.g., teacher, friend) or relationship (e.g., parent, sibling) to you rather than by names.

Now that you have written your description of the event, please respond to the following questions:

a) Approximately how long ago did this event occur?
   
   __ less than 1 year ago
   __ 1-2 years ago
   __ 3-4 years ago
   __ 5-10 years ago
   __ more than 10 years ago

b) Since this event happened, how much have you thought or talked about this event on a scale of 0 to 7 (0 = “not at all”, 7 = “very much”)?

b) Take a moment now to think about your plans for the next year. What are you most looking forward to in the next year?
other rater was a senior psychology undergraduate student who did not have previous coding experience. The training included several steps. First, both raters were asked to read the article, including the coding rubric by Reese and colleagues (2011). Second, the novice rater was separately trained to code for the coherence indices, through coding practices and meeting with the author on three occasions to discuss the coding process. Third, both raters independently coded the narratives from the present study on a weekly basis, first 10 narratives (half of which were child maltreatment narratives and the other half were positive event narratives), then 20 narratives, then 30 narratives, and then another 30 narratives. Their ratings were compared to the author’s ratings during weekly meetings, and any discrepancies were resolved through discussion. Once the raters had similar ratings and/or similar understanding of the coding rubric, they were asked to independently code the remaining of the narratives without the author. They then coded 20-30 narratives per week, and weekly meetings occurred with the author to discuss and resolve any discrepant ratings.

Based on the NaCCS, participant responses were coded on three different dimensions using a four-point scale (0-3): context, chronology, and theme (Reese et al., 2011). Reese and colleagues (2011) provided examples of levels of narrative coherence based on the NaCCS. As noted above, the context dimension refers to the time and place of the event. A score of 0 point was assigned if participants did not mention time or place; a score of 1 point was assigned if participants included information about either time or place; a score of 2 points was assigned if participants included both pieces of information, but one of which was vague; and a score of 3 points was assigned if participants fully specified the time and place of events. The chronology dimension refers to the temporal order of actions included in the narratives. A score of 0 point was assigned if participants did not or minimally included information about the order of events;
a score of 1 point was assigned if less than 50 percent of the actions could be ordered along a timeline; a score of 2 points was assigned if 50 to 75 percent of the actions could be ordered; and a score of 3 points was assigned if greater than 75 percent of the relevant actions could be temporally ordered (Reese et al., 2011). Finally, the theme dimension refers to the elaboration and meaning-making aspect of the narrative. A 0 point was assigned if the narratives were substantially off topic or lacked an apparent point; a score of 1 was assigned if the narratives had an identifiable topic, but the topic was not elaborated, evaluated, or causally linked; a score of 2 points was assigned if the narratives were substantially developed via elaboration, evaluations, interpretations, and causal linkages; and a score of 3 points was assigned if the narratives included all of the components for 2 points, but also incorporated a resolution to the story or conflict, such as connecting the event to other personal experiences, future experiences, or self-concept or identity (Reese et al., 2011).

Some adjustments and observations regarding the coding are noteworthy. First, some participants narrated more than one event, despite the narrative prompt to share one event only. For these narratives, the event that resulted in the highest coherence ratings was selected for analysis. Second, some narratives were short (e.g., a couple of sentences), but it was possible for these narratives to achieve a high rating on the chronology dimension, given that the coding was based on the percentage of the actions noted that followed a temporal order. Although these narratives may not appear coherent on face value, a decision was made to follow the coding rubric, which given its brevity, precluded a possible lower score. Finally, it is important to note that one participant received a score of zero on the theme dimension, which likely reflected the narrative prompt which directly asked participants to write about a trauma event. This appears to be specific to the current study.
Reese and colleagues (2011) assessed the validity of this measure by demonstrating that the three components of coherence (context, chronicity, and theme) are distinct dimensions, the three components showed different patterns of development across ages (as described above), and that narrative coherence is an independent construct from other aspects of linguistic skills. The authors reported the average interrater reliabilities across each pair of coders among six coders, which were .80 (range of .70-.90) for context, .82 (range of .60-.90) for chronology, and .89 (range of .74-.94) for theme. For the present study, the intraclass correlations for the maltreatment narratives between the two raters were .93, .84, and .86, respectively for context, chronology, and theme coherence. For the positive event narratives, the intraclass correlations were .89, .82, and .84, respectively, for context, chronology, and theme coherence.

**Procedure**

After obtaining ethics clearance from the St. Clair College and University of Windsor Research Ethics Boards, the study became available online via the Qualtrics platform for interested individuals from 1) University of Windsor, 2) St. Clair College, and 3) communities in Ontario. First, individuals from the University of Windsor were recruited either through an advertisement posted on the Department of Psychology participant pool online platform (see Appendix B) or email from their department secretary (see Appendix C). Those from the participant pool were first asked to indicate their eligibility by responding to the screener question that outlines the inclusion criterion, which is the experience of one or more incidents of child maltreatment before the age of 15 such as physical abuse that causes bodily harm, emotional abuse such as verbal assaults on the sense of worth, sexual abuse such as unwanted sexual contact or conduct perpetrated by an older person, or neglect such as not having adequate food, clothing, or shelter. In addition, individuals from St. Clair College were recruited through
an announcement posted on their Blackboard site by the college’s Information Technology department (see Appendix D). Potential participants from the University of Windsor and St. Clair College were able to access the online survey directly, as the survey link was posted on the recruitment advertisement. Finally, individuals from the communities in Ontario were recruited through flyers posted in community organizations in Windsor, on Facebook (see Appendix E), as well as through word-of-mouth. Based on participant responses, the latter two sources were individuals from Ontario. Given that anybody could access the community recruitment advertisement, the survey link was not posted on the advertisement to safeguard against fraudulent responses, and interested individuals were asked to contact the researcher for a single-use study link. All advertisements noted the inclusion criterion stated above and that they would be asked about child maltreatment experiences and to refrain from participating if they had any concerns. Furthermore, once participants accessed the online survey, they were first presented with the inclusion criterion, to which they had to indicate “yes” before they could proceed. Those who indicated “no” were directed to the last page of the survey and presented with the debriefing form and community and campus mental health resources.

Depending on where they were recruited from, participants were compensated differently for their time. Those recruited through the University of Windsor Participant Pool were awarded one bonus point, provided that they 1) registered in the university participant pool, 2) enrolled in one or more eligible courses, and 3) achieved at least 60% correct (i.e., at least three out of five) on the items representing the validity checks. In contrast, participants recruited through St. Clair College and communities in Ontario were entered into a draw for 1 in 10 or 10% chance of winning a $50 gift card for Tim Hortons or Amazon, provided that they completed the study. As such, participants’ e-mail addresses were collected for compensation purposes and kept
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separately from their survey responses. In total, eight winners of the draw were notified by email, and all of the gift cards were sent via email.

Regardless of how participants were recruited or compensated, all participants were presented with 1) the consent form (participants from the participant pool were presented with the consent form in Appendix F, participants from other sources were presented with the consent form in Appendix G); 2) a list of community and campus mental health resources (see Appendix H); 3) questionnaires including CTQ-SF (Bernstein & Fink, 1998; Bernstein et al., 2003), SCL-90-R (Derogatis, 1983), SWLS (Diener et al., 1985), SCT short-form (Hy & Loevinger, 1996; Loevinger, 1985), MSPSS (Zimet et al., 1988), and BFI (John et al., 1991; John & Srivastava, 1999) in random order to control for any order effects that might influence findings; 4) the narrative task of positive event (non-trauma) then child maltreatment (trauma) memories; 5) TMQ (Halligan et al., 2003) and PCL-5 (Weathers et al., 2013) in random order so that these questionnaires would be about the trauma event elicited in the narrative task section; and 6) the debriefing form (see Appendix I) and the mental health resources again. Presenting the questionnaires online has many benefits, such as lower cost, quicker response time, ease of data entry, and increased self-disclosure (Granello & Wheaton, 2004). The response rate might also be higher as participants were able to complete the study at a time and location convenient to them rather than to present themselves at a laboratory at a given time. In addition, research has indicated that both methods of measurement, online and pen-and-paper surveys, yield comparable results (Davidov & Depner, 2011).

The consent form provided information regarding the general procedure and length of the study, the risks and benefits of being involved, and the researcher’s contact information should participants have any questions or concerns regarding the study (see Appendix F and Appendix
Participants were advised that their identifying information would not be connected to their responses to encourage them to be as open and forthcoming about their experiences as possible. Although studies on the effects of trauma-focused research suggest that most individuals do not show negative long-term effects of participation (Legerski & Bunnell, 2010), for some participants the narrative prompts and questionnaires may result in unpleasant thoughts and feelings of distress. Therefore, the consent form included information about campus and community counselling services and encourage all participants to use these services should they want to talk to someone about any of the negative events or feelings they disclosed in the study. Participants were required to read the form and provide consent by indicating that they understand the information before proceeding to the next online questionnaire. Following the consent form, participants were presented with a separate comprehensive list of community and campus mental health resources. At the end of the study, participants were presented with the debriefing form, which included information about the purpose of the study, as well as the comprehensive list of community and campus mental health resources again. No participants contacted the researcher regarding any concerns.

The present study also included five validity check questions placed either at the beginning or the end of the questionnaires to preserve the format of the measures as much as possible. These questions are “Please select Sometimes True for this item”, “Please select Mildly Disagree for this item”, “Please select Agree Strongly for this item”, “Please select A Little Bit for this question”, and “I have never used a computer” (correct response is negative). According to Curran (2016), validity check questions are used to safeguard against careless, inattentive, or random responses as these can cause significant threat to the validity of the data. By adding these questions during data collection, the pattern of the responses on these items can be used to make
decisions regarding data quality. Curran (2016) suggested a conservative inaccuracy rate of 50 percent as an indication that the specific participants should be considered as careless or insufficient effort responders.
CHAPTER IV

Results

Preliminary Analyses

Testing of Statistical Assumptions

Prior to testing the research questions, the following assumptions were considered and satisfied: independence of observations, no systematic missing data, correctly specified models, and adequate sample size (based on power analysis) (Kline, 2016). In addition, the following assumptions were assessed for confirmatory factor analysis (CFA) and structural equation modelling (SEM) (Kline, 2016), using IMB Statistical Package for the Social Sciences (SPSS), version 22. First, there were no missing data on the questionnaires that participants completed. However, for the narrative task, six participants did not write about a trauma event, and 12 participants did not write about a positive event (five did not write anything, six narrated a trauma event, and one noted a hearsay event). These were removed case-wise from the analyses. Second, no univariate or multivariate outliers were observed. The standardized residuals on the dependent variable were less than the cut-off value of 2.5, and the Mahalanobis Distance values were less than the cut-off value of 37.70. Third, the assumption of multivariate normality was violated. The skewness and kurtosis values for all variables were less than 1 and 2, respectively. However, the histograms for the child maltreatment and narrative coherence (context, chronology, and theme) variables did not appear to have a normal curve. In addition, both the Shapiro Wilk’s and Kolmogorov-Smirnov tests were significant, suggesting that the data violated normality. Given the non-normality of the data, as well as that some of the indicator variables were ordinal values and mean- and variance-adjusted weighted least square (WLSMV) was used as an estimator. Fourth, the assumption of absence of multicollinearity was mostly satisfied, as
NARRATIVE COHERENCE OF MALTREATMENT MEMORIES

the correlations among the predictor variables did not exceed .70. The only exception is between the theme coherence of positive event and length of narratives, which correlated at .73. Finally, the assumption of linearity between dependent variables and covariates on each independent variable were not violated.

*Descriptive Statistics for the Study Variables*

Table 5 below presents the range of scores, means, and standard deviations for the relevant variables of this study. In addition, participants reported on whether they received treatment previously or currently (individual psychotherapy, couple or family therapy, group therapy, and medication) in the demographic questionnaire. Their responses revealed that more than half of the 204 participants in the current study have received treatment ($n = 120, 59\%$). When compared to those in the study without treatment, those who have received either medication or therapy demonstrated more contextual and thematic coherence in their maltreatment narratives, as well as lower psychological distress. The two groups did not differ in their chronological coherence and life satisfaction (see Table 6).

