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OVERGENERAL MEMORY: AN INVESTIGATION OF THE DEFENSIVE
EXCLUSION AND FUNCTIONAL AVOIDANCE HYPOTHESES

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Overgeneral memory: An investigation of the defensive exclusion and functional avoidance hypotheses

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Research shows that people experiencing trauma and elevated symptoms of depression and PTSD generate overgeneral autobiographical memories. It has been proposed that this phenomenon is the result of functional avoidance—actively avoiding thoughts that would elicit unwanted negative affect. Curiously, the functional avoidance hypothesis of overgeneral memory (OGM) overlaps conceptually with attachment theory’s concept of defensive exclusion. The current study tests whether a model of defensive exclusion predicts the presence of OGM and whether variables underlying the functional avoidance hypothesis (i.e., trauma exposure, PTSD, and depression) account for a significant amount of variance in OGM above and beyond the defensive exclusion model. Three-hundred and thirty adults completed an untimed version of the minimal instructions autobiographical memory test (AMT) online, and a series of questionnaires related to cognitive avoidance, depression, PTSD, trauma exposure, and adult attachment. The proportion of categoric memories generated on the AMT represented the construct of OGM in the current study. A significant positive correlation was found between cognitive avoidance and the proportion of categoric memories on the AMT, indicating that people reporting higher levels of cognitive avoidance also generate more overgeneral categoric memories on the AMT. Contrary to expectations, attachment avoidance did not moderate the relationship between cognitive avoidance and OGM nor did this interaction significantly predict the presence of OGM. In addition, self-reported trauma exposure, PTSD, and depression did not predict the presence of OGM. Consistent with prior research, data indicate that people reporting higher levels of cognitive avoidance also generate more categoric memories on the AMT. Contrary to expectations, adult attachment avoidance did not moderate the relationship between cognitive avoidance and OGM. Further, trauma exposure, PTSD, and depression were unrelated to OGM. Findings are discussed in the context of methodological differences using the AMT.

Overgeneral memory: An investigation of the
defensive exclusion and functional avoidance hypotheses

Introduction

Life memories tell us something about remembering and about the rememberer.

John A. Robinson (1986 p. 19)

John A. Robinson's statement about the insights that can be gleaned from memories has become somewhat prophetic over the past four decades. Researchers have observed an interesting phenomenon in the qualitative features of remembered personal events. In their seminal study, Williams and Broadbent (1986) noticed that patients with depression tended to generate memories that contained few specific details about past personal events in response to emotional cue words. Specifically, the patients recalled memories that summarized frequently occurring events (e.g., "going to the store") rather than identifying an event that occurred at a specific moment (e.g., "the day my daughter was born"). Researchers have since labeled this phenomenon with terms such as *reduced autobiographical memory specificity* and *overgeneral memory* (OGM).

In the decades following Williams and Broadbent's publication, research has shown that OGM is associated with several clinical variables such as depression and PTSD (Ono et al., 2016; Sumner et al., 2010; Valentino et al., 2009) and trauma exposure (Barry et al., 2018). Additionally, OGM has been established as a cognitive vulnerability for depression (Boelen et al., 2014; Sumner et al., 2010; van Minnen et al., 2005) and a risk factor for the development of PTSD (Bryant et al., 2007). Understanding the etiology of OGM has been an important endeavor among researchers.

Functional Avoidance

One of the most cited explanations of OGM is the *functional avoidance hypothesis*. The functional avoidance hypothesis posits that remembering past negative experiences in an overgeneral manner helps regulate affect, such that negative emotional states are down-regulated to achieve more desirable emotional states (Hermans et al., 2005; Raes et al., 2003; Raes et al., 2006; Williams et al., 2007). Strong empirical support exists for the affect-regulation hypothesis of OGM. For example, Raes et al. (2003; 2006) grouped participants according to their propensity to recall more- or less-specific autobiographical memories and then assigned them to an experimental stress manipulation in which they were either exposed to a stressful or non-stressful task. Across both studies, those exhibiting a propensity to recall less-specific autobiographical memories who were exposed to a stressful task not only reported significantly less emotional distress following the stressful task, but they also reported fewer intrusive memories of the task afterward. Thus, it appears that recalling less-specific memories may be advantageous because it minimizes the psychological aftermath following an unpleasant experience.

Additional support for the functional avoidance hypothesis comes from correlational studies investigating the relationship between coping styles and autobiographical memory performance. Several studies report that coping styles characterized by attempts to either suppress or repress unpleasant memories and emotional experiences is associated with a reduction in autobiographical memory specificity (Geraerts et al., 2012; Hermans et al., 2005). For example, Hermans et al. (2005) found that people reporting higher levels of self-reported cognitive avoidance provided fewer specific memories. In addition, research shows that avoidant coping strategies are related to more OGM following an acute stressor in people with no known

psychiatric conditions (Debeer et al., 2012). Together, these studies illustrate that coping styles characterized by suppression and repression are associated with autobiographical memory performance that reflects the coping strategies. Moreover, the relationship between avoidant coping behaviors and OGM is consistent with theoretical accounts of how autobiographical memories are constructed.

The Autobiographical Memory System

The functional avoidance hypothesis of OGM draws upon Conway and Pleydell-Pearce's (2000) model of autobiographical memory. According to Conway and Pleydell-Pearce, autobiographical memories reflect a dynamic mental process that integrates multiple pieces of information stored in long-term memory such as life themes, time periods, and general events to create a coherent narrative about a person's lived experience (Conway & Pleydell-Pearce, 2000). The information used to construct autobiographical memories is drawn from autobiographical knowledge and episodic memories (Conway, 2005).

Autobiographical knowledge is composed of highly abstract and conceptual knowledge about a person's lived experience. This knowledge is organized hierarchically into three categories, with *life themes* at the top of the hierarchy followed by *lifetime periods* then *general events*. Each category is presumed to trigger cues that are connected to memories within each category. For example, the life theme "father" would contain cues attached to a lifetime period such as "in my early twenties," which would cue other memories associated with general events such as "changing diapers." As people move down the hierarchy of autobiographical knowledge during recall, they are more likely to access episodic memories attached to various events.