To further understand the experiences of abuse and neglect experienced by this sample, descriptive statistics based on participants’ responses on the CTQ-SF (Bernstein & Fink, 1998) were presented. Table 7 depicts the mean and standard deviation, as well as the prevalence for each of the maltreatment types by gender for this sample. The prevalence is calculated based on the number of participants who endorsed at least a low severity level of abuse/neglect. In particular, Bernstein and Fink (1998) provided a guideline that specified the range of scores that constituted the severity of abuse and neglect on each of the subscales – *none to minimal, low to moderate, moderate to severe, and severe to extreme*. The low severity level was recommended as the cut-off for capturing a high proportion of true maltreatment cases while misidentifying less
### Table 5

**Descriptive Statistics for the Main Study Variables**

<table>
<thead>
<tr>
<th>Study Measures and Variables</th>
<th>n</th>
<th>Possible Score Ranges</th>
<th>Observed Score Ranges</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CTQ-SF: Child Maltreatment Total</strong></td>
<td>204</td>
<td>25-125</td>
<td>27-114</td>
<td>60.96</td>
<td>17.42</td>
</tr>
<tr>
<td>Sexual Abuse</td>
<td></td>
<td>5-25</td>
<td>5-25</td>
<td>9.51</td>
<td>6.45</td>
</tr>
<tr>
<td>Physical Abuse</td>
<td></td>
<td>5-25</td>
<td>5-25</td>
<td>10.59</td>
<td>5.35</td>
</tr>
<tr>
<td>Emotional Abuse</td>
<td></td>
<td>5-25</td>
<td>5-25</td>
<td>16.07</td>
<td>5.23</td>
</tr>
<tr>
<td>Physical Neglect</td>
<td></td>
<td>5-25</td>
<td>5-23</td>
<td>9.95</td>
<td>3.92</td>
</tr>
<tr>
<td>Emotional Neglect</td>
<td></td>
<td>5-25</td>
<td>5-25</td>
<td>14.83</td>
<td>4.94</td>
</tr>
<tr>
<td><strong>NaCCS: Narrative Coherence (Maltreatment Event)</strong></td>
<td>198</td>
<td>0-9</td>
<td>0-9</td>
<td>5.48</td>
<td>2.37</td>
</tr>
<tr>
<td>Context</td>
<td></td>
<td>0-3</td>
<td>0-3</td>
<td>1.65</td>
<td>1.17</td>
</tr>
<tr>
<td>Chronology</td>
<td></td>
<td>0-3</td>
<td>0-3</td>
<td>1.99</td>
<td>1.08</td>
</tr>
<tr>
<td>Theme</td>
<td></td>
<td>0-3</td>
<td>0-3</td>
<td>1.84</td>
<td>.76</td>
</tr>
<tr>
<td><strong>NaCCS: Narrative Coherence (Positive Event)</strong></td>
<td>192</td>
<td>0-9</td>
<td>1-9</td>
<td>4.80</td>
<td>2.29</td>
</tr>
<tr>
<td>Context</td>
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<td>0-3</td>
<td>1.79</td>
<td>1.10</td>
</tr>
<tr>
<td>Chronology</td>
<td></td>
<td>0-3</td>
<td>0-3</td>
<td>1.26</td>
<td>1.09</td>
</tr>
<tr>
<td>Theme</td>
<td></td>
<td>0-3</td>
<td>1-3</td>
<td>1.74</td>
<td>.76</td>
</tr>
<tr>
<td><strong>TMQ: Trauma Memory Characteristics</strong></td>
<td>204</td>
<td>0-52</td>
<td>0-45</td>
<td>19.63</td>
<td>10.47</td>
</tr>
<tr>
<td>Memory Disorganization</td>
<td></td>
<td>0-20</td>
<td>0-20</td>
<td>5.93</td>
<td>5.91</td>
</tr>
<tr>
<td>Memory Intrusion</td>
<td></td>
<td>0-32</td>
<td>0-32</td>
<td>13.70</td>
<td>7.64</td>
</tr>
<tr>
<td><strong>SCT: Ego Development</strong></td>
<td>202</td>
<td>1-9</td>
<td>2-8</td>
<td>5.21</td>
<td>1.12</td>
</tr>
<tr>
<td><strong>PCL-5: Posttraumatic Stress Symptoms</strong></td>
<td>204</td>
<td>0-80</td>
<td>0-70</td>
<td>28.84</td>
<td>18.85</td>
</tr>
<tr>
<td>Avoidance of Trauma Stimuli</td>
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<td>0-8</td>
<td>0-8</td>
<td>3.54</td>
<td>2.66</td>
</tr>
<tr>
<td>Intrusion and Dissociation</td>
<td></td>
<td>0-20</td>
<td>0-20</td>
<td>5.94</td>
<td>5.09</td>
</tr>
<tr>
<td>Negative Alternations in Cognitions and Mood</td>
<td></td>
<td>0-28</td>
<td>0-27</td>
<td>10.79</td>
<td>7.62</td>
</tr>
<tr>
<td>Marked Alternations in Arousal and Reactivity</td>
<td></td>
<td>0-24</td>
<td>0-22</td>
<td>8.56</td>
<td>6.22</td>
</tr>
<tr>
<td><strong>SCL-90-R: Psychological Distress</strong></td>
<td>204</td>
<td>0-4</td>
<td>0-3.11</td>
<td>1.24</td>
<td>.73</td>
</tr>
<tr>
<td>Somatization</td>
<td></td>
<td>0-48</td>
<td>0-46</td>
<td>12.80</td>
<td>10.60</td>
</tr>
<tr>
<td>Obsessive-Compulsive</td>
<td></td>
<td>0-40</td>
<td>0-35</td>
<td>16.19</td>
<td>9.11</td>
</tr>
<tr>
<td>Interpersonal Sensitivity</td>
<td></td>
<td>0-36</td>
<td>0-33</td>
<td>12.96</td>
<td>8.13</td>
</tr>
<tr>
<td>Depression</td>
<td></td>
<td>0-52</td>
<td>0-47</td>
<td>21.62</td>
<td>12.59</td>
</tr>
<tr>
<td>Anxiety</td>
<td></td>
<td>0-40</td>
<td>0-33</td>
<td>11.78</td>
<td>8.77</td>
</tr>
<tr>
<td>Hostility</td>
<td></td>
<td>0-24</td>
<td>0-24</td>
<td>5.64</td>
<td>4.76</td>
</tr>
<tr>
<td>Agoraphobic Anxiety</td>
<td></td>
<td>0-28</td>
<td>0-27</td>
<td>4.91</td>
<td>5.51</td>
</tr>
<tr>
<td>Paranoid Ideation</td>
<td></td>
<td>0-24</td>
<td>0-18</td>
<td>6.58</td>
<td>5.00</td>
</tr>
<tr>
<td>Psychoticism</td>
<td></td>
<td>0-40</td>
<td>0-33</td>
<td>8.73</td>
<td>7.35</td>
</tr>
<tr>
<td>Total (sum of all nine scales)</td>
<td></td>
<td>0-332</td>
<td>0-260</td>
<td>101.21</td>
<td>60.98</td>
</tr>
<tr>
<td><strong>SWLS: Life Satisfaction</strong></td>
<td>204</td>
<td>5-35</td>
<td>5-35</td>
<td>19.34</td>
<td>7.29</td>
</tr>
</tbody>
</table>

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Table 6

Comparing Participants With and Without Treatment: Maltreatment Narrative Coherence and Outcome Variables

<table>
<thead>
<tr>
<th></th>
<th>Treatment</th>
<th>No Treatment</th>
<th>t (df)</th>
<th>95% CI of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context Coherence</td>
<td>1.82 1.15</td>
<td>1.39 1.14</td>
<td>2.61*</td>
<td>[.11, .76]</td>
</tr>
<tr>
<td>Chronology Coherence</td>
<td>2.08 1.02</td>
<td>1.86 1.16</td>
<td>1.37</td>
<td>[-.09, .52]</td>
</tr>
<tr>
<td>Theme Coherence</td>
<td>1.97 .75</td>
<td>1.66 .73</td>
<td>2.83**</td>
<td>[.09, .52]</td>
</tr>
<tr>
<td>Psychological Distress</td>
<td>1.35 .74</td>
<td>1.07 .68</td>
<td>2.69**</td>
<td>[.07, .48]</td>
</tr>
<tr>
<td>Life Satisfaction</td>
<td>18.79 7.29</td>
<td>20.13 7.25</td>
<td>-1.29</td>
<td>[-3.38, .70]</td>
</tr>
</tbody>
</table>

Note. CI = Confidence Interval. *p < .05. **p < .01.
NARRATIVE COHERENCE OF MALTREATMENT MEMORIES

**Table 7**

*Means, Standard Deviations, and Prevalence of Child Maltreatment by Gender*

<table>
<thead>
<tr>
<th></th>
<th>Women (n = 159)</th>
<th>Men (n = 40)</th>
<th>Total (n = 204)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range</td>
<td>M (SD)</td>
<td>P</td>
</tr>
<tr>
<td>Sexual Abuse</td>
<td>5-25</td>
<td>9.98 (6.66)</td>
<td>47.8</td>
</tr>
<tr>
<td>Physical Abuse</td>
<td>5-25</td>
<td>10.60 (5.40)</td>
<td>62.3</td>
</tr>
<tr>
<td>Emotional Abuse</td>
<td>5-25</td>
<td>16.60 (5.13)</td>
<td>93.1</td>
</tr>
<tr>
<td>Physical Neglect</td>
<td>5-23</td>
<td>10.13 (4.07)</td>
<td>67.9</td>
</tr>
<tr>
<td>Emotional Neglect</td>
<td>5-25</td>
<td>15.22 (4.96)</td>
<td>86.2</td>
</tr>
<tr>
<td>Total</td>
<td>27-114</td>
<td>62.52 (18.10)</td>
<td>96.9</td>
</tr>
</tbody>
</table>

*Note. P = percentage above the cut-off score for None-to-Minimal cases recommended by Bernstein and Fink (1998).*
than 20% of non-maltreatment cases (Bernstein & Fink, 1998). The maltreatment scores endorsed by the participants in this study are higher than those reported by Paivio and Cramer (2004), but their sample was comprised of university students only.

Table 8 presents the severity classification for each of the maltreatment types (sexual abuse, physical abuse, emotional abuse, physical neglect, emotional neglect), and Table 9 presents the primary types of maltreatment for this sample. For the primary type of maltreatment, participants were coded as having experienced the type of abuse and/or neglect if they endorsed at least a low to moderate score on severity classification. The primary type of maltreatment experienced is based on the categorization method in Manly, Cicchetti, and Barnett (1994), specifically: 1) presence of sexual abuse with or without other types of maltreatment, 2) presence of physical abuse without sexual abuse and with or without emotional abuse and neglect, and 3) presence of emotional abuse or neglect without sexual and physical abuse. Similarly, for the number of types of maltreatment events experienced, participants were coded as having experienced the type of maltreatment if they endorsed at least a “low to moderate” score on the severity classification. The number of types of maltreatment experienced (sexual abuse, physical abuse, emotional abuse, physical neglect, emotional neglect) were then summed (see Table 9).

In addition, to compliment Research Question 1, descriptive information about the elicited narratives was represented to describe the nature of the child maltreatment and positive events. Specifically, of the child maltreatment narratives, 33 (16.7%) were about sexual abuse only, 43 (21.7%) were about physical abuse only, 60 (30.3%) were about emotional abuse only, 14 (7.1%) were about neglect only, 5 (2.5%) were about having witnessed domestic violence, 39 (19.7%) were about more than one type of maltreatment event, and 4 (2%) did not report a specific maltreatment event. Age of onset ranged from birth to 18 years, with 8 narratives
## NARRATIVE COHERENCE OF MALTREATMENT MEMORIES

### Table 8

*Frequency and Percentage of Maltreatment Severity Classification by Gender*

<table>
<thead>
<tr>
<th></th>
<th>None to Minimal</th>
<th>Low to Moderate</th>
<th>Moderate to Severe</th>
<th>Severe to Extreme</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n$ (%)</td>
<td>$n$ (%)</td>
<td>$n$ (%)</td>
<td>$n$ (%)</td>
</tr>
<tr>
<td><strong>Women</strong> ($n = 159$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexual Abuse</td>
<td>83 (52.2)</td>
<td>9 (5.7)</td>
<td>19 (11.9)</td>
<td>48 (30.2)</td>
</tr>
<tr>
<td>Physical Abuse</td>
<td>60 (37.7)</td>
<td>27 (17.0)</td>
<td>26 (16.4)</td>
<td>35 (17.2)</td>
</tr>
<tr>
<td>Emotional Abuse</td>
<td>11 (6.9)</td>
<td>10 (25.0)</td>
<td>29 (18.2)</td>
<td>92 (57.9)</td>
</tr>
<tr>
<td>Physical Neglect</td>
<td>51 (32.1)</td>
<td>31 (19.5)</td>
<td>39 (24.5)</td>
<td>38 (23.9)</td>
</tr>
<tr>
<td>Emotional Neglect</td>
<td>22 (13.8)</td>
<td>45 (28.3)</td>
<td>39 (24.5)</td>
<td>53 (33.3)</td>
</tr>
<tr>
<td><strong>Men</strong> ($n = 40$)</td>
<td>28 (70.0)</td>
<td>4 (10.0)</td>
<td>8 (20.0)</td>
<td>7 (17.5)</td>
</tr>
<tr>
<td><strong>Total</strong> ($n = 204$)</td>
<td>114 (55.9)</td>
<td>12 (5.9)</td>
<td>21 (10.3)</td>
<td>57 (27.9)</td>
</tr>
</tbody>
</table>

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### Table 9

*Frequency and Percentage of Primary Type and Number of Types of Maltreatment Experienced by Gender*

<table>
<thead>
<tr>
<th>Maltreatment Type</th>
<th>Women (n = 159)</th>
<th>Men (n = 40)</th>
<th>Total (n = 204)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Primarily Sexual Abuse</td>
<td>76 (47.8)</td>
<td>12 (30.0)</td>
<td>90 (44.1)</td>
</tr>
<tr>
<td>Primarily Physical Abuse</td>
<td>44 (27.7)</td>
<td>18 (45.0)</td>
<td>63 (30.9)</td>
</tr>
<tr>
<td>Primarily Emotional Abuse/Neglect</td>
<td>34 (21.4)</td>
<td>9 (22.5)</td>
<td>43 (21.1)</td>
</tr>
<tr>
<td>One Type of Maltreatment</td>
<td>6 (3.8)</td>
<td>3 (7.5)</td>
<td>9 (4.4)</td>
</tr>
<tr>
<td>Two Types of Maltreatment</td>
<td>22 (13.8)</td>
<td>7 (17.5)</td>
<td>29 (14.2)</td>
</tr>
<tr>
<td>Three Types of Maltreatment</td>
<td>30 (18.9)</td>
<td>10 (25.0)</td>
<td>43 (21.1)</td>
</tr>
<tr>
<td>Four Types of Maltreatment</td>
<td>52 (32.7)</td>
<td>13 (32.5)</td>
<td>67 (32.8)</td>
</tr>
<tr>
<td>Five Types of Maltreatment</td>
<td>44 (27.7)</td>
<td>6 (15.0)</td>
<td>50 (24.5)</td>
</tr>
</tbody>
</table>
NARRATIVE COHERENCE OF MALTREATMENT MEMORIES

indicating that the events occurred during toddlerhood or younger, 60 narratives indicating that the events occurred during school-age, 26 narratives indicating that the events occurred during adolescence, and 1 narrative indicating that the event spanned over toddlerhood and school-age. About 103 respondents did not report the age of onset for events. The perpetrator of abuse included immediate family \((n = 148, 74.7\%)\), extended family \((n = 16, 8.1\%)\), romantic partners \((n = 1, 0.5\%)\), friends \((n = 3, 1.5\%)\), acquaintances \((n = 21, 10.6\%)\), and strangers \((n = 1, 0.5\%)\). Eight (4%) of the respondents did not identify a perpetrator.

Of the positive event narratives, 100 (52.1%) were about a relationship, 50 (26.0%) were about achievement, 39 (20.3%) were about leisure, 1 (0.5%) was about mortality, and 2 (1.0%) were about a different type of event. These event categories were taken from Thorne and colleagues’ (2004) article. Age of onset ranged from birth to 18 years, with 6 narratives indicating that the events occurred during toddlerhood or younger, 59 narratives indicating that the events occurred during school-age, 39 narratives indicating that the events occurred during adolescence, and 2 narratives indicating that the events spanned over school-age and adolescence. Eighty-eight of the respondents did not indicate the age of onset in their narratives. The people involved in the narratives included themselves primarily \((n = 41, 21.4\%)\), immediate family \((n = 65, 33.9\%)\), extended family \((n = 25, 13.0\%)\), romantic partners \((n = 3, 1.6\%)\), friends \((n = 19, 9.9\%)\), acquaintances \((n = 21, 10.9\%)\), strangers \((n = 1, 0.5\%)\), and more than one category of people \((n = 17, 8.9\%)\). Furthermore, Table 10 presents the descriptive statistics for the coherence (context, chronology, theme), length, and reading level of the narratives for each of the event types.
### Table 10

*Descriptive Statistics for Coherence, Length, and Reading Level of Narratives*

<table>
<thead>
<tr>
<th></th>
<th>Maltreatment Event (n = 198)</th>
<th>Positive Event (n = 192)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>M (SD)</td>
</tr>
<tr>
<td><strong>Narrative Coherence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Context</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>38 (19.2%)</td>
<td>1.65 (1.17)</td>
</tr>
<tr>
<td>1</td>
<td>67 (33.8%)</td>
<td>1.79 (1.10)</td>
</tr>
<tr>
<td>2</td>
<td>20 (10.1%)</td>
<td>1.99 (1.08)</td>
</tr>
<tr>
<td>3</td>
<td>73 (36.9%)</td>
<td>1.99 (1.08)</td>
</tr>
<tr>
<td>Chronology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>23 (11.6%)</td>
<td>1.99 (1.08)</td>
</tr>
<tr>
<td>1</td>
<td>47 (23.7%)</td>
<td>1.99 (1.08)</td>
</tr>
<tr>
<td>2</td>
<td>37 (18.7%)</td>
<td>1.99 (1.08)</td>
</tr>
<tr>
<td>3</td>
<td>91 (46.0%)</td>
<td>1.99 (1.08)</td>
</tr>
<tr>
<td>Theme</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1 (0.5%)</td>
<td>1.84 (.76)</td>
</tr>
<tr>
<td>1</td>
<td>71 (35.9%)</td>
<td>1.84 (.76)</td>
</tr>
<tr>
<td>2</td>
<td>84 (42.4%)</td>
<td>1.84 (.76)</td>
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<tr>
<td>3</td>
<td>42 (21.2%)</td>
<td>1.84 (.76)</td>
</tr>
<tr>
<td>Length of Narrative</td>
<td>166.60 (182.20)</td>
<td>112.37 (86.02)</td>
</tr>
<tr>
<td>Reading Level of Narrative</td>
<td>8.47 (3.40)</td>
<td>8.39 (3.17)</td>
</tr>
</tbody>
</table>
Correlations for the Study Variables

For the main study variables for Research Questions 2 and 3, a correlation matrix was computed to ascertain how these independent, moderator, mediator, and dependent variables are related to each other in the present study (see Table 1 below). For coherence indicators of the maltreatment event, only physical abuse and emotional abuse were positively correlated with chronology coherence. For moderator variables (i.e., ego development, posttraumatic stress symptoms), physical abuse, emotional abuse, and physical neglect were positively correlated with avoidance symptoms; emotional abuse, physical neglect, and emotional neglect were positively correlated with intrusion and dissociation symptoms; and all abuse and neglect types were positively correlated with negative alteration in mood and cognitions. Finally, for outcome variables, sexual abuse, emotional abuse, and physical neglect were positively correlated with psychological distress; and emotional abuse and emotional neglect were negatively correlated with life satisfaction. All of these variables were kept in the data analyses.

In addition, for each of the narrative types (maltreatment event and positive event), a correlation table was computed to examine the correlations between each of the narrative coherence indicators (i.e., context, chronology, theme, and memory disorganization) and the potential covariates noted in the literature review section above (i.e., retention interval, rehearsal effect, personality traits, social supports, self-reported grade point average, length of narratives as measured by word count, and reading level of narratives) (see Table 2). Only length of narratives was positively correlated with the global coding of the coherence indicators (context, chronology, theme) for both narrative types. For the maltreatment event, retention interval was positively correlated with context and chronology coherence. Furthermore, memory disorganization correlated with the personality traits of conscientiousness negatively and
Table 11

Correlation Matrix for the Main Study Variables

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<td>-.34**</td>
<td>-.49**</td>
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Note. * p < .05 (2-tailed), ** p < .01 (2-tailed).
NARRATIVE COHERENCE OF MALTREATMENT MEMORIES

Table 12

*Correlation Table for Narrative Coherence Indicators and Potential Covariates*

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<td>.11</td>
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<tr>
<td>Personality: Openness</td>
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<td>.04</td>
<td>.07</td>
<td>-.08</td>
<td>.12</td>
<td>-.12</td>
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</table>

*Note.* *p < .05 (2-tailed). ** p < .01 (2-tailed).
neuroticism positively. All other covariates were not significant. Only length of narratives and retention interval were included in the analyses as covariates. To preserve degrees of freedom for the analyses, conscientiousness and neuroticism were not included in the data analyses.

**Measurement Models for Latent Constructs**

For Research Questions 2 and 3, confirmatory factor analyses were computed using the Lavaan package in R Studio 1.2.5033 (https://www.rstudio.com/products/rstudio/download/) to examine how the latent variables of child maltreatment, narrative coherence, and posttraumatic stress symptoms held together as constructs. CFA is a type of multivariate technique used to assess how well the measured variables hold together and are representative of the nature of the specific latent construct (Kline, 2016). To assess the extent to which the proposed models are consistent with the data collected, a number of model fit indices were used. These include Minimal Fit Function chi-square and associated degrees of freedom, Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation and its 90% confidence interval (RMSEA), and Standardized Root Mean Square Residual (SRMR) (Bentler & Bonett, 1980; Hu & Benter, 1999; Jöreskog & Sörbom, 1996). The normed chi-square, or chi-square to degrees of freedom ratio ($\chi^2/df$) is considered to be a better indicator of fit than the chi-square value given that the chi-square value is highly sensitive to sample size; in addition, recommendations for $\chi^2/df$ ratio are inconsistent, but generally have ranged from a maximum value of 2 to 5 to indicate good fit (Bentler & Bonett, 1980; Hooper et al., 2008). For CFI and TLI, a traditional guideline is that values of .90 or greater represent acceptable fit; however, Hu and Bentler (1999) argued that the cut-off value should be .95 for both fit indices. In addition, a cut-off value of .06 for RMSEA and .08 for SRMR indicate acceptable fit. For RMSEA, values
First, child maltreatment was modelled as a latent variable comprising of sexual abuse, physical abuse, emotional abuse, physical neglect, and emotional neglect composite scores. The factor loading of the first indicator of all latent variables was fixed to 1. CFA for the measurement model revealed a significant $\chi^2$ value ($14.88, p = .01$), as well as both acceptable ($\chi^2/df = 2.98, CFI = .94, SRMR = .05$) and mediocre (TLI = .88, RMSEA = .10) fit indices. Whereas physical abuse (.51), emotional abuse (.81), physical neglect (.62), and emotional neglect (.79) all loaded significantly onto the latent construct, sexual abuse did not (.17, $p = .053$). As such, two predictor variables emerged from the data: 1) sexual abuse and 2) physical and emotional maltreatment latent variable comprised of physical abuse, emotional abuse, physical neglect, and emotional neglect.

For the second predictor variable, another CFA was computed to examine if the indicators held together as one latent construct. Similar to above, results revealed a significant $\chi^2$ value ($9.43, p = .01$), as well as both acceptable ($\chi^2/df = 4.72, CFI = .96, SRMR = .05$) and poorer (TLI = .87, RMSEA = .14) fit indices. The indicators all loaded well onto the physical and emotional maltreatment latent variable, with standardized coefficients ranging from .50-.81.

Second, coherence of child maltreatment narratives was modelled as a latent variable comprising of the NaCCS subscales of context, chronology, and theme, as well as self-report of memory disorganization. CFA for the measurement model revealed excellent fit indices ($\chi^2 = .59 (p = .74), \chi^2/df = .30, CFI = 1.00, TLI = 1.03, RMSEA = .00, SRMR = .01$); however, this is likely the result of a saturated model with few parameters remaining. Nonetheless, results revealed that context (.76), chronology (.61), and theme (.82) loaded significantly onto the
narrative coherence latent variable, but memory disorganization did not (-.08, \( p = .36 \)). The finding that the narrative coding and subjective rating of coherence did not converge into one latent variable is consistent with previous findings that revealed that subjective rating and narrative coding of coherence are not highly correlated (e.g., Greenhoot et al., 2013; Rubin et al., 2016). Given this finding, global coding of context, chronology, and theme coherence were kept within the narrative coherence latent variable, and memory disorganization was modelled as a separate variable to reflect self-report coherence of the trauma memory.

Finally, posttraumatic stress symptoms were modelled as a latent variable comprised of symptoms of avoidance, intrusion and dissociation, and negative alteration in cognitions and mood. Given that there were only three indicators (with zero degrees of freedom remaining), this represents a just-identified model, which yields perfect fit indices. As such, an additional constraint was added by fixing the second indicator variable to its estimated factor loading (in addition to the first indicator being fixed to 1). Results revealed excellent fit indices (\( \chi^2 = .00 \ (p = .996) \), \( \chi^2/df = 0 \), CFI = 1.00, TLI = 1.01, RMSEA = .00, SRMR = .00), again suggesting an almost saturated model. Individual loadings indicated that all three symptoms loaded significantly onto the construct, specifically avoidance (.82), intrusion and dissociations (.84), and negative alterations in cognitions and mood (.76). As such, this latent variable was included as proposed.

Results of the confirmatory factor analyses for the latent constructs of child maltreatment, coherence of maltreatment narratives, and posttraumatic stress symptoms contributed to how the variables were modelled in the present study. Specifically, two variables were included as predictor variables for the models in Research Questions 2 and 3: 1) sexual abuse and 2) physical and emotional maltreatment. Coherence of maltreatment narratives was also modelled as two
variables: 1) narrative coherence comprised of context, chronology, and theme and 2) memory disorganization. Coherence of maltreatment narratives was the outcome variable for the model in Research Question 2 and a mediator variable for the model in Research Question 3. Finally, given that the indicators for posttraumatic stress symptoms (avoidance, intrusion and dissociation, and negative alterations in cognitions and mood) all loaded well onto the construct, these were included as proposed. Posttraumatic stress disorder was the moderator variable in the model in Research Question 2.

**Research Question 1: Maltreatment versus Positive Event Narratives**

Research Question 1 examines if child maltreatment narratives were less coherent than the non-trauma, positive event narratives. For this question, a repeated measure CFA was computed, as suggested by statistical consultant, Dr. Dennis Jackson (personal communication, September 20, 2019), using the Lavaan package in R Studio 1.2.5033. The two latent variables were coherence of maltreatment narratives and coherence of positive event narratives. Both latent variables were comprised of three indicators each: context, chronology, and theme coherence. The self-report of memory disorganization was not included as an indicator of narrative coherence in this research question, as the responses on this measure was collected for the trauma event only, and therefore, comparison on this measure was not possible. In order to compare the means of the two latent variables, they had to first establish invariance, demonstrating that the two latent constructs are equivalent. For this, the loadings and intercepts (mean) for each of the indicators were set to be equal between the two latent variables, and the correlations between error terms for each of the indicators were allowed to be correlated. Results revealed poor fit indices ($\chi^2 = 74.46 (p = .00)$, $\chi^2/df = 7.45$, CFI = .79, TLI = .68, RMSEA = .19, SRMR = .10), suggesting that the coherence of the maltreatment narratives was different from
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that of the positive event narratives. Given that the two latent constructs were not demonstrated to be equivalent, the coherence indicators were individually examined to see if they differed between the maltreatment and positive event narratives.

Tables 5 and 10 (pages 72 and 79, respectively) above outlined the mean and standard deviation for each of the coherence indicators (context, chronology, and theme) for the participants in the present study. The t-tests conducted revealed that chronology and theme coherence were significantly different between the narrative types, but not context coherence. For chronology coherence, which assesses if the sequence of actions within the narrated events follows a temporal order, maltreatment narratives were more coherent \( (M = 2.00, SD = 1.07) \) than positive event narratives \( (M = 1.27, SD = 1.08), t(189) = 6.90, p = .000 \). For theme coherence, which reflects elaboration and meaning making about the events, maltreatment narratives were also more coherent \( (M = 1.87, SD = .74) \) than positive event narratives \( (M = 1.75, SD = .76), t(189) = 2.25, p = .026 \). In contrast, context coherence (information on time and place of events) between the two narrative types was not significantly different from each other.

Results revealed that maltreatment narratives were overall more coherent than positive event narratives, which is contrary to the hypothesis.

Additional Analysis: Comparing Narrative Coherence of Participants with High Posttraumatic Stress Symptoms

An additional analysis was computed to compare the coherence of trauma and positive event narratives in participants who endorsed higher levels of posttraumatic stress symptoms, those who were presumably most impacted by their trauma experiences. In particular, participants with a total posttraumatic stress symptom score of 33 or higher were selected for analysis \( (n = 76) \); this score was the cut-off recommended for further assessment to confirm a
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diagnosis of posttraumatic stress disorder (Weathers et al., 2013). In order to compare the means of the two latent variables, similar constraints were set as the main analysis. Results revealed an acceptable $\chi^2/df$ value (4.30), but overall poor fit indices ($\chi^2 = 42.95$ ($p = .00$), CFI = .56, TLI = .33, RMSEA = .21, SRMR = .13), suggesting that the coherence of the maltreatment narratives and positive event narratives were also not equivalent in this sub-sample. In addition, when the coherence indicators were examined separately, only chronology coherence was significantly different between the two types of narratives. Specifically, the chronology dimension of maltreatment narratives was more coherent ($M = 2.01$, $SD = 1.03$) than that of positive event narratives ($M = 1.17$, $SD = 1.06$), $t(75) = 5.12$, $p = .000$.