According to Conway (2005), episodic memories constitute a separate memory system from the autobiographical knowledge base and contain sensory-perceptual (e.g., the surrounding

environment during an experience) and conceptual-affective (e.g., the feeling of joy) information attached to certain events. Episodic memories help provide rich detail to remembered experiences. Conway (2005) asserts that “specific” autobiographical memories arise when episodic memories are integrated with general events. Importantly, the integration of episodic memories with autobiographical knowledge depends largely on control processes.

Direct and Generative Autobiographical Memory Retrieval

Research shows that when people are prompted to recall an experience from the past, they typically engage in either a generative or direct search process until they recall what it is they hoped to recall (Conway, 2005; Conway & Pleydell-Pearce, 2000). During *generative retrieval*, memory cues are elaborated upon and evaluated multiple times until episodic details are retrieved and a coherent memory can be formed (Conway, 2005). This generative search is subject to control processes that are influenced by internal goals that help filter out irrelevant information during the memory search process. For example, looking at a photograph of a childhood home would likely evoke a host of associated memories related to a time period such as friends, events, and other episodic memories. If the goal is to experience fondness and nostalgia of one’s childhood, certain memories will be brought to mind while others will be omitted from, or allowed to remain in, conscious awareness. Such generative retrieval processes tend to facilitate specific memories marked by a detailed account of when an event occurred. In contrast, *direct retrieval* is marked by a quick recollection of episodic memories that are strongly associated with autobiographical knowledge such as general events or time periods (Conway, 2005). Consequently, memory cues have the potential to trigger vivid and specific autobiographical memories because of the strong association between autobiographical knowledge and episodic details and environmental cues.

Disrupted Encoding and Retrieval Processes

What is ultimately remembered appears to be influenced by two processes: (1) how well new experiences are encoded and (2) the internal goals of a person during memory retrieval. Drawing upon Conway and Pleydell-Pearce (2000), Williams et al. (2007) assert that autobiographical memories are likely to be overgeneral if the encoding process is disrupted. For example, someone who is distracted by internal thoughts during a family dinner is less likely to encode crucial episodic details surrounding this experience because they were not attending to what was happening around them. Consequently, this person will likely recall an overgeneral account of the event because many episodic details were not encoded into long-term memory. Episodic details that have been encoded into long-term memory and linked to autobiographical knowledge can also be omitted during memory retrieval and result in overgeneral remembering. According to Williams et al. (2007), episodic details that are likely to evoke distress or challenge a person's internal goals are more likely to be blocked during memory retrieval because of the resulting effect on a person's emotional state. Both processes, be it disrupted encoding or retrieval, appear to be affected by internal goals that are active at any given time.

The Working-Self

A central feature of Conway and Pleydell-Pearce's (2000) model of autobiographical memory is that memory is motivated and influenced by internal goals. In this model, it is presumed that people are motivated to remember events and experiences in a manner that maintains a sense of coherence (Conway, 2005). The driving force behind maintaining a coherent sense of one's self is the *working-self*. The working-self represents a hierarchy of internal goals that are active at any given time and direct the flow of information moving through the working memory system. Of note, the working-self is thought to embody attitudes, beliefs,

and ideas about one's self that are directly connected to both the autobiographical knowledge base and the episodic memory system. Importantly, the goal structure of the working-self influences the construction of autobiographical memories by exerting control over the encoding of new information and the access-stored knowledge in long-term memory (Conway, 2005). For example, the working-self may make some memories more accessible than others (e.g., remembering a success over a failure) when a person elaborates upon memory cues. In other instances, the working-self may divert attention away from thoughts and experiences that challenge a person's sense of self or identity and thereby disrupt the encoding process. The working-self thus facilitates the construction of memories that are coherent with the themes and expectations people have about themselves by modulating what is encoded into, and/or retrieved from, long-term memory.

By modulating both the encoding of new memories and the retrieval of memories from long-term memory, the working-self plays a key role in the functional avoidance hypothesis of overgeneral memory. For some people, particularly those who have experienced trauma, remembering vivid episodic details may trigger intense physiological arousal and fear that could lead to thoughts about one's self that are incoherent and distressing. Given that the working-self is motivated to maintain a sense of coherence, such episodic memories will likely be omitted from memory when the person is cued to remember an experience that is closely tied to the traumatic event. Omitting episodic memories from awareness ensures that the autobiographical memory that is generated will be kept to general events that evoke minimal, if any, affect. Consequently, remembering events in an overgeneral manner is negatively reinforced because it reduces the likelihood that distressing episodic memories will be brought to mind and threaten a person's sense of self (Williams et al., 2007). Repeatedly remembering past experiences in this

manner facilitates a style of direct memory retrieval that rapidly brings to mind general events stripped of episodic details. Thus, the working-self facilitates coherence by blocking the retrieval of certain episodic memories that ultimately promotes a coping style characterized by cognitive avoidance (Williams et al., 2007).

Conway and Pleydell-Pearce's (2000) model of autobiographical memory sheds important light on the functional avoidance hypothesis and the etiology of OGM. However, the working-self and its relationship with the functional avoidance hypothesis of OGM resembles a much older coping mechanism tucked away in the catacombs of the theory of attachment—John Bowlby's (1969c) *defensive exclusion hypothesis*.

Resurrecting Defensive Exclusion

Bowlby's (1969c) defensive exclusion hypothesis describes two conditions that would lead to information being excluded from conscious processing. First, information that is stored in long-term memory may be blocked from conscious processing—a phenomenon Bowlby likened to “amnesia” (p. 45). Second, incoming sensory information may be blocked from further conscious processing at the stage of encoding. Both parallel the retrieval and encoding deficits described in Williams et al.'s (2007) theory of functional avoidance that is based on Conway and Pleydell-Pearce's (2000) model of autobiographical memory. Importantly, defensive exclusion arises from internal working models that are forged early in life through interpersonal transactions that influence attitudes, beliefs, emotional reactivity, attention, and memory. The idea that internal working models modulate higher-order cognitive processes like attention and memory retrieval parallels that of the working-self described by Conway and Pleydell-Pearce (2000). Moreover, Conway (2005) explicitly states that the working-self contains “conceptual aspects of internal working models.” Thus, it seems that Bowlby's theory of defensive exclusion

may also explain the presence of overgeneral autobiographical memory. What follows is a brief overview of attachment theory and evidence linking internal working models to cognitive processes that are implicated in the development of overgeneral autobiographical memory.