Research Question 2: Ego Development and Posttraumatic Stress Symptoms as Moderators

Research Question 2 examines if ego development and posttraumatic stress symptoms (i.e., avoidance of trauma stimuli, intrusion and dissociation symptoms, and negative alterations in cognitions and mood) moderate the relation between child maltreatment and coherence of child maltreatment narratives. For this question, two separate moderations using SEM were conducted using the Lavaan package in R Studio 1.2.5033. SEM is a family of techniques where researchers model the covariance relations among different observed and unobserved variables (Kline, 2016). This analysis was computed to test the structural relations among the observed and latent independent (known as exogenous in CFA and SEM), moderator, mediator, and dependent (known as endogenous in CFA and SEM) variables. As noted above, the exogenous variables were 1) sexual abuse and 2) physical and emotional maltreatment latent variable comprised of physical abuse, emotional abuse, physical neglect, and emotional neglect. The two moderator variables were 1) observed variable of ego development and 2) latent variable comprised of
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posttraumatic stress symptoms (i.e., avoidance of trauma stimuli, intrusion and dissociation symptoms, and negative alterations in cognitions and mood), which were used in separate moderation analyses. For each of the two moderations, interaction terms were created (Kline, 2016), using the Lavaan package. For the moderator of ego development, the cross-products between the exogenous variables of sexual abuse and physical and emotional maltreatment and ego development were computed. For the moderator of posttraumatic stress symptoms, the cross products between sexual abuse and physical and emotional maltreatment and the latent variable of posttraumatic stress symptoms were computed. These interaction terms were included in the analysis to test for moderations between the exogenous and moderator variables. Finally, the endogenous variables were 1) narrative coherence latent variable comprised of context, chronology, and theme coherence and 2) memory disorganization. Although memory disorganization was originally conceptualized as an indicator of narrative coherence, results of the CFA showed that it was distinct from global coding of coherence.

Hypothesis 2a: Ego Development as Moderator

As indicated in Table 13, Model 1 below, the proposed model has a non-significant \( \chi^2 \) value (51.35, \( p = .02 \)) and acceptable fit indices, specifically \( \chi^2/df \) (1.56), CFI (.92), TLI (.94), RMSEA (.05), and SRMR (.06). Figure 5 displays the standardized regression coefficients for this model. In the figure, significant relations are represented by solid lines, and non-significant relations are represented by dotted lines. Ego development predicted narrative coherence (\( \beta = .18, p = .04 \)), indicating that those with higher levels of ego development were better able to produce a coherent written account of their maltreatment experiences. In contrast, ego development level did not predict participant’s memory disorganization. In addition, sexual abuse and physical and emotional maltreatment did not predict either narrative coherence or
Table 13

*Model Fit Indices for Research Question 2*

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<th>p-value</th>
<th>$\chi^2$/df</th>
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<th>TLI</th>
<th>RMSEA</th>
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*Note.* CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.
NARRATIVE COHERENCE OF MALTREATMENT MEMORIES

Figure 5

*SEM Model for Research Question 2a*

Note. *p < .05. **p < .01.*
memory disorganization, suggesting that the severity of the maltreatment did not affect how coherently participants narrated such experiences or how coherent their memory of the event is. The moderation terms between sexual abuse and physical and emotional maltreatment and ego development also did not predict narrative coherence or memory disorganization.

When the covariates of retention interval and length of narratives were added to narrative coherence, poorer fit indices were observed (e.g., CFI = .83, TLI = .90) (see Table 13, Model 2). However, chi-square difference test, which compared the chi-square values for Model 1 and 2, indicated that the models were not significantly different from each other (p = .09). In this model, the covariate of length of narratives was the only predictor of narrative coherence (β = .95, p = .00), and in contrast to Model 1, ego development became non-significant in this model. This suggests that the effect of ego development on narrative coherence was accounted for by the length of the narratives. In general, while ego development was a predictor of narrative coherence in the first model, it was not a significant moderator of narrative coherence or memory disorganization, and results did not support the first hypothesis of this research question.

**Hypothesis 2b: Posttraumatic Stress Symptoms as Moderator**

As indicated in Table 13, Model 3, the proposed model has a non-significant χ² value (71.68, p = .03) and acceptable fit indices, including χ²/df (1.41), CFI (.93), TLI (.93), RMSEA (.05), and SRMR (.05). Figure 6 displays the standardized regression coefficients for this model. In the figure, solid and dotted lines are used to represent significant and non-significant relations, respectively. Posttraumatic stress symptoms predicted memory disorganization (β = .31, p = .00), suggesting that those who endorsed higher clinical symptoms were more likely to have less coherent memory of the trauma event. In contrast, posttraumatic stress symptoms did not predict narrative coherence. Similarly, sexual abuse and physical and emotional maltreatment did not
Figure 6

SEM Model for Research Question 2b

Note. *p < .05. **p < .01.
predict narrative coherence or memory disorganization. In addition, the moderation terms between sexual abuse and physical and emotional maltreatment and posttraumatic stress symptoms also did not predict narrative coherence or memory disorganization.

When the covariates of retention interval and length of narratives were added to narrative coherence, lower fit indices were observed (e.g., CFI = .90, TLI = .92, SRMR = .06) (see Table 13, Model 4). However, chi-square difference test revealed that these models were not significantly different from each other ($p = .11$). Posttraumatic stress symptoms remained a significant predictor of memory disorganization ($\beta = .31, p = .00$), and similar to hypothesis 2a, the covariate of length of narratives was a predictor of narrative coherence ($\beta = .94, p = .00$). As such, results did not support the second hypothesis of this research question; posttraumatic stress symptoms did not moderate the relation between child maltreatment and narrative coherence or memory disorganization.

**Additional Analyses on Narrative Coherence**

The findings that child maltreatment and posttraumatic stress symptoms did not predict narrative coherence are in contrast to hypotheses, and these relations were further explored by examining the different composition of the variables (indicators and total scores). First, multiple linear regression analyses were conducted to examine if child maltreatment types (sexual abuse, physical abuse, emotional abuse, physical neglect, emotional neglect) and posttraumatic stress symptoms (avoidance, intrusion and dissociation, negative alterations in mood and cognitions) predicted each of the narrative coherence indicators (context, chronology, theme) and total narrative coherence (sum of context, chronology, and theme) (see Table 14). Second, the direction of posttraumatic stress symptoms and narrative coherence was reversed, and multiple linear regression analyses were conducted to examine if narrative coherence indicators predicted...
### Table 14

**Additional Analyses: Child Maltreatment and Posttraumatic Stress Symptoms Predicting Narrative Coherence**

<table>
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<tr>
<th>Coherence Indicator</th>
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<th>$F$</th>
<th>$B$</th>
<th>$SE$</th>
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<th>95% CI for $B$</th>
<th>$sr$</th>
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</table>

*Note.* Adj. = Adjusted; CI = Confidence Interval.
each of the posttraumatic stress symptoms (see Table 15). Finally, narrative coherence was grouped into High Coherence (scores of 2-3 for the context, chronology, and theme indicators, 6-9 for total coherence) versus Low Coherence (scores of 0-1 for the indicators and 0-5 for total coherence), and t-tests were conducted to examine if the groups differed on posttraumatic stress symptoms (see Table 16). Given the numerous tests, a $p$-value of less than .01 was used as a criterion for significance. Results revealed that these analyses were not significant.

**Research Question 3: Narrative Coherence and Memory Disorganization as Mediators**

Research Question 3 examines if coherence of child maltreatment narratives mediates the relations between child maltreatment and psychological distress and life satisfaction. For this question, mediations using SEM were calculated using the Lavaan package in R Studio 1.2.5033. Similar to Research Question 2, the exogenous variables were 1) sexual abuse and 2) physical and emotional maltreatment, a latent variable comprised of physical abuse, emotional abuse, physical neglect, and emotional neglect. The mediator variables were 1) narrative coherence latent variable comprised of context, chronology, and theme and 2) memory disorganization. As indicated above, memory disorganization was originally conceptualized as an indicator of narrative coherence. However, results of the CFA showed that it was distinct from global coding of coherence, and as such, these were modelled as separate variables in the data analyses. Finally, the endogenous variables were psychological distress and life satisfaction, which were correlated. To test for mediation, the indirect effects were calculated between the exogenous and endogenous variables using the Lavaan package to determine if these were significant pathways.

As indicated in Table 17, Model 1 below, the proposed model for this research question has a non-significant $\chi^2$ value ($57.00, p = .01$) and acceptable fit indices, specifically $\chi^2/df$ (1.63), CFI (.92), TLI (.90), RMSEA (.06), and SRMR (.05). Figure 7 displays the standardized
### Table 15

**Additional Analyses: Narrative Coherence Indicators Predicting Posttraumatic Stress Symptoms**

<table>
<thead>
<tr>
<th>Posttraumatic Stress Symptoms</th>
<th>Adj. $R^2$</th>
<th>$R^2$</th>
<th>$F$</th>
<th>$B$</th>
<th>$SE$</th>
<th>$\beta$</th>
<th>95% CI for $B$</th>
<th>$sr$</th>
<th>$sr^2$</th>
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<tr>
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Note. Adj. = Adjusted; CI = Confidence Interval.
Table 16

Additional Analyses: Comparing Low and High Coherence Groups on Posttraumatic Stress Symptoms

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<tr>
<th>Posttraumatic Stress Symptoms</th>
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<th>95% CI</th>
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<td>n</td>
<td>M (SD)</td>
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Note. CI = Confidence Interval.
### Table 17

*Model Fit Indices for Research Question 3*

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<th>$p$-value</th>
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<th>TLI</th>
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*Note.* CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.
NARRATIVE COHERENCE OF MALTREATMENT MEMORIES

Figure 7

SEM Model for Research Question 3

Note. *p < .05. **p < .01.
regression coefficients for this model. In the figure, significant relations are represented by solid lines, and non-significant relations are represented by dotted lines. The variables of sexual abuse ($\beta = .21, p = .00$) and physical and emotional maltreatment ($\beta = .20, p = .01$), as well as narrative coherence ($\beta = .18, p = .03$) and memory disorganization ($\beta = .19, p = .00$) predicted psychological distress, indicating that the more severe the child maltreatment experience and the less coherent the maltreatment narratives and memory, the greater the psychological distress. Only physical and emotional maltreatment predicted life satisfaction ($\beta = -.28, p = .00$), whereas sexual abuse, narrative coherence, and memory disorganization did not, suggesting that the greater the physical and emotional abuse and neglect, the lower the life satisfaction. However, history of sexual abuse and level of narrative coherence and disorganization of maltreatment memories were unrelated to how satisfied participants were with their life. In addition, similar to Research Question 2, sexual abuse and physical and emotional maltreatment did not predict narrative coherence or memory disorganization, suggesting that the severity of maltreatment experiences did not affect how coherently participants were able to produce a written account of or remember these experiences. Moreover, the indirect effects of narrative coherence and memory disorganization were not significant in the relations between child maltreatment (sexual abuse, physical and emotional maltreatment) and outcome variables (psychological distress, life satisfaction). This indicates that narrative coherence and memory disorganization were not significant mediators in these relations.

When the covariates of retention interval and length of narratives were added to narrative coherence, poorer fit indices were observed (e.g., CFI = .87, TLI = .89, SRMR = .06) (see Table 17, Model 2). The chi-square difference test, which was conducted to compare the chi-square values of Model 1 and 2 (i.e., with and without covariates), revealed that the two models were
not significantly different from each other ($p = .07$). In this model, length of narratives was a significant covariate for narrative coherence ($\beta = .94, p = .00$), and in contrast to Model 1, narrative coherence became a non-significant predictor of psychological distress in this model. This suggests that the effect of narrative coherence on psychological distress was partially accounted for by the length of the narratives. Although the first model had good fit indices, it did not support the hypotheses as the mediation effects were not significant; narrative coherence and memory disorganization did not mediate the relations between child maltreatment and outcome variables of psychological distress and life satisfaction.

**Additional Analyses on Psychological Distress**

Given that psychological distress was a significant dependent variable to the predictor and mediator variables in the model for research question 3, it was further explored by examining the nine symptom dimensions from the measure (SCL-90-R; Derogatis, 1983). These psychological symptom dimensions were somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, agoraphobic anxiety, paranoid ideation, and psychoticism. Specifically, multiple linear regression analyses were conducted to examine if child maltreatment types (sexual abuse, physical abuse, emotional abuse, physical neglect, and emotional neglect), narrative coherence indicators (context, chronology, and theme), and memory disorganization predicted each of the psychological symptom dimensions. Given the high number of regression analyses (9), a $p$-value of less than .01 was used as a criterion for significance. As shown in Table 18, all of the regression models were significant ($p < .01$), with child maltreatment, narrative coherence, and memory disorganization together accounting for between 7 to 16% of the variance in the psychological symptom dimensions. See Table 19 for a summary of the present study findings.
Table 18

Additional Analyses: Child Maltreatment, Narrative Coherence, and Memory Disorganization Predicting SCL-90-R Symptom Dimensions

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### NARRATIVE COHERENCE OF MALTREATMENT MEMORIES

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*Note. Adj. = Adjusted; CI = Confidence Interval. *$p < .05$. **$p < .01$.*
# Table 19

**Summary of Results**

<table>
<thead>
<tr>
<th>Research Questions and Hypotheses</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1  Are child maltreatment narratives less coherent than non-trauma narratives?</td>
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</tr>
<tr>
<td>1a) Child maltreatment narratives will be less coherent (measured by global coding of context, chronology, and theme coherence) than non-trauma narratives.</td>
<td>- This hypothesis was not supported. In fact, child maltreatment narratives had higher chronological and thematic coherence ratings than non-trauma, positive event narratives.</td>
</tr>
<tr>
<td>Additional analyses: Are child maltreatment narratives less coherent than non-trauma narratives among participants who endorsed high levels of posttraumatic stress symptoms?</td>
<td>- Not supported; child maltreatment narratives were more chronologically coherent than non-trauma, positive event narratives.</td>
</tr>
<tr>
<td>#2  Do variables such as ego development and posttraumatic stress symptoms (i.e., avoidance of trauma stimuli, intrusion and dissociation symptoms, and negative alterations in cognitions and mood) moderate the relation between child maltreatment and coherence of child maltreatment narratives?</td>
<td></td>
</tr>
</tbody>
</table>
| 2a) Ego development will moderate the relation between child maltreatment and coherence of maltreatment narratives (measured by global coding of context, chronology, and theme coherence and subjective rating of memory disorganization). | - The hypothesis on the moderation was not supported; however, the overall model has acceptable fit.  
- Within the model and consistent with the literature, ego development predicted greater narrative coherence. |
| 2b) Posttraumatic stress symptoms will moderate the relation between child maltreatment and coherence of maltreatment narratives (measured by global coding of context, chronology, and theme coherence and subjective rating of memory disorganization). | - The hypothesis on the moderation was not supported; however, the overall model has acceptable fit.  
- Within the model and consistent with the literature, posttraumatic stress symptoms predicted greater memory disorganization. |
Additional analyses: Do specific child maltreatment types (sexual abuse, physical abuse, emotional abuse, physical neglect, emotional neglect) and posttraumatic stress symptoms (avoidance, intrusion and dissociation, negative alterations in mood and cognitions) predict narrative coherence indicators?