Attachment Theory

Attachment theory is a robust theory of personality development that explains how people develop mental representations about the world and themselves through early transactions with primary caregivers. These mental representations play a critical role in modulating behavior later in life. For example, the mental representations children develop in response to early interpersonal transactions are presumed to influence the expectations they have about the world and themselves as adults. The mental representations people develop through early interpersonal transactions form what attachment theorists call *internal working models*.

According to attachment theory, internal working models represent cognitive maps of the world that help people navigate and make sense of their environment. These figurative maps facilitate the planning of various behavioral goals to achieve desired outcomes. For example, a person may possess an internal working model of how to interact with others in order to obtain their affection, and that helps the person choose what actions to take to receive affection. As internal working models are shaped through social transactions in the environment, people begin to develop identifiable patterns of behavior that reflect the architecture of their internal working models.

Attachment Styles

Decades of observational and experimental research have revealed several attachment styles that capture distinct patterns of behavior and serve as indices of a person's internal working models (Bartholomew & Horowitz, 1991; Main et al., 1985). The three most commonly

observed and studied attachment styles are *secure*, *anxious*, and *avoidant* and were described by Ainsworth et al. (1971) in their work with children. According to Ainsworth et al. (1971; 1978), a *secure* attachment style is characterized by reliable expectations a child holds that its caregiver will be attentive to its needs and available and responsive when a need is communicated, especially in times of distress. An *anxious* attachment style is characterized by uncertainty about whether a caregiver will be available due to past experience. Such uncertainty breeds anxiety about the caregivers' availability and responsiveness. Lastly, an *avoidant* attachment style is characterized by inhibited emotional responses in situations that typically evoke strong emotions (e.g., separation from caregivers) and disinterest in maintaining or reestablishing close proximity with caregivers. Researchers also classify the above attachment styles as either *secure* or *insecure* (i.e., anxious or avoidant). Importantly, research shows that the attachment style a person embodies in childhood remains rather stable into adulthood.

Stability of Attachment

Several longitudinal studies have demonstrated that infants' attachment styles are moderately stable over time (Allen et al., 2004; Ammaniti et al., 2010; Hamilton, 2000; Scharfe & Bartholmew, 1994; Waters, 1978; Waters et al., 2000; Weinfield et al., 2004; Zayas et al., 2010; Zhang & Labouvie-Vief, 2004). For example, Waters et al. (2000) used the strange situation to classify infants' attachment style and found that attachment classifications remained moderately stable (72%) over a 20-year period. In contrast, others report that attachment styles are far less stable across time (Davila et al., 1997; Pinquart et al., 2013; Vondra et al., 2001). A recent meta-analysis of attachment stability studies by Pinquart et al. (2013) revealed that the stability of attachment styles across time dropped considerably for 5-year intervals and more dramatically for intervals 15-years and beyond. Other reviews conclude that although attachment

styles are less stable than would be expected according to Bowlby's theory, the evidence indicates that early-childhood experiences with attachment figures that shape internal working models have an enduring, though modest, influence on later attachment behaviors and personality development (Fraley, 2002; Fraley & Brumbaugh, 2004). Importantly, the data from these two reviews suggest that the internal working models of self and others formed during childhood function to form default expectations about the world throughout life. Further, these default expectations can be corrected and updated in response to new life experiences, whether positive or negative (Fraley, 2002; Fraley & Brumbaugh, 2004). Taken together, the evidence to date suggests that the goal structure of internal working models forged in childhood that configure secure and insecure attachment styles have an enduring influence on behavior.

Attachment-Related Behaviors

The attachment styles identified by Ainsworth et al. (1971) have been shown to have a profound influence on behavior, including how people process social and emotional sensory information, what people pay attention to, and how people remember past experiences.

Emotions and the Attachment System

Attachment theory asserts that a fundamental human need is proximity to and intimacy with caregivers early in life and, more so, significant others in adulthood (Bowlby, 1988; Collins & Read, 1994). This need propels people to seek proximity to key interpersonal relationships when negative emotions are evoked, such as fear and sadness. It is in this interaction that infants and young children learn how to regulate their emotions. For example, if a caregiver is responsive, attentive, and sensitive to her child's emotional needs when the attachment system is activated following perceived threats to proximity and intimacy (i.e., fostering secure attachment), the child will learn that such emotions are appropriate to express and that they can

seek and obtain support in such times. In contrast, when a caregiver is unresponsive or dismissing of her child's attempts to seek proximity and intimacy or inconsistent in her attempts to assuage her child's fears and model appropriate emotional support (i.e., fostering insecure attachment), her child will have difficulty learning how to cope effectively when the attachment system is activated. The consequences of these early transactions between child and caregiver will be woven into the fabric of internal working models and will influence how people experience and regulate intense emotional states.

People behave in predictable ways depending on their attachment style. For example, people embodying a secure attachment style learn (a) that they can express their emotions; (b) how to reappraise negative events; (c) how to solve problems related to emotional states; (d) and how to integrate new information with existing schemas to respond flexibly to current demands (Shaver & Mikulincer, 2007). In contrast, people embodying an anxious attachment style are more likely to experience emotions more intensely than people exhibiting secure and avoidant attachment styles. They are also likely to make their emotional states known to others, stall efforts to seek assistance in times of distress, and demonstrate poor problem solving because doing so may reduce the attention they wish to obtain from others (Shaver & Mikulincer, 2007). Furthermore, people embodying an avoidant attachment style are more likely to (a) suppress negative emotions; (b) deactivate the attachment system; (c) deny the presence of certain emotions and memories associated with the attachment system; (d) direct their attention away from emotionally salient stimuli; (e) blunt additional processing of emotional information; and (f) and adopt avoidant and/or repressive coping strategies (Shaver & Mikulincer, 2007; Romero et al., 2020; Vetere & Myers, 2002). Thus, the attachment styles people develop over time have a profound influence on how they respond to emotional stimuli.