• Not supported; child maltreatment types and specific posttraumatic stress symptoms did not predict narrative coherence indicators (context, chronology, theme).

Additional analyses: Do narrative coherence indicators (context, chronology, theme) contribute to specific posttraumatic stress symptoms (avoidance, intrusion and dissociation, negative alterations in mood and cognitions)?

• Not supported; narrative coherence indicators did not predict posttraumatic stress symptoms, and there were no group differences for the coherence level (high versus low) on posttraumatic stress symptoms.

#3 Does coherence of child maltreatment narratives mediate the relations between child maltreatment and the outcomes of psychological distress and life satisfaction?

3a) Narrative coherence (measured by global coding of context, chronology, and theme coherence and subjective rating of memory disorganization) will mediate the relations between child maltreatment and outcome variables of psychological distress and life satisfaction.

• The hypothesis on the mediation was not supported; however, the overall model has acceptable fit.

• Within the model and consistent with the literature, i) all types of child maltreatment predicted greater psychological distress; ii) physical and emotional maltreatment predicted lower life satisfaction; and iii) lower narrative coherence and memory disorganization predicted greater psychological distress.

Additional analyses: Do child maltreatment types, narrative coherence indicators, and memory disorganization predict each of the psychological symptom dimensions?

• Supported; child maltreatment, narrative coherence, and memory disorganization accounted for 7-16% of the variance in the psychological symptom dimensions.
CHAPTER V

Discussion

The present study aimed to examine the relations between child maltreatment, narrative coherence, and psychological outcomes. In particular, in the present study, I investigated whether 1) child maltreatment narratives were less coherent than non-trauma, positive event narratives; 2) factors such as ego development and posttraumatic stress symptoms moderated the relations between child maltreatment and narrative coherence and disorganization of maltreatment memories; and 3) narrative coherence and memory disorganization mediated the relations between child maltreatment and psychological distress and life satisfaction. As indicated above, child maltreatment is associated with a range of psychological problems across the lifespan and has negative intergenerational consequences (e.g., Herrenkohl et al., 2012; Jaffee, 2017; Maschi et al., 2012). Given the scope of the problem, it is crucial for researchers to understand the mechanisms through which child maltreatment leads to poor psychological outcomes.

Results of the present study revealed that the hypotheses associated with the original research questions that were posed were not supported. Nonetheless, several of the study findings are noteworthy and consistent with some of the literature. First, child maltreatment narratives were actually more coherent than the non-trauma, positive event narratives in this study, indicating that some individuals are more likely to make meaning and establish coherence of their negative event as compared to the positive event they described (e.g., Baker-Ward et al., 2005; Cox & McAdams, 2019). Second, among the study participants, experiences of child maltreatment can be grouped into child sexual abuse and other types of maltreatment (physical and emotional abuse and neglect), suggesting that child sexual abuse is unique from the other maltreatment types (e.g., Lewis et al., 2016; Noll, 2008). Third, self-reported memory
disorganization was distinct from global coding of narrative coherence comprised of context, chronology, and theme. This may reflect the difference in how trauma experiences feel to people (which contributes to how they self-report on these experiences) versus how they reflect on and narrate these events (e.g., Greenhout et al., 2013; Rubin et al., 2016). Fourth, ego development was an important factor in predicting narrative coherence, and this is likely in part attributable to cognitive capacity and flexibility (e.g., Adler et al., 2007). Fifth, those who reported posttraumatic stress symptoms were also more likely to report disorganization when recounting their trauma memory (e.g., Brewin, 2007, 2016; Jelinek et al., 2009). Finally, although child maltreatment was not associated with narrative coherence and memory disorganization, all three factors contributed to psychological distress (e.g., Miragoli et al., 2017; Pals, 2006; Vanderveren et al., 2017). Each of these findings and the study hypotheses are further described below.

It is important to note that when length of narratives was added to the models, 1) ego development no longer predicted narrative coherence; and 2) narrative coherence no longer predicted psychological distress. Length of narratives correlated with ego development and the coherence of both child maltreatment and positive event narratives, especially theme coherence (see Table 12 on page 82). It also predicted narrative coherence in the models. Length of narrative may be a proxy for verbal or linguistic skills, which has been argued to be important in constructing a structured story (McLean et al., 2017). It is also possible that people tend to use more words to convey a coherent account of their experiences, or that those who remember their experiences may have more to say about their experiences, resulting in both higher length and coherence level. There are mixed findings on the effect of length of narratives on narrative coherence (e.g., Chen et al., 2012; Freer et al., 2010; Reese et al., 2011). Given the strong association between the two variables in the present study, length of narratives may be a
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redundant variable to narrative coherence. Given that the inclusion of length of narrative as a covariate affects the results and the present study’s emphasis on narrative coherence, the discussion below focused on the findings on narrative coherence, without the covariate of length of narratives.

**Research Question 1: Maltreatment versus Positive Event Narratives**

Child maltreatment narratives were significantly more chronologically and thematically coherent than non-trauma, positive-event narratives, not less coherent as hypothesized based on some past literature (Miragoli et al., 2017; Mossige et al., 2005). In addition, the narratives did not differ in their inclusion of contextual information. This suggests that participants remembered the time and place of the event types equally well, but they included information in a more chronological order and provided more elaboration and meaning making in their maltreatment narratives than their positive event narratives. This finding is in contrast to the literature reviewed above on child maltreatment narratives. It is also not consistent with either sides of the argument on the coherence of trauma narratives, namely, whether trauma narratives are less coherent (e.g., Brewin, 2014; Ehlers & Clark, 2000) or no different than non-trauma narratives (e.g., Rubin, 2011; Rubin et al., 2016). Nonetheless, there are multiple potential explanations for this finding that are in line with the literature and may help to clarify why this hypothesis was not supported.

In general, narratives of trauma events are supposed to be less coherent because the trauma events are typically so disruptive that people are unable to integrate these experiences into their existing beliefs (Pals, 2006). If trauma events elicited in the present study are not disruptive enough that it impairs people’s ability to make sense of and integrate them into their existing life narrative, then the narratives would not be less coherent. Unfortunately, the present
study did not ask participants to self-report on the level of impairment their trauma caused them; however, participants completed a measure on posttraumatic stress symptoms consistent with the DSM-5 (PCL-5; Weathers et al., 2013) following the narrative task, and this can be used as a proxy to provide some information about the trauma event. Results revealed that the mean score of total posttraumatic stress symptom was less than the cut-off recommended for further assessment for posttraumatic stress disorder, and less than half of participants met the cut-off score. Furthermore, even for the participants who have experienced extremely high levels of stress during trauma exposure, it is possible that they avoided moments of peak emotional distress during their narration of the maltreatment experiences, which according to Brewin (2016) is critical in producing an incoherent account of trauma narratives.

For the studies that found that narratives of child sexual abuse are not coherent or are less coherent than non-trauma narratives, the samples were comprised of children and adolescents who were either in a court proceeding for child sexual abuse (Miragoli et al., 2017) or in treatment for child sexual abuse (Capella, 2017; Mossige et al., 2005). Therefore, the intensity and impact of the trauma event were likely high at the time of their participation, which was likely to disrupt the participants’ ability to integrate these events into their existing beliefs and to produce a coherent account of their trauma exposure. It is also possible that the age of participants and the time of assessment (childhood instead of adulthood) may have contributed to the lower coherence of trauma narratives found in these studies. However, similar results were found in several studies that examined trauma events in adulthood, particularly that narratives of trauma events were less coherent among the clinical samples (e.g., Halligan et al., 2003; Römisch et al., 2014). There is some evidence that the intensity of the trauma events experienced affects people’s ability to process and make meaning of the events (Bohanek et al., 2004; Waters
et al., 2013). For example, Waters and colleagues (2013) asked 108 undergraduate students to narrate highly positive and highly negative events, which were then coded for context, chronology, and theme coherence. Waters and colleagues found that the narratives of the positive and negative events were similar in their coherence level when intensity and retention interval of the events were controlled, suggesting that in part, the intensity of the events affected how coherently people narrated these events.

It is also possible that participants experienced emotional distress during their narration of the trauma event, but this was not captured by the coding rubric used in the present study. As indicated in the literature review, some have argued that narratives that are analyzed at the utterance level show less coherence than narratives that are analyzed at the global level (Brewin, 2007, 2016; Jelinek et al., 2009). This is because when narratives are examined clause-by-clause, memory fragmentation and disorganized thoughts related to the event become more evident (Brewin, 2007, 2016; Jelinek et al., 2009). The present study used the Narrative Coherence Coding Scheme (Reese et al., 2011), which coded the narratives globally rather than at the utterance level, and thus, may have captured general, well-rehearsed narratives instead of incoherent narratives characterized by fragmentation and disorganized thoughts.

On the other hand, whereas extremely high levels of stress during trauma exposure may disrupt people’s ability to make sense of their experience, there is evidence that the experience of some stress during negative events may actually enhance how coherently one narrates such events (e.g., Fivush et al., 2008). It has been proposed that stressful or negative events create a problem to be solved, which in turn lead to more effort to construct coherent narratives about these events in order to make sense of them (Cox & McAdams, 2019; Fivush et al., 2008; Vanderveren et al., 2017). In contrast, neutral or positive experiences do not engender efforts at
meaning making, as these narratives naturally fit into people’s existing beliefs (Cox & McAdams, 2019). In line with this, studies have found that narratives of negative or low point events have more meaning and are more coherent than narratives of neutral or positive events (e.g., Baker-Ward et al., 2005; Cox & McAdams, 2019; Fivush et al., 2008; Fivush et al., 2002; Peterson & Biggs, 2001). For example, Fivush and colleagues (2008) examined 89 children (8-12 years old) with asthma and their mothers and asked them to narrate a scary, frustrating, and happy event in relation to having asthma. The narratives were then coded for coherence (context, chronology, and theme; Baker-Ward et al., 2007) and mental state language (number of words used to refer to cognitive, negative emotions, and positive emotions). Fivush and colleagues found that for both children and their mothers, the narratives of negative events (scared and frustrated) were more coherent than the narratives of happy events. In addition, Cox and McAdams (2019) asked 145 young adults and 154 late midlife adults to write about key scenes in their life story, including two high points and two low points. These narratives were then coded for vividness, positive and negative meaning, and coherence, as well as coded using a computer program developed by Pennebaker and colleagues, Linguistic Inquiry Word Count (LIWC; Pennebaker et al., 2007), to code for word count, affect, present tense verbs, and cognitive mechanisms. Cox and McAdams found that the high point and low point events were not significantly different in vividness and coherence, but there was greater meaning making in the narratives of low point events than those of high point events. In addition, results of the automatic linguistic analysis (LIWC) showed that low point narratives displayed greater word counts and usage of cognitive mechanism words, suggesting greater cognitive processing in low point narratives at word level. By creating coherent narratives about past experiences,
particular of negative or stressful experiences, people can create meaning, which helps them to integrate these into their existing life story (Vanderveren et al., 2017).

It is also possible that people are motivated to process or explain away the negative or trauma events because these are typically inconsistent with and threaten their narrative identity (Cox & McAdams, 2019; Foley, 2018). Specifically, these experiences violate people’s assumptions about themselves and the world. In order to protect themselves, people are motivated to incorporate these events into their life story in a coherent way that mitigates or rationalizes the negative content of these events (Cox & McAdams, 2019). Foley (2018) argued that the process of recollecting people’s memory reflects constructing or piecing together different aspects of the event, rather than locating the event from memory, which is influenced by people’s knowledge, beliefs, assumptions, and reasoning about what must have happened. Thus, in the process of reconstructing the memory, people may be motivated to establish and sustain a coherent life story (Foley, 2018).

This may be especially so for the participants of the present study, which was comprised of college and university students, a sample that is different from the general population in that they are likely to be more intelligent, to have better coping strategies, and to be more resilient (Erdogan et al., 2015; Sattler, 2008). This sample is also likely subjected to selection bias in that their childhood traumas have not derailed their ability to attain higher education. In particular, these individuals were asked to narrate a maltreatment event before the age of 15 (although some participants narrated events that occurred between ages 15-18). Thus, it is possible that participants have already processed and made sense of these events before participating in this study, and so they were able to narrate these experiences coherently. It is also possible that participants self-selected into this study because they are comfortable with the topic, as they
were presented with multiple cautionary notes before participating (Legerski & Bunnell, 2010). In fact, more than half of participants in the present study indicated that they have received treatment previously or currently (individual psychotherapy, couple or family therapy, group therapy, and medication) Therefore, it is possible that the maltreatment events narrated by the participants in the present study were either less disruptive or participants were better able to make sense of and cope with these events than the participants in other studies.

**Research Question 2: Ego Development and Posttraumatic Stress Symptoms as Moderators**

Ego development and posttraumatic stress symptoms (avoidance of trauma stimuli, intrusion and dissociation symptoms, and negative alterations in cognitions and mood) did not moderate the relation between child maltreatment (sexual abuse, physical and emotional maltreatment) and narrative coherence (context, chronology, and theme) and disorganization of child maltreatment memories, as hypothesized. In fact, child maltreatment severity did not predict narrative coherence and disorganization of maltreatment memories at all; this is further described below before discussing the specific moderators. When examining the narrative coherence indicators, results revealed that these were somewhat coherent; this is in contrast to the literature reviewed above that indicated that narratives of child sexual abuse are generally less coherent overall (e.g., Capella, 2017; Mossige et al., 2005).