Internal Working Models and Information Processing. The relationship between attachment styles and emotional functioning has important implications for how people process incoming sensory-perceptual information that is related to the attachment system. Considerable evidence exists for the notion that internal working models underlying attachment styles influence how people process a range of social and emotional information across the lifespan (Dykas & Cassidy, 2011).

Children and Adolescents. Research with young children shows that infants process information in their environments in ways that are consistent with their attachment style. For example, infants classified as securely attached spent more time looking at images illustrating an unresponsive attachment figure compared to images that reflected a secure attachment figure (Johnson et al., 2007; Johnson et al., 2010). In contrast, insecurely attached infants gazed longer at images depicting a secure attachment figure compared to an insecure attachment figure (Johnson et al., 2010). These data highlight how the internal working models of an infant pick up on discrepancies in the infant's environment and process them in more depth because such discrepancies are inconsistent with the infant's model of the world. For the infants classified as having an insecure attachment, directing their gaze toward the securely attached depictions as opposed to the insecure depictions illustrates how internal working models work to avoid information that would evoke distress, whereas securely attached infants can process such information openly.

Similar findings have been observed among older children as well. For example, studies show that young children will look at family pictures and drawings depicting attachment-related themes differently depending on their attachment style classification when they were infants (Kirsh & Cassidy, 1997; Main et al., 1985). For example, children embodying a more avoidant

attachment style, compared to a secure attachment style, spent more time looking away from drawings of attachment themes. Escobar et al. (2013) found that insecurely attached adolescents were slower and less accurate at classifying faces and words as either positive or negative, especially when faces and words were negatively valenced, compared to securely attached adolescents. These findings indicate that adolescents with an insecure attachment style have greater difficulty processing information conveying emotional states, which may be due to an unconscious effort to ignore unpleasant stimuli. Together, these findings support the notion that the internal working models underlying secure and insecure attachment styles influence how young children process social information.

Adults. Research with adults also suggests that internal working models play an important role in how people process information in their environment. Several studies consistently show that adults reporting a combination of high attachment avoidance and anxiety tend to divert their attention away from attachment-related information compared to adults low in attachment avoidance and anxiety (Dewitte & De Houwer, 2008; Dewitte et al., 2007). Additionally, adults reporting high attachment anxiety allocate more attentional resources to negative images, which capture how the internal working models underlying attachment anxiety propel people to be more sensitive to information that would threaten their relationships (Zilber et al., 2007). Zheng et al. (2015) found that adults high in attachment avoidance initially allocate more attention to emotional, compared to neutral, information during the encoding stages of information processing and attempt to suppress this information during memory recognition. Moreover, Dewitte and Koster (2014) found that adult men reporting high attachment avoidance display a passive attentional style when primed with an attachment threat compared to men classified as having a secure attachment. These studies highlight how the internal working

models underlying attachment avoidance and anxiety in adults either propel adults to avoid or intensely approach emotional information, respectively.

Internal Working Models and Memory. If attachment styles influence how people process information, particularly how much attention they give to emotional experiences, then internal working models are likely to influence how people remember past emotional events, especially events that threatened the attachment system. Indeed, research shows that internal working models influence how people remember the past.

Children and Adolescents. Research with children shows that a child's attachment style classification is related to their memory performance for events. Krish and Cassidy (1997) found that young children classified as having a secure attachment style remembered details from a story depicting a secure relationship better than children classified as avoidant. Chae et al. (2018) found that children displaying a more secure attachment style remembered more details about a child-parent interaction than children displaying an insecure attachment style. Additionally, Alexander et al. (2010) found that attachment security positively predicted young children's memory performance of attachment-related events, indicating that the internal working models associated with a secure attachment allow children to reflect upon events that evoke the attachment system in a way that is adaptive. Moreover, Dykas et al. (2014) found that adolescents classified as having a dismissive attachment style characterized by avoidance had poorer memory for childhood experiences associated with attachment themes. These studies illustrate how internal working models associated with an insecure attachment style seem to disrupt how children remember the past, particularly when they have to remember past events that contain attachment-related themes.

Adults. Internal working models in adulthood are also associated with memory functioning. In a series of studies, Baldwin et al. (1996) demonstrated that adults are capable of retrieving different attachment-related memories reflecting specific attachment styles. Adults also identified more past relationships reflecting their own attachment style. For example, adults exhibiting an avoidant attachment style recalled more past relationships reflecting avoidant attachment patterns. In addition, the ease by which adults recalled previous relationships that matched an exemplar attachment relationship was associated with adults' attachment styles. For example, adults characterized as avoidant were able to recall past experiences reflecting an avoidant attachment pattern more easily than adults with a secure or anxious attachment style. According to Baldwin et al. (1996), these data suggest that the memories people have access to, and the ease by which these memories come to mind, reflect the internal working models within their attachment system. Although adults were capable of recalling multiple past relationships reflecting different attachment styles, it was the frequency and accessibility of specific past experiences that corresponded with their attachment style. Moreover, adults with avoidant or anxious attachment styles recalled more secure than insecure relationship experiences, suggesting that the accessibility of insecure attachment experiences, though few compared to secure experiences, is reflective of their internal working models of the self and others. Thus, what people remember about past relationships appears to reflect their internal working models.

Other studies have found a different relationship between insecure attachment styles and memory performance. Mikulincer and Orbach (1995) found that secure adults had little trouble retrieving negative attachment-related memories based on the time it took them to recall memories. However, adults with an anxious attachment style had the fastest response time when recalling negative attachment-related memories whereas adults with an avoidant attachment style

took the longest to recall such memories. According to Mikulincer and Orbach (1995), the ease of memory accessibility of anxious and avoidant adults fits well with attachment theory. The easily recalled memories for negative events among anxiously attached adults reflect their disposition to be highly attentive to interpersonal threats to the attachment system. Consistent with the research on attention and information processing, this would facilitate the encoding and storage of negative interpersonal experiences and would make them highly accessible upon retrieval. The slower retrieval of negative attachment-related experiences found among avoidant adults reflects their defensive coping strategies, which are to deactivate and suppress emotions that would trigger the attachment system. Because avoidantly attached individuals suppress their emotional experiences, this information is less likely to be rehearsed in working memory and transferred to long-term memory, hence the relative inaccessibility of such experiences.

In a series of studies, Pereg and Mikulincer (2004) found that attachment styles in adulthood predicted recollection of positive and negative events unrelated to attachment content in ways consistent with attachment theory following a negative mood induction. Specifically, adults reporting a secure attachment style remembered more details from a positively valenced news headline when they experienced an increase in negative affect. This is consistent with previous research indicating that securely attached individuals have greater access to positive cognitions that reflect the structure of their internal working models and facilitate a coherent self-narrative. In contrast, adults reporting an avoidant attachment style did not show any significant differences in memory recall for positive or negative events following a negative mood induction. According to Pereg and Mikulincer (2004), such a finding reflects the deactivation strategies of internal working models underlying the dismissive attachment style. In contrast, anxiously attached adults remembered more negative and fewer positive details from news

headlines when induced with a negative mood, reflecting the hyperactive nature of attachment anxiety when attachment threat is signaled by negative mood.

The documented relationship between memory performance for attachment-related and unrelated information and self-reported attachment styles is not confined to experimental studies. Edelstein et al. (2005) interviewed over a hundred child sexual abuse survivors in adulthood about their abuse, gathering information such as age at the time of abuse, frequency, and details of the abuse. Adults reporting an avoidant attachment style recalled fewer details and were less accurate about the events surrounding their abuse when the severity of their abuse was high compared to non-avoidant adults. Although avoidant adults were less likely to discuss their abuse with others, disclosing the event with others did not have a significant effect on memory recall, that is, rehearsing the event to another person did not appear to facilitate storage of the information in long-term memory. According to Edelstein et al. (2005), such a finding lends support to the notion that avoidant individuals block distressing attachment-related information at the stage of encoding. Because Edelstein et al. (2005) understandably had no control over whether participants rehearsed or could retrieve more information with contextual cues, it is possible that the victims of abuse defensively blocked distressing memories associated with abuse during retrieval. Based on this evidence, it is difficult to tease apart whether victims of abuse defensively block information at the stage of encoding or during retrieval.

Internal Working Models and Memory Encoding. There is some evidence available to suggest that internal working models thwart the encoding of attachment-related information. For example, Fraley et al. (2000) found that attachment avoidance in a sample of adults was negatively correlated with adults' immediate recall of an audio recording depicting an attachment-related theme (e.g., loss of a family member) and significantly predicted adults'

recall performance above that of attachment anxiety. Similarly, Edelstein (2006) found that adults reporting high attachment avoidance, compared to low avoidance, remembered significantly fewer attachment-related words (positive and negative) but not neutral or emotional words on a working memory task. The findings from these two studies suggest that attachment avoidance in adulthood seems to thwart the encoding of new information, particularly when such information contains secure and insecure attachment-related themes. Moreover, these studies support Bowlby's proposition that the attachment system can defensively exclude information from further processing in the early stages of information processing.

In summary, there is ample evidence indicating that internal working models affect how people process incoming sensory-perceptual information and that this is accomplished by modulating attention toward or away from attachment-related information. Additionally, internal working models appear to influence how people remember past events in ways that are consistent with secure and insecure attachment styles. Given the robust findings of attachment-related biases in attention and accumulating evidence that internal working models disrupt the encoding of new information containing attachment themes, it seems plausible that autobiographical memory for personal events linked to the attachment system could be impaired depending on a person's attachment style.

Indeed, several researchers have made connections between Bowlby's (1969c) theory of attachment as well as his notion of defensive exclusion and autobiographical memory development (Chae et al., 2011). Others have proposed compelling theories of information processing based on Bowlby's theory of attachment (Dykes & Cassidy, 2011), and some have even made explicit connections between OGM and Bowlby's theory attachment (e.g., Valentino,

2011). Despite these recent theoretical papers, hardly any research has been devoted to elucidating the relationship between Bowlby's defensive exclusion hypothesis and OGM.

The Present Study

The primary aim of the present study is to examine whether attachment avoidance moderates the relationship between cognitive avoidance and OGM. Prior research shows that coping styles characterized by a tendency to suppress and/or block unwanted thoughts and painful memories are associated with OGM. Notably, a key feature of attachment avoidance is suppressing and/or repressing distressing thoughts to maintain a sense of coherence and regulate affect, and research shows that attachment avoidance is related to cognitive avoidance and biases in information processing and memory performance that would likely promote overgeneral remembering. For example, studies show that attachment avoidance is associated with (a) inhibited retrieval of positive and negative attachment-related information (Byrow et al., 2016); (b) directing attention away from attachment-related information (Dewitte et al., 2006, 2007a); (c) poor working memory for positive and negative attachment-related words (Edelstein, 2006); (d) difficulty retrieving negative attachment-related memories (Mikulincer & Orbach, 1995); and (e) impaired memory for positive and negative autobiographical events (Öner & Gülgöz, 2016). Taken together, adults exhibiting high attachment avoidance would presumably remember fewer episodic details about positive and negative events linked to the attachment system given their proclivity to direct their attention away from attachment-related events. Therefore, it is hypothesized that (1) higher levels of cognitive avoidance would be positively associated with OGM; (2) attachment avoidance would magnify the effect of cognitive avoidance on OGM when attachment avoidance is high; and (3) the magnifying effect of attachment avoidance on the

relationship between cognitive avoidance and OGM would predict a significant amount of variance in OGM.