As explained earlier, there are many reasons as to why narratives of trauma events are not less coherent, at least in the present study. Although participants’ self report of their memory disorganization did not correlate with the global coding of their narrative coherence, which is consistent with the literature and may reflect the differences in how trauma memories feel to people versus how people recollect the events (Greenhoot et al., 2013), the same explanations are
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relevant for memory disorganization. Even as the severity of child maltreatment increases, it is possible that the maltreatment experience for the participants was not as disruptive or did not reach the threshold of disruptiveness that typically is needed to render a trauma narrative less coherent or a trauma memory more disorganized.

In addition, participants in the present study may have been motivated to make sense of these experiences, irrespective of the extent of their maltreatment experiences, resulting in a non-significant relation between child maltreatment severity and narrative coherence and disorganization of maltreatment memories. This appears to be true for all types of child maltreatment examined (sexual abuse, physical abuse, emotional abuse, physical neglect, emotional neglect), all of which did not have significant correlations or notable patterns with each of the indicators of narrative coherence and memory disorganization. The exception is with physical and emotional abuse, which had a positive correlation with chronology coherence.

An interesting finding of the present study is participants’ experiences of the different types of maltreatment. Physical abuse, emotional abuse, physical neglect, and emotional neglect all loaded well onto the child maltreatment latent variable, but sexual abuse did not, suggesting that participants’ experiences of sexual abuse are inherently different than their experiences of physical or emotional maltreatment. There is evidence that experiences of sexual abuse constitute a unique experience that is different from other maltreatment types. Specifically, feelings of shame, guilt, betrayal, powerlessness, and stigmatization, as well as boundary violations combined may impact victims of child sexual abuse more profoundly or in different ways than those of other maltreatment experiences (Feiring & Taska, 2005; Lewis et al., 2016; Noll, 2008). Feelings of shame in particular may result from the secretive context in which sexual abuse takes place, condemnation of the victim by the perpetrator, and explicit threats to
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keep silent (Feiring & Taska, 2005; Lewis et al., 2016). In addition, victims of child sexual abuse are often at a higher risk of experiencing other types of maltreatment (Lewis et al., 2016). Even when the experience of multiple maltreatment types was controlled, Lewis and colleagues (2016) found that those with a history of sexual abuse had significantly greater internalizing and externalizing problems over time compared to those without a history of sexual abuse. As such, experiences of child sexual abuse may present differently for the participants of the present study than the other types of maltreatment.

Research Question 2a: Ego Development as Moderator

Results revealed that ego development predicted narrative coherence. However, the moderating role of ego development was not significant and did not change the relation between child maltreatment and narrative coherence and memory disorganization. This could be partly due to the fact that the predictor variable, child maltreatment severity, was not associated with the outcome variables, narrative coherence and memory disorganization. There was no significant correlation between child maltreatment severity and ego development as well, so it was unlikely that ego development would have served as a moderating variable in this relation. Furthermore, it is conceivable that having higher ego development generally improves people’s ability to narrate trauma events coherently, as described below, regardless of the severity of the child maltreatment experiences; and as such, it does not serve as a moderator in this relation.

In the present study, ego development predicted narrative coherence of maltreatment memories, suggesting that those with higher levels of ego development were better able to narrate their maltreatment experiences coherently. There was little variation in ego development levels among the participants in the present study, as most (83%) were within the mid to high range levels (levels 5-7). This suggests that for many participants, the framework that they used
to understand the world was more differentiated, socialized, and nuanced. This is not surprising given that the present study is comprised of a university/college sample. Nonetheless, it is possible that the predictive value of ego development would be higher with a more diverse sample of participants. As described above, ego development, assessed via a sentence completion test, reflects the framework that people use to make sense of the world (Adler et al., 2007; Hy & Loevinger, 1996). Whereas those at the lower levels of ego development interpret experiences in a highly egocentric and simplistic ways, those at the higher levels show greater tolerance for cognitive complexity and advanced perspective taking (Adler et al., 2007). The literature argued that those with higher ego development levels tend to construct their lives as complex stories of personal transformation and growth (Adler et al., 2007; Bauer & McAdams, 2004). As such, these individuals may have more practice at making sense of disparate or conflicting components of their experiences and integrating them into a coherent narrative (Adler et al., 2007). Accordingly, our findings are consistent in that those with higher levels of ego development constructed a more coherent account of their trauma experiences than those with lower levels of ego development. In fact, these individuals may be particularly driven to make sense of and explain away the negative events in their life in order to integrate them into their narrative identity.

Research Question 2b: Posttraumatic Stress Symptoms as Moderator

Posttraumatic stress symptom predicted memory disorganization; however, posttraumatic stress symptoms neither predicted narrative coherence nor moderated the relation between child maltreatment and narrative coherence and memory disorganization. The specific symptoms (avoidance of trauma stimuli, intrusion and dissociation symptoms, and negative alterations in cognitions and mood) also did not individually predict narrative coherence, as indicated by a lack
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of significant correlations or notable patterns between each of the posttraumatic stress symptoms and the indicators of narrative coherence (context, chronology, context). These findings suggest that the severity of maltreatment and posttraumatic stress symptoms do not affect how coherently participants narrate their maltreatment experiences. Similar to the finding on ego development, this may be partly due to the fact that both child maltreatment severity and posttraumatic stress symptoms were not associated with narrative coherence of maltreatment memories.

The finding that posttraumatic stress symptoms predicted memory disorganization is consistent with the literature and suggests that those with higher posttraumatic stress symptoms reported their trauma memory to be more disorganized. As discussed in the literature review section, some have suggested that incoherence is a feature of posttraumatic stress disorder and narratives of trauma memories are less coherent than narratives of non-trauma memories specifically within the posttraumatic stress disorder population (e.g., Brewin, 2007, 2016; Jelinek et al., 2009; Jones et al., 2007). In addition, symptoms of avoidance, intrusion and dissociation, and negative alterations in cognitions and mood have been argued to negatively affect people’s ability to remember the trauma events (e.g., Halligan et al., 2003; Hayes et al., 2017; Valentino et al., 2009). As such, these memories are likely to feel disorganized to the participants. The fact that posttraumatic stress symptoms predicted memory disorganization may also reflect the nature of the questions on the study measures. In particular, questions related to memory disorganization resembled a question under the symptom category of negative alterations in cognitions and mood (“trouble remembering important parts of the stressful experience”), so it is not surprising that participants responded similarly on these questions. In addition, whereas narrative coherence is based on analyzing the written account of the trauma events, both posttraumatic stress symptoms and memory disorganization are based on participants’ self
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reports. Therefore, it is possible that participants who reported higher posttraumatic stress symptoms related to trauma memories are also more likely to report having more disorganized trauma memories.

The finding that posttraumatic stress symptoms did not predict narrative coherence is in contrast to existing literature. As indicated, trauma symptoms have been argued to interfere with people’s ability to remember the trauma events, and thus, produce a coherent account of the trauma events (Halligan et al., 2003; Valentino et al., 2009). Nonetheless, there are possible explanations for these findings of the present study. First, there may be a high threshold of clinical symptoms that participants have to endorse to negatively impact their cognitive processes and render their trauma narratives incoherent. In this study, participants were not assessed for whether they met the diagnostic criteria for posttraumatic stress disorder. Second, it is possible that the narrated trauma experiences did not include intensely emotional moments, as reflected in the experiences of flashbacks, dissociations, hot spots, or memory gaps (Brewin, 2016). One of the symptoms of posttraumatic stress disorder is avoidance of trauma reminders, so as to avoid reliving the experiences (Foa et al., 1995); however, avoidance of the emotional aspects of the trauma experiences may not be implicated in how coherently participants are able to produce a written account of their trauma experiences. In particular, participants can still narrate a coherent story comprised of some information in relation to time and place of the event, temporal sequence of actions in relation to the event, and elaboration and meaning making of the event, while leaving out certain emotional aspects of the narratives. Third, although participants were prompted to base their responses on the trauma symptom questionnaire on the narrated maltreatment event, it is possible that the posttraumatic stress symptoms endorsed might not actually be related to the narrated event. If this is true, then the coherence level of the
maltreatment narratives is likely not associated with the posttraumatic stress symptoms that they endorsed. As such, even those with high levels of posttraumatic stress symptoms are likely adept at producing a coherent account of the elicited trauma event. Finally, it is possible that participants’ level of fatigue and motivation affected their responses on the trauma symptom questionnaire, as this was one the last two questionnaires administered. Specifically, all participants completed eight questionnaires, one sentence completion task, and a narrative task comprised of two stories, with over 240 questions in total.

**Research Question 3: Narrative Coherence and Memory Disorganization as Mediators**

Narrative coherence of maltreatment memories (context, chronology, and theme) and memory disorganization did not mediate the relations between child maltreatment severity (sexual abuse, physical and emotional maltreatment) and psychological distress and life satisfaction, contrary to the hypotheses. This may be in part because child maltreatment severity is not associated with narrative coherence or disorganization of maltreatment memories. The results are in contrast to some of the literature reviewed, and possible reasons for this were already discussed above. Nonetheless, other findings within the model (see Figure 7 on page 100) are significant and consistent with the literature, as described below.

As expected, child maltreatment severity predicted psychological distress and life satisfaction, suggesting that the more severe the child maltreatment, the higher the psychological distress and the lower the life satisfaction participants experienced. This finding adds to the robust literature on the negative effects of child maltreatment and serves as additional support for the critical importance of prevention and intervention services for children and adults with a history of child abuse and neglect.
Another significant finding of the present study is that narrative coherence and disorganization of maltreatment memories predicted psychological distress (but not life satisfaction). The fact that the ability to coherently remember and narrate one’s trauma experiences is associated with lowered psychological distress is consistent with the literature (e.g., Baerger & McAdams, 1999; Graci & Fivush, 2017; Pals, 2006; Vanderveren et al., 2017; Waters & Fivush, 2015). It is possible that those who have trouble organizing their trauma memories and producing a coherent account of the trauma events are more likely to feel distressed due to not feeling resolved or having closure about the unfortunate events. The present study was unable to assess the causal relation between narrative coherence and memory disorganization and psychological distress; however, existing research on trauma treatment and expressive writing suggested that changes in trauma narratives precede changes in psychological well-being (e.g., Adler, 2012; Cohen et al., 2006; Foa et al., 1995; Vrana et al., 2019). Although child maltreatment is not associated with low narrative coherence or disorganization of the maltreatment memories, both are important factors in participants’ experiences of psychological distress. It is possible that through the processing of the trauma narrative, the experience becomes integrated into people’s life stories, rather than remaining a topic that needs to be avoided (Cohen et al., 2006). This finding further adds support to the value of narrative processing and highlights the important role of the ability to coherently narrate trauma experiences in this sample.

**Implications for Research and Clinical Practice**

The present study has several implications. First, results filled a gap in the literature by providing information on the coherence of child maltreatment narratives and comparing them to coherence of non-trauma narratives. The past literature on the coherence of trauma narratives did
NARRATIVE COHERENCE OF MALTREATMENT MEMORIES

not typically differentiate between trauma in childhood and adulthood, and when childhood trauma was examined, researchers focused on child sexual abuse specifically. Although child maltreatment narratives were found to be more coherent than non-trauma, positive event narratives in the present study, contrary to the hypothesis, several explanations were offered to account for such findings and suggested directions for future research. In addition, results of the present study provided information on how different types of maltreatment experiences (e.g., sexual abuse, physical abuse, emotional abuse, physical neglect, emotional neglect) contributed to the overall child maltreatment experiences. Importantly, results revealed that experiences of child sexual abuse are distinctly unique from other types of abuse or neglect, and reasons for this are outlined above.

Results of the present study also added to the existing literature on the harmful effects of child maltreatment on psychological functioning; and this served as additional support for prevention and intervention programs for child maltreatment. Additionally, results revealed that narrative coherence is associated with lower psychological distress, as well as that having received psychological treatment (therapy or medication) is associated with higher coherence ratings and lower psychological distress, as compared to not having received treatment, suggesting the importance for narrative processing in trauma treatment.

Strengths and Limitations

The present study has several strengths. First, the present study assessed narrative coherence from different perspectives, including both global coding of the narrative content and self report of memory disorganization. This in part helped to explain the inconsistent findings on narrative coherence of trauma memories in the literature. Second, the coding of narrative coherence was found to have good inter-rater reliability, which increased the confidence about
the validity of the narrative coding rubric. Third, the present study examined covariates that
could potentially influence the results. Fourth, participants completed the narrative task online in
a setting of their choice, which likely served to promote greater self disclosure (Granello &
Wheaton, 2004). Finally, the present study included a sample size that is larger than the studies
cited above, resulting in more trauma narratives and allowing for greater power to detect a
difference, should it exist.

There are a number of limitations for the present study, and all results must be considered
within the context of these limitations. First, the present study used a cross-sectional study design
to assess the relation between child maltreatment severity, narrative coherence, memory
disorganization, and outcome variables of psychological distress and life satisfaction. Using a
cross-sectional design precluded the interpretation of a causal relation between these variables,
which limited the conclusions that can be drawn from the present study (Kazdin, 2003). Second,
participants completed the narrative tasks online (rather than using an interview format), which
did not allow for following up on their answers or putting in place a structure that would
otherwise result in more uniformed responses (e.g., in terms of narrative length and study
duration) (Peace & Porter, 2004). Third, although the present study assessed narrative coherence
using both self-report measure and narrative-based global coding, it did not capture other ways
of assessing the construct. For example, using a more refined coding scheme for narrative
coherence (utterance-by-utterance analysis) may have resulted in the detection of more
incoherence of trauma narratives (e.g., Jelinek et al., 2009). Fourth, the present study relied on
participants to self-report retrospectively their history of child maltreatment, and these are
subject to potential biases or errors involving recall (e.g., Briere & Conte, 1993). In addition, it is
impossible to know if participants’ maltreatment status was confirmed or documented, and as
such, the range of experiences of child maltreatment may differ significantly. Fifth, while participants completed a questionnaire on posttraumatic stress symptoms, they were not assessed to see if they met the diagnostic criteria for posttraumatic stress disorder. This additional piece of information may affect the conclusions drawn from this study, given the inconsistent findings on the coherence level of trauma narratives in the clinical sample (e.g., Brewin, 2007; Rubin et al., 2016). Lastly, results of the present study are of limited generalizability due to the characteristics of the participants (i.e., university students, predominately female, and predominately Caucasian).

**Future Directions**

Results of the present study suggest several directions for future research. First, the present study revealed that length of narratives is strongly associated with narrative coherence and even masked the effect of narrative coherence in the study models. The relation between length of narrative and narrative coherence should be further explored, as well as the role of verbal skills in narrative coherence. It is possible that length of narrative reflects verbal skills, which may be an indicator for narrative coherence (McLean et al., 2017). Specifically, people may use more words to convey a coherent account of their negative experiences, or that those who have processed their experiences may have more to say, resulting in both higher word count and coherence level. On the other hand, it is also possible that, in the clinical sample, longer narratives reflect confusion and disorganized thoughts about the event, rather than a more coherent account of the negative experiences.

Second, future studies can examine the specified relations and models in a more ethnic and gender diverse sample to determine the generalizability of the current findings. The majority of the participants in the present study were female, and as such, there may be a gender effect in
the findings on narrative coherence. Specifically, females were found to have a slightly higher verbal ability than males (Sattler, 2008), and verbal ability was associated with narrative coherence (McLean et al., 2017). In fact, Adler and colleagues (2007) found that the female gender was correlated with narrative coherence.

Third, replicating the present study using a clinical sample is also particularly valuable, such as including only documented cases of child maltreatment and/or those with confirmed diagnosis of posttraumatic stress disorder. In addition, it would be important to assess the intensity and impact of the narrated trauma event, as this may be the underlying factor that affects the coherence level of trauma narratives (e.g., Waters et al., 2013), as highlighted above. When considering clinical samples, it is crucial from an ethical standpoint that steps are taken to protect participants who are likely more vulnerable (Legerski & Bunnell, 2010). These may include clearly explaining the risks associated with participating in the study (e.g., psychological concerns, impact on interpersonal relationships, particularly caregivers); establishing a protocol for suicide risk assessment; completing the study in person (such as using an interview format), so psychological concerns can be addressed in the moment; connecting with participants’ mental health clinicians before and after their participation (if recruitment occurred in a mental health organization); providing a list of mental health resources; and conducting follow-up phone calls. It is also valuable to include a follow-up study to examine the short-term and long-term impact of participating in trauma studies on participants’ psychological functioning and interpersonal relationships (Legerski & Bunnell, 2010).

Fourth, future studies can examine how other characteristics of maltreatment (e.g., age of onset, duration of maltreatment) may affect how coherently people narrate these unfortunate experiences and their psychological functioning. For example, it is possible that maltreatment
occurring at a younger age and across multiple developmental stages is associated with lower coherence level and poorer psychological functioning overall, given developing language and reasoning capacity that results in difficulty making sense of and coherently narrating these experiences (e.g., Salmon & Reese, 2015). Furthermore, in the present study consistent with other literature (e.g., Feiring & Taska, 2005; Lewis et al., 2016), experiences of child sexual abuse were found to be distinct from other types of abuse and neglect. Thus, it would be valuable to further examine the differences between these types or categories of maltreatment, particularly using a qualitative design.

Finally, in addition to ego development and posttraumatic stress symptoms, it would be worthwhile to explore other moderating variables in the context of child maltreatment and narrative coherence. It may be valuable to explore other qualities in trauma narratives, such as meaning making (Mclean & Pratt, 2006), self-event connection (Pasupathi & Weeks, 2010), redemption (McAdams et al., 2001), and emotional resolution (Pals, 2006) to understand how these themes affect child maltreatment, narrative coherence, and psychological functioning. It is important to note that, with coding of trauma narratives, proper steps should be put in place to protect the raters from being triggered by the narratives (e.g., an avenue to discuss their experience with coding). In addition to qualitative themes, attachment style and resilience may also affect how coherently people are able to narrate their maltreatment experiences. It is possible that those who are more resilient and with healthy, secure attachment to another individual (e.g., non-perpetuating parent, partner) are more likely to narrate their maltreatment events more coherently, possibly through having more secure sense of self, better coping, and/or having processed the event with their person of attachment (Capella, 2017; Masten & Monn, 2015; Waters & Fivush, 2015; Williams, 1994).
Furthermore, individuals are nested in families, which are nested in the societies in which they reside, and as such, it is important to explore systemic factors that may affect the findings of the study. For example, there may be an implicit expectation that people repress their traumatic experiences, and it has been a taboo for women to publicize experiences of sexual assault (Deblinger & Runyon, 2005; Williams, 1994). People may also feel pressured to “get over” or thrive from their trauma (McCoy & Dunlop, 2017). All of these factors, at the individual, familial, and societal levels, are important to consider.

Conclusions

The goals of the present study were to examine if a history of child maltreatment was associated with lower ability to narrate these experiences coherently, if factors such as ego development and posttraumatic stress symptoms contributed to such coherence, and if lower coherence in turn resulted in higher psychological distress beyond having a history of child maltreatment. Although the study hypotheses were not supported, some findings emerging from the data are important and worth highlighting. Specifically, results revealed that at least among the study sample (predominantly females, college/university education, many having received therapy), child maltreatment narratives were chronologically and thematically more coherent than the non-trauma, positive event narratives. In addition, ego development and length of narratives were important factors in narrative coherence. Furthermore, child maltreatment, narrative coherence of maltreatment memories, and memory disorganization all contributed to psychological distress, which is represented by symptoms consistent with somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, agoraphobic anxiety, paranoid ideation, and psychoticism. This is consistent with the literature and points to the importance of narrative coherence in psychological functioning among this sample.
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APPENDICES

Appendix A

Demographic Information Questionnaire

1. How old are you? ______
2. What gender do you identify with? ______________
3. Which of the following best describes your ethnicity?
   a. Arab/Middle Eastern
   b. Asian/Pacific Islander
   c. Black/African/Caribbean
   d. Caucasian/European
   e. Hispanic/Latino(a)
   f. Native/Aboriginal
   g. Other, specify __________
4. What is your family annual income?
   a. 70,000 or more
   b. 60,000 to 69,999
   c. 50,000 to 59,999
   d. 40,000 to 49,999
   e. 30,000 to 39,999
   f. Below 30,000
   g. I do not know or I do not wish to answer
5. What is the highest education level you obtained? _________________
6. What is your program of enrolment in college/university (if applicable)? __________
7. What is your current year of enrolment in college/university (if applicable)? __________
8. What is your grade point average (GPA) in college/university (if applicable)? _________
9. Have you previously or are you currently receiving psychological treatment? Yes _ No _
   If Yes, please check all that applies
   ___ Individual psychotherapy
   ___ Couples or Family therapy
   ___ Group therapy
   ___ Medication
10. What is your self-identified gender?
    a. Male
    b. Female
    c. Neither male or female. Please specify (write in) ______________
11. [This question will only appear for those who indicated Neither in question 9]
    One of the well-validated measures in this survey was developed for understanding how
    people approach situations. There are two similar versions of this measure, one developed
    for males and one developed for females. Which of the following versions of the measure
    would you like to complete?
    a. Male
    b. Female
    c. Neither
PARTICIPANT POOL ADVERTISEMENT

Title: Narrative Coherence of Child Maltreatment Memories in Adults

Researcher: Na Zhu, Email: zhu13f@uwindsor.ca

Duration: 60 minutes

Credit: 1

Description: The purpose of this study is to examine the narratives of child maltreatment memories in adults. Specifically, the study is designed to investigate how adults make meaning of these unfortunate experiences from their childhood and the possible factors that influence this process. For this study, you will be asked to complete questionnaires on your background information, experience and memory of child maltreatment, psychological functioning, personality, and social support. You will also be asked to give a detailed description and answer a few short answer questions pertaining to the difficult events and their impact. This study will take close to 60 minutes of your time and is worth 1 bonus point if you are registered in the pool and you are registered in one or more eligible courses.

Inclusion Criterion: In order to participate in the study, you will need to have experienced one or more incidents of abuse or neglect before 15 years old. You will be asked to write about these events, which may cause psychological discomfort. If this is a concern, please do not participate in this study. Please note that you will be instructed to refer to others you describe by their roles or relationship to you rather than by their names so that the information you share cannot be connected to your identity during data analysis.
Hello,

My name is Na Zhu, and I am a PhD student in the Clinical Psychology program at the University of Windsor. For my research, I am looking at how people tell their experiences of childhood maltreatment. I am hoping that my study will help us to better understand the importance of how people remember and narrate these events and explain why some people function better than others despite these experiences.

For my study, I am recruiting adults (18 years old or older) who have experienced one or more incidents of child abuse or neglect before 15 years old. You will be asked to complete questionnaires and short answer questions online, which will take about 60 minutes. For your time, you will be entered into a draw for 1 in 10 or 10% chance of winning a $50 gift card for Tim Hortons or Amazon.

If you have not already participated and are interested in participating, you can click on the following link: https://uwindsor.ca1.qualtrics.com/jfe/form/SV_3VtoOaL2k6RCikR. This study is cleared by the University of Windsor Research Ethics Boards. If you have any questions, please contact me at narrativestudy@uwindsor.ca. Thank you very much for your time.

Warm Regards,
Na

Na Zhu, MA
PhD Candidate, Clinical Psychology
University of Windsor
Hello,

My name is Na Zhu, and I am a PhD student in the Clinical Psychology program at the University of Windsor. For my research, I am looking at how people tell their experiences of childhood maltreatment. I am hoping that my study will help us to better understand the importance of how people remember and narrate these unfortunate experiences and explain why some people have better functioning than others despite these experiences.

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Please note that this study is not connected to any of your courses and that participation in this study will not be linked to your grades. This study is cleared by St. Clair College and University of Windsor Research Ethics Boards. If you are interested in participating, you can click on the following link: https://uwindsor.ca1.qualtrics.com/jfe/form/SV_3VtoOaL2k6RCikR. If you have any questions, please contact me at narrativestudy@uwindsor.ca. Thank you very much for your time.

Warm Regards,
Na

Na Zhu, MA
PhD Candidate, Clinical Psychology
University of Windsor
Appendix E

University of Windsor

Research Participants Needed (Online Study)

Are you 18 years old or older?

Have you experienced one or more incidents of abuse (physical, emotional, or sexual) or neglect before 15 years old?

If so, please participate in this meaningful research to help understand how people make meaning of abuse/neglect experiences and what influences this process.

For this study, you will be asked to fill out a survey online that includes questionnaires (e.g., background information, experience of childhood maltreatment, psychological functioning, personality, and social support) and short answer questions about the maltreatment event. If this is a concern, please do not participate in this study. This study will take about 60 minutes of your time.

For your time, you will be entered into a draw for 1 in 10 or 10% chance of winning a $50 gift card for Tim Hortons or Amazon.

Please note that this study is not connected to any of your courses and that participation in this study will not be linked to your grades. If you are interested, please contact Na Zhu at narrativestudy@uwindsor.ca.

This research is being supervised by Dr. Julie Hakim-Larson, PhD, University of Windsor. This study has been reviewed and cleared by the Research Ethics Board (REB) at the University of Windsor and St. Clair College. If you have any questions about participant rights and ethical conduct of research, please contact the REB at 519-253-3000, ext. 3848 (University of Windsor) or 519-972-2727, ext. 4234 (St. Clair College).
Title of Study: Narrative Coherence of Child Maltreatment Memories in Adults

You are asked to participate in a research study conducted by Na Zhu, supervised by Dr. Julie Hakim-Larson, from the department of Psychology at the University of Windsor. The results of this study will be used to fulfill the requirements of a PhD dissertation.

If you have any questions or concerns about the research, please feel to contact the primary investigator Na Zhu at zhu13f@uwindsor.ca, or the faculty supervisor, Dr. Julie Hakim-Larson at 519-253-3000 ext. 2241.

PURPOSE OF THE STUDY

The purpose of this study is to examine the narratives of child maltreatment memories in adults. Specifically, the study investigates how adults are making meaning of these unfortunate experiences from their childhood and the possible factors that influence this process.

PROCEDURES

If you volunteer to participate in this study, you will be asked to do the following. By agreeing to this consent form, you are indicating that you wish to participate in the present study. Following endorsement of this consent form, you will be directed to an online survey that includes nine questionnaires. These include questionnaires on your background information, experience and memory of child maltreatment, psychological measures, personality, and social support. You will also be asked to give detailed descriptions of some of your childhood memories and to answer several short-answer questions pertaining to child maltreatment events and their impact. Please note that you will be instructed to refer to others you describe by their roles or relationship to you rather than by their names so that the information you share cannot be connected to your identity during data analysis. Please note that unless you include identifying information within your responses, your responses will not be connected to your identity upon review of the data. Please complete the survey in a quiet place where you are able to concentrate. The survey will take approximately 60 minutes to complete.

After finishing the online survey, you will be directed to a web-page where you can fill in your personal information for the purpose of verifying your bonus credit.

POTENTIAL RISKS AND DISCOMFORTS

During the course of your participation you will be asked questions that are very personal in nature. You may experience discomfort in response to these questions, particularly questions pertaining to your child maltreatment experiences. A risk associated with this study is the possibility of thinking about personal issues that may cause emotional and psychological concerns for you. Please do not participate in this study if you have any concerns about this. If you choose to participate and at any point you feel too overwhelmed or wish to terminate the study, you may do so by exiting the survey browser, and your responses will be deleted. You can also contact the University of Windsor Student Counselling Centre at 519-253-3000 ext. 4616. A longer list of resources will be provided at the end of the study.

POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY

The benefit of participating in this research is the opportunity to learn about and contribute to psychological research. In addition, you may find that you learn more about yourself through participating in this research.
COMPENSATION FOR PARTICIPATION

You will receive 1.0 bonus point towards a psychological course for your effort and 60 minutes of participation, provided you are registered in a psychology participant pool, enrolled in one or more eligible courses, and completed the study. Please note that effort in responding will be assessed, and failure to dedicate appropriate effort (e.g., random responding) will result in denial of credit.