Lastly, research shows that trauma exposure as well as PTSD and depression severity are correlated with OGM (Barry et al., 2018; Ono et al., 2016; Sumner et al., 2010; van Vreeswijk & de Wilde, 2004) and would likely account for a significant amount of variance in OGM. It is possible that the moderating effect of attachment avoidance on the relationship between cognitive avoidance and OGM, should it exist, may wash out when the effects of trauma exposure, PTSD, and depression on OGM are considered. Therefore, additional analyses will be carried out to examine whether adding clinical variables known to be associated with OGM (e.g., depression, PTSD, and trauma exposure) would add additional explained variance to OGM above and beyond the interaction between cognitive avoidance and attachment avoidance.

Methods

Participants

Participants were recruited through Amazon's Mechanical Turk (MTurk)—an online crowdsourcing platform that allows people from the general population to participate in research. The quality of data generated by convenience samples coming from Amazon's MTurk is as reliable as other popular methods (e.g., undergraduate populations) and often more representative of the general population in the United States (Buhrmester, Kwang, & Gosling, 2011). Participants were included in the study if they were 18 years old or older, resided in the United States, whose primary spoken language was English, and achieved a HIT approval rate on MTurk of $\geq 95\%$ with at least 500 completed HITs. Participants were compensated \$1.50 USD for participating in the study.

Measures

The Experiences in Close Relationships Form – Revised (ECR-R)

The ECR-R was used to measure the constructs of attachment avoidance and anxiety. The ECR-R is a reliable 36-item 7-point Likert scale (anchors: *strongly disagree* = 1 to *strongly agree* = 7) self-report measure of adult attachment that asks people about their behaviors in intimate relationships. It is composed of two 18-item factors—attachment avoidance and anxiety (Fraley, Waller, & Brennan, 2000). The ECR-R attachment avoidance and anxiety scores are computed by summing the total score for each factor and dividing them by 18 (number of items for each factor). The ECR-R was developed using item-response theory and possesses excellent psychometric properties. Prior research reports the internal consistency coefficients for avoidance and anxiety factors is .93 and .94, respectively (Sibley & Liu, 2004). Further, it appears to be the most robust self-report measurement of adult attachment across diverse samples (Graham & Unterschute, 2015). The internal consistency coefficients for the avoidance and anxiety factors in the current study are .96 and .97, respectively.

The Multidimensional Experiential Avoidance Questionnaire (MEAQ)

The MEAQ was used to measure the construct of functional avoidance. The MEAQ is a robust self-report measure that assesses a person's tendency to avoid certain experiences (e.g., thinking about painful emotions) using a 6-point Likert scale (anchors: *strongly disagree* = 1 to *strongly agree* = 6). The *Distraction/Suppression* (7 items) and *Repression/Denial* (12 items¹) MEAQ factors were used to measure functional avoidance, which reflects a person's tendency to avoid thoughts about undesirable emotional states and/or distressing experiences. These two factors have excellent internal consistency and test-retest reliability (Gámez et al., 2011). These

¹ One item from the MEAQ Repression/Denial factor was inadvertently omitted from the survey (“*People have told me that I’m not aware of my problems.*”).

two factors were combined to represent cognitive avoidance. The internal consistency reliability coefficients for the Distraction/Suppression factor, Repression/Denial factor, and combined scale were .87, .94 and .87, respectively in the current sample.

Patient Health Questionnaire (PHQ-8)

The PHQ-8 was used to measure the construct of depression. The PHQ-8 is an 8-item self-report measure of depression that assesses depressive symptoms based on the DSM-IV major depressive disorder criteria (Kroenke & Spitzer, 2002). It is scored using a 4-point frequency scale (anchors: *not at all* = 0 to *nearly every day* = 3). The internal consistency coefficient for the PHQ-8 in the current study is .91.

Trauma History Questionnaire (THQ)

The THQ was used to measure the construct of trauma. The THQ is a 24-item self-report measure of traumatic events and captures various traumatic life events a person may experience such as sexual violence and physical abuse (Green, 1996). It is constructed in a yes/no format and items are assigned a score of 1 for each item endorsed. The THQ is a reliable and valid self-report measure of trauma (Hooper et al., 2011). The internal consistency coefficient for the THQ in the current study is .82.

PTSD Check List for DSM-5 (PCL-5)

The PCL-5 was used to measure the construct of PTSD symptomology and severity. The PCL-5 is a 20-item clinical self-report measure of posttraumatic stress disorder based on the DSM-5 criteria. Respondents are asked to indicate their response using a 5-point scale (anchors: *not at all* = 0 to *extremely* = 4). It has excellent internal consistency (e.g., .94) and test-retest reliability (e.g., .82) and its factor structure maps well onto the four major PTSD criteria in the

DMS-5 (Blevins et al., 2015). The internal consistency coefficient for the PCL-5 in the current study is .96.

Autobiographical Memory Test (AMT)

The AMT was used to measure the construct of overgeneral memory. The AMT is a word cue memory task containing 5 positive and 5 negative word cues. Participants are asked to recall a specific memory from their past in response to each word cue. For the present study, four² positive (affection, comfort[ed], embrace[d], and trust[ed]) and five negative (abandon[ed], hurt, insecure, lonely, and reject[ed]) attachment-related words were used for the AMT. These words were chosen from Edelstein and Gillath (2008) who compiled and rated lists of positive and negative attachment-related words. Importantly, Edelstein and Gillath (2008) found that positive and negative attachment-related words were significantly relevant to the attachment construct more than a set of general positive and negative emotional words. A modified version of the minimal instructions AMT procedure developed by Debeer et al. (2009) was used (e.g., “*Can you write down [a personal] event that the word _____ reminds you of?*”). Participants were given as much time as they needed to type their responses to each cue.

The scoring procedure used in the current study was adapted from Williams (2005). Memories that contained reference to a specific time lasting less than 24-hours were coded as specific (e.g., the day my daughter was born). Memories that referenced a time period lasting long than 24-hours were coded as extended (e.g., when I was in college). Memories that summarized reoccurring events were coded as categoric (e.g., driving home from work every day). Memories that simply referred to another semantic category were coded as a semantic

² Although 5 positive cues words were used, only 4 (affection, comforted, embraced, and trusted) were used during analyses because half of the participants inadvertently received the cue ‘loving’ instead of ‘loved.’

associate (e.g., my dog). Finally, memories that were repeated or left omitted were coded as an omission (i.e., no response). Additional adaptations were made to this scoring protocol while two raters coded a separate sample of memories from the AMT prior to the current study.

Specifically, raters assigned only one memory code for each ATM item. In the event that a respondent provided more than one memory in response to an AMT cue or multiple iterations of the same memory, raters assigned only one code that captured the highest form of retrieval.

According to the AMT Consensus Meeting (see Raes et al., 2007, footnote 2), specific memories are regarded as the highest level of autobiographical memory retrieval followed by extended, categoric, and finally semantic associates. Thus, if a respondent first retrieved a semantic associate and then through elaboration generated a specific autobiographical memory, the rater coded the memory as specific.

The Attentive Responding Scale (ARS-18)

The ARS-18 was used to identify unreliable responses. The ARS-18 captures inconsistent responding with 6 item pairs (12 items total) that tap the same content (e.g., “I am an active person” and “I have an active lifestyle”) and infrequent responding to 6 items that are generally not endorsed due to their content (e.g., “I’d rather be hated than loved”) when people are reading items closely (Mainiaci & Rogge, 2014). The ARS-18 has been found to reliably detect inattentive online survey responding and increase statistical power (Mainiaci & Rogge, 2014).

Table 1 contains a list of the measures used in the current study and the constructs they measure.

Table 1. Study Measures and Associated Constructs

Measure	Construct
Experiences in Close Relationships – Revised (ECR-R)	Attachment Avoidance (ECR-R-Av) Attachment Anxiety (ECR-R-Ax)
Patient Health Questionnaire (PHQ-8)	Depression Severity
Trauma History Questionnaire (THQ)	Trauma Exposure
PTSD Check List for DSM-5 (PCL-5)	PTSD Severity
The Multidimensional Experiential Avoidance Questionnaire (MEAQ)	Cognitive Avoidance

Procedure

Prior to data collection, a pilot study was conducted to test the feasibility of the current study. Results from the pilot study indicated that the current methodology was feasible and produced reliable data.

Participants provided voluntary informed consent to participate in the study before any research procedures were performed. Participants completed the AMT first. The presentation order of the AMT cues alternated between positive and negative cues and were counterbalanced using a 10x10 Latin-square design for each participant. The counterbalanced conditions were randomly presented to participants using Qualtrics' embedded randomization Survey Flow feature. After completing the AMT items, participants completed 9 items from the ARS-18 (the first 6 inconsistency items and 3 infrequency items). Participants then completed the demographic, attachment, mood, trauma, and other personality questionnaires in a random order using Qualtrics' embedded randomization Survey Flow feature. Finally, participants completed the last 9 items from the ARS-18 (the last 6 inconsistency items and 3 infrequency items). The presentation order of the ECR-R and ARS-18 items were presented in a random order to each participant. Participants were compensated \$1.50 USD for their participation. See appendix for all the measures used in the current study.

Data Analysis

Pearson correlation coefficients were used to examine the first hypothesis. The Hays PROCESS (version 3.5) SPSS algorithm was used to examine the second hypothesis that attachment avoidance will moderate (i.e., magnify) the relationship between cognitive avoidance and OGM when attachment avoidance is high. The Hayes Process algorithm uses an ordinal least

squares regression while treating the effect of X (independent variable: cognitive avoidance) on Y (dependent variable: proportion of categoric memories) as a linear function of W (moderating variable: attachment avoidance). For the third hypothesis, a 3-step hierarchical regression was used to examine the percentage of variance in OGM explained by the hypothesized magnifying effect of attachment avoidance on the relationship between cognitive avoidance and OGM, and whether other known predictors of OGM including trauma exposure, PTSD, and depression would significantly add additional explained variance above and beyond that of the former variables. In step 1, cognitive avoidance and attachment avoidance were entered into the model followed by the interaction term between cognitive avoidance and attachment avoidance in step 2, and finally the trauma exposure, PTSD, and depression variables in step 3. The rationale for entering the variables in this manner is threefold: first, evidence exists that the internal working models underlying attachment avoidance are forged in early childhood and go on to serve as default mental representations of the world and self in adulthood (Fraley, 2002; Fraley & Brumbaugh, 2004); second, the internal working models of attachment avoidance presumably facilitate behaviors consistent with cognitive avoidance; and third, depression and PTSD are more likely to appear after the development of attachment avoidance and in conjunction with trauma exposure. Entering the regression variables in this manner would satisfy Cohen and Cohen's (1983) guidelines regarding the causal priority of predictor variables in hierarchical regression.

Results

Data were collected from February 13, 2020 to February 21, 2020. Four hundred and eighty-seven people completed the study. One hundred and fifty-one (31%) participants' data were deemed unreliable and excluded from analyses per established cutoff scores on the ARS-18

inconsistency and infrequency items. Data from 5 participants were excluded because English was not their primary spoken language and another participant did not generate any memories, leaving the final sample size at 330.

AMT Interrater Reliability

The primary investigator and a research assistant blinded to the purpose of the study coded participants' AMT responses. The raters practiced coding AMT memories using a different dataset prior to coding AMT memories from the current sample. After several practice sessions, interrater reliability for the current sample was established in two waves. In the first wave, raters coded 500 overlapping memories taken from the first half of the sample ($k = .77$). Raters then coded another 510 overlapping memories taken from the second half of the sample ($k = .71$). Discrepancies were resolved by alternating between each rater's code. Together, the raters coded 1,010 overlapping memories (30% of the sample) and achieved *moderate* agreement, $k = .74$ (McHugh, 2012).