CONFIDENTIALITY

Any information that is obtained in connection with this study will remain confidential; however, portions of your de-identified written responses to questions may be quoted as examples in future publications and conference presentations. Note that we must collect your name and student number at the end of the study in order for you to receive bonus credit for your participation, but these will be deleted at the end of the semester you completed this study and after the credit is awarded. Data analysis will not begin until your name and student number are removed from your responses. Please note that there are legal limits to confidentiality that warrant reporting to authority figures, and these include risks of child abuse or neglect, imminent risk of harm to self or others, and medical malpractice. While the name and student number that were collected for the purpose of assigning bonus points will be deleted before data analysis begins, the limits of confidentiality will apply if you disclose identifying information associated with these incidents in the narrative task. Your data will be encrypted and stored in the University of Windsor data servers. Your de-identified data will be retained for 10 years, at which point it will be securely deleted from the servers.

PARTICIPATION AND WITHDRAWAL

Your participation in this study is completely voluntary. If you decide that you no longer want to participate in the study, you may withdraw your participation at any time by exiting the survey browser, and your responses will be deleted. Please note that there are no negative consequences associated with withdrawal. However, if you choose to withdraw before completing at least 50% of the survey, you will not receive the bonus credit. If you choose to withdraw after completing at least 50% but before fully completing the survey (at least 80%), you will receive half of the bonus point. Once data collection is completed and bonus credits are assigned (at the end of the semester you completed the study), participant contact information will be deleted. After this point, you will be unable to withdraw your data from the study. The investigator may withdraw you from this study if circumstances arise which warrant doing so (e.g., indication of careless or insufficient effort, very incomplete questionnaires).

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE PARTICIPANTS

Research findings for this study will be available to participants and will be posted on the University of Windsor REB website. In addition, a copy of the principal investigator’s PhD dissertation will be available to the public in both the Psychology graduate secretary’s office and Leddy library.

Web address: https://scholar.uwindsor.ca/research-result-summaries
Date when results are available: October 2020

SUBSEQUENT USE OF DATA

These data may be used in subsequent studies, in publications and in presentations.

RIGHTS OF RESEARCH PARTICIPANTS

If you have questions regarding your rights as a research participant, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario, N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: ethics@uwindsor.ca

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.
Na Zhu, MA, PhD Candidate
Department of Psychology
University of Windsor
It is recommended that you print out a copy of this letter of information for your records. It is also recommended that you turn off your pop-up blockers before beginning the survey, and that you use a personal computer rather than a public computer to help protect your privacy. As a further precaution, see the next page for instructions on how to clear the cache and remove identifying information from your internet browser.

SIGNATURE OF RESEARCH PARTICIPANT/LEGAL REPRESENTATIVE

I understand the information provided for the study “Narrative Coherence of Child Maltreatment Memories in Adults” as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I will print a copy of this form for my reference. I understand that brief and de-identified quotations from my written responses may be used in reports and publications.

☐ I do not wish to participate.
CONSENT TO PARTICIPATE IN RESEARCH (non-Participant Pool)

Title of Study: Narrative Coherence of Child Maltreatment Memories in Adults

You are asked to participate in a research study conducted by Na Zhu, supervised by Dr. Julie Hakim-Larson, from the department of Psychology at the University of Windsor. The results of this study will be used to fulfil the requirements of a PhD dissertation.

If you have any questions or concerns about the research, please feel to contact the primary investigator Na Zhu at zhu13f@uwindsor.ca, or the faculty supervisor, Dr. Julie Hakim-Larson at 519-253-3000 ext. 2241.

PURPOSE OF THE STUDY

The purpose of this study is to examine the narratives of child maltreatment memories in adults. Specifically, the study investigates how adults are making meaning of these unfortunate experiences from their childhood and the possible factors that influence this process.

PROCEDURES

If you volunteer to participate in this study, you will be asked to do the following. By agreeing to this consent form, you are indicating that you wish to participate in the present study. Following endorsement of this consent form, you will be directed to an online survey that includes nine questionnaires. These include questionnaires on your background information, experience and memory of child maltreatment, psychological measures, personality, and social support. You will also be asked to give detailed descriptions of some of your childhood memories and to answer several short-answer questions pertaining to child maltreatment events and their impact. Please note that you will be instructed to refer to others you describe by their roles or relationship to you rather than by their names so that the information you share cannot be connected to your identity during data analysis. Please note that you will be asked to provide your name and email address/phone number for the purpose of entering you into a draw for the compensation for your participation. However, unless you include identifying information within your responses, your responses will not be connected to your identity upon review of the data. Please complete the survey in a quiet place where you are able to concentrate. The survey will take approximately 60 minutes to complete.

POTENTIAL RISKS AND DISCOMFORTS

During the course of your participation you will be asked questions that are very personal in nature. You may experience discomfort in response to these questions, particularly questions pertaining to your child maltreatment experiences. A risk associated with this study is the possibility of thinking about personal issues that may cause emotional and psychological concerns for you. Please do not participate in this study if you have any concerns about this. If you choose to participate and at any point you feel too overwhelmed or wish to terminate the study, you may do so by exiting the survey browser, and your responses will be deleted. A list of community resources will be provided to you after this consent form and at the end of the study.

POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY

The benefit of participating in this research is the opportunity to learn about and contribute to psychological research. In addition, you may find that you learn more about yourself through participating in this research.
COMPENSATION FOR PARTICIPATION

You will be entered into a draw for 1 in 10 or 10% chance of winning a $50 gift card for Tim Hortons or Amazon for your effort and 60 minutes of participation, provided that you complete the study. If you are the winner of the gift card, you will be notified via email using the email address you provided at the end of the survey, and you will be asked which of the two gift cards you prefer. Please note that effort in responding will be assessed, and if you complete less than 80% of the study and/or do not display appropriate effort (e.g., random responding), you will not be entered into the draw for the gift card. Please also note that the researcher will determine if you pass the validity criteria and reserves the right to withhold your entry into the draw based on evidence of invalid responses. You will be notified if your data are determined to be invalid and your name removed from the draw.

CONFIDENTIALITY

Any information that is obtained in connection with this study will remain confidential; however, portions of your de-identified written responses to questions may be quoted as examples in future publications and conference presentations. Note that we must collect your name and email address/phone number in order to enter you into the draw for the gift cards, but these will be deleted as soon as the credit is awarded. Data analysis will not begin until your name and email address/phone number are removed from your responses. Please note that there are legal limits to confidentiality that warrant reporting to authority figures, and these include risks of child abuse or neglect, imminent risk of harm to self or others, and medical malpractice. While the name and contact information that were collected for the purpose of entering you into the draw for compensation will be deleted before data analysis begins, the limits of confidentiality will apply if you disclose identifying information associated with these incidents in the narrative task. Your data will be encrypted and stored in the University of Windsor data servers. Your de-identified data will be retained for 10 years, at which point it will be securely deleted from the servers.

PARTICIPATION AND WITHDRAWAL

Your participation in this study is completely voluntary. If you decide that you no longer want to participate in the study, you may withdraw your participation at any time by exiting the survey browser, and your responses will be deleted. Please note that there are no negative consequences associated with withdrawal. However, if you choose to withdraw before completing at least 80% of the survey, you will not receive the compensation. Once data collection is completed and winners for the gift cards are drawn, participant contact information will be deleted. After this point, you will be unable to withdraw your data from the study. The investigator may withdraw you from this study if circumstances arise which warrant doing so (e.g., indication of careless or insufficient effort, very incomplete questionnaires).

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE PARTICIPANTS

Research findings for this study will be available to participants and will be posted on the University of Windsor REB website. In addition, a copy of the principal investigator’s PhD dissertation will be available to the public in both the Psychology graduate secretary’s office and Leddy library.

Web address: https://scholar.uwindsor.ca/research-result-summaries
Date when results are available: October 2020

SUBSEQUENT USE OF DATA

These data may be used in subsequent studies, in publications and in presentations.

RIGHTS OF RESEARCH PARTICIPANTS

If you have questions regarding your rights as a research participant, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario, N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: ethics@uwindsor.ca

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.
Na Zhu, MA, PhD Candidate
Department of Psychology
University of Windsor
NARRATIVE COHERENCE OF MALTREATMENT MEMORIES

It is recommended that you print out a copy of this letter of information for your records. It is also recommended that you turn off your pop-up blockers before beginning the survey, and that you use a personal computer rather than a public computer to help protect your privacy. As a further precaution, see the next page for instructions on how to clear the cache and remove identifying information from your internet browser.

SIGNATURE OF RESEARCH PARTICIPANT/LEGAL REPRESENTATIVE

I understand the information provided for the study “Narrative Coherence of Child Maltreatment Memories in Adults” as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I will print a copy of this form for my reference. I understand that brief and de-identified quotations from my written responses may be used in reports and publications.

☐ I do not wish to participate.
Below you will find a list of community mental health resources that you may find helpful. Please save or print a copy of this list.

### Windsor-Essex Area:

<table>
<thead>
<tr>
<th>Resource</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student Counselling Centre, University of Windsor</strong></td>
<td>293 CAW Centre, 401 Sunset Ave. Windsor, ON N9B 3P4 Tel: (519) 253-3000 Ext. 4616</td>
</tr>
<tr>
<td><strong>On-Campus Counselling Services, St. Clair College</strong></td>
<td>Windsor: (519) 972-2727, ext. 4226 Chatham: (519) 354-9100, ext. 3306 Centre for the Arts: (519) 972-2727, ext. 4348 <a href="http://www.stclaircollege.ca/studentservices/counsellingservices.html">http://www.stclaircollege.ca/studentservices/counsellingservices.html</a></td>
</tr>
<tr>
<td><strong>Community Crisis Centre of Windsor-Essex County, Jeanne Mance Bldg</strong></td>
<td>1986 Ouellette Ave, 1st Floor, Windsor, ON Tel: (519) 973-4435 24-hr Crisis Phone &amp; 1 on 1 crisis intervention</td>
</tr>
<tr>
<td><strong>Windsor Family Health Centre, St. Clair College</strong></td>
<td>Main Campus: 2000 Talbot Rd. West, Room 164 (main lobby), Mon-Fri 8:30-4:00 519-972-2380</td>
</tr>
<tr>
<td><strong>Distress Centre of Windsor-Essex County</strong></td>
<td>Crisis Phone: (519) 256-5000 (12 noon – 12 midnight)</td>
</tr>
<tr>
<td><strong>Downtown Campus</strong>: 201 Riverside Dr. W., Room B104 (basement), Tue-Thu 8:30-4:00 519-972-2380</td>
<td></td>
</tr>
<tr>
<td><strong>Chatham Campus</strong>: 1001 Grand Ave. W., Room 147, Mon-Fri 8:00-4:00 519-354-9100, ext. 3800</td>
<td></td>
</tr>
<tr>
<td><strong>Family Service Windsor-Essex County</strong></td>
<td>1770 Langlois Ave, Windsor, ON N8X 4M5 Short-term counselling, subsidized; walk-in counselling clinic (Tues &amp; Fri) Tel: (519) 966-5010</td>
</tr>
<tr>
<td><strong>Canadian Mental Health Association</strong></td>
<td>1400 Windsor Ave. Windsor, ON, N8X 3L9 Tel: (519) 255-7440 (Services include support workers, advocacy services, group programs, counselling for depression &amp; anxiety)</td>
</tr>
</tbody>
</table>

### Ontario- and Canada-wide:

<table>
<thead>
<tr>
<th>Service</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mental Health Helpline</strong></td>
<td>Information about mental health services in Ontario; Service is 24/7 Tel: 1-866-531-2600</td>
</tr>
<tr>
<td><strong>Good 2 Talk</strong></td>
<td>Post-Secondary Student Helpline Free, professional &amp; anonymous support Tel: 1-866-925-5454</td>
</tr>
<tr>
<td><strong>Crisis Services Canada</strong></td>
<td>Services in English/French, available 24/7 Toll-free: 1833-456-4566</td>
</tr>
<tr>
<td><strong>Canadian Mental Health Association (CMHA)</strong></td>
<td>Find your closest CMHA: <a href="https://cmha.ca/find-your-cmha">https://cmha.ca/find-your-cmha</a> Tel: 416-646-5557 Email: <a href="mailto:info@cmha.ca">info@cmha.ca</a> (Services include support workers, advocacy services, group programs, counselling for depression &amp; anxiety)</td>
</tr>
</tbody>
</table>
Thank you for taking the time to complete this study. We appreciate your assistance. The purpose of this study is to examine how people make meaning of their child maltreatment experiences, factors that affect this process, and whether having a sense of coherence of these unfortunate events is related to psychological outcome and life satisfaction. Child maltreatment is associated with a host of negative psychological health outcomes, but many people are able to overcome the adversity associated with their past. Thus, the study is designed to better understand how and why some people are able to adapt well in spite of their childhood histories.

Feel free to contact the primary researcher (Na Zhu, zhu13f@uwindsor.ca) or research supervisor (Dr. Julie Hakim-Larson; hakim@uwindsor.ca) if you have any comments, questions or concerns.

In the following page, you will find a list of community and campus mental health resources that you may find helpful. Please feel free to forward this survey along to anyone that you think may be interested. Your help is greatly appreciated.
VITA AUCTORIS

<table>
<thead>
<tr>
<th>NAME</th>
<th>Na Zhu</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLACE OF BIRTH</td>
<td>Fuzhou, China</td>
</tr>
<tr>
<td>YEAR OF BIRTH</td>
<td>1987</td>
</tr>
<tr>
<td>EDUCATION</td>
<td>Riverdale Collegiate Institute, Toronto, Ontario, 2005</td>
</tr>
<tr>
<td></td>
<td>McMaster University, B.A. Hons., Hamilton, Ontario, 2009</td>
</tr>
<tr>
<td></td>
<td>University of Toronto, M.Ed., Toronto, Ontario, 2012</td>
</tr>
<tr>
<td></td>
<td>University of Windsor, M.A., Windsor, Ontario, 2017</td>
</tr>
<tr>
<td></td>
<td>University of Windsor, Ph.D., Windsor, Ontario, 2020</td>
</tr>
</tbody>
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