Descriptive Statistics

Demographic information related to age, education, gender identity, race, household income, and relationship status are reported in table 2. Participants' ages ranged from 19 to 72 years old ($M = 40.9$, $SD = 12.1$) and years of education ranged from 4 to 25 years ($M = 15.5$, $SD = 2.8$). One hundred and eighty-three participants (55.5%) identified as female. One participant (0.3%) identified as an Alaska Native or American Indian, 22 (6.7%) identified as Asian, 36 (10.9%) identified as Black or African American, 17 (5.2%) identified as Hispanic, Latino, or Spanish Origin, one (0.3%) identified as Native Hawaiian or Other Pacific Islander, 250 (75.8%) identified as White, and three (0.9%) identified as Other. Thirty participants (9%) reported a total household income of \leq \$19,000, 72 (21.8%) reported a total household income between \$20,000

and \$39,000, 70 (21.2%) reported a total household income between \$40,000 and \$59,000, 62 (18.8%) reported a total household income between \$60,000 and \$79,000, 37 (11.1%) reported a total household income between \$80,000 and \$99,000, and 60 (18.1%) reported a total household income of \$100,000 or more. Two hundred forty-seven participants (74.6%) reported being in a romantic relationship.

Table 2. *Sample Demographics*

Age	40.9 (12.1)
Education	15.5 (2.8)
Gender Identity (%)	
Female	55.5
Male	45.5
Ethnicity (%)	
Alaska Native or American Indian	0.3
Asian	6.7
Black or African American	10.9
Hispanic, Latino, or Spanish Origin	5.2
Native Hawaiian or Other Pacific Islander	0.3
White	75.8
Other	0.9
Income (%)	
≤ \$19,000	9.0
\$20,000 to \$39,000	21.8
\$40,000 to \$59,000	21.2
\$60,000 to \$79,000	18.8
\$80,000 and \$99,000	11.1
≥ \$100,000	18.1
% In a romantic relationship	74.6

Descriptive statistics for participants' AMT performance are reported in table 3.

Participants generated the largest proportion of specific memories ($M = .49$, $SD = .26$), followed by categoric ($M = .26$, $SD = .24$), extended ($M = .20$, $SD = .15$), and semantic ($M = .05$, $SD = .11$).

Table 3. *Descriptive statistics for the Autobiographical Memory Test.*

All Cues	Mean ^a (SD)	Median	Range
Proportion Specific	.49 (.26)	.50	0-1.0

Proportion Extended	.20 (.15)	.22	0-.88
Proportion Categorical	.26 (.24)	.22	0-1.0
Proportion Semantic	.05 (.11)	.00	0-.57
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Negative Cues			
Proportion Specific	.52 (.29)	.50	0-1.0
Proportion Extended	.23 (.20)	.20	0-.80
Proportion Categorical	.22 (.27)	.20	0-1.0
Proportion Semantic	.03 (.09)	.00	0-.50
<hr/>			
Positive Cues			
Proportion Specific	.45 (.33)	.50	0-1.0
Proportion Extended	.16 (.19)	.00	0-1.0
Proportion Categorical	.31 (.30)	.25	0-1.0
Proportion Semantic	.09 (.19)	.00	0-1.0

Note. ^a The sum of the means for each group (e.g., all cues, negative cues, and positive cues) may be greater than 1 due to rounding.

The same pattern was found for the AMT positive cues: specific memories ($M = .45$, $SD = .33$), by categorical memories ($M = .31$, $SD = .30$), extended memories ($M = .16$, $SD = .19$), and semantic memories ($M = .09$, $SD = .19$), whereas the pattern for AMT negative cues was as follows: specific memories ($M = .52$, $SD = .29$), extended memories ($M = .23$, $SD = .20$), categorical memories ($M = .22$, $SD = .27$), and semantic memories ($M = .03$, $SD = .09$).

Descriptive statistics for mood, trauma, and experiential avoidance variables are reported in table 4. The sample mean for depressive symptoms per the PHQ-8 was 5.6 ($SD = 5.6$) and fell below the established cutoff of ≥ 10 for a screening diagnosis of major depressive episode. The sample mean for PTSD symptomology per the PCL-5 was 17.2 ($SD = 17.5$) and fell below the established cutoff scores used for establishing a preliminary diagnosis of PTSD with 65 participants (19.7%) meeting criteria for probable PTSD per the PCL-5 conservative cutoff score of ≥ 33 , which is higher than previous reports (e.g., 4% of the general population; Briere, Agee, & Dietrich, 2016). The sample mean for traumatic life events was 4.9 ($SD = 4.0$) with 301 participants (91.2%) reporting at least one traumatic life event. The sample mean for attachment anxiety and avoidance per the ECR was 3.0 ($SD = 1.6$) and 2.9 ($SD = 1.3$), respectively and

comparable to prior research. Finally, the sample mean for experiential avoidance per the MEAQ was 54.7 ($SD = 13.0$).

Table 4. *Descriptive statistics for the mood, trauma, and experiential avoidance variables.*

	Mean (SD)	Median	Range
AMT ^a Total Words	298.1 (223.1)	235.0	0-1606
MEAQ ^b	54.7 (13.0)	54.0	18-94
PCL-5 ^c	17.2 (17.7)	12.0	0-80
THQ ^d	4.9 (4.0)	4.0	0-20
PHQ-8 ^e	5.6 (5.6)	4.0	0-24
ECR ^f			
Anxiety	3.0 (1.6)	2.7	1-6.89
Avoidance	2.9 (1.3)	2.7	1-6.72

^a AMT = Autobiographical Memory Test; ^b MEAQ = Measure of Experiential Avoidance Questionnaire; ^c PTSD Checklist for DSM-5; ^d THQ = Trauma History Questionnaire; ^e PHQ-8 = Patient Health Questionnaire; ^f ECR = Experiences in Close Relationships

Correlation between Cognitive Avoidance and Overgeneral Memory

Table 5 contains the Pearson correlation coefficients between the key variables of interest in the current study and each of the AMT variables. Cognitive avoidance measured by the MEAQ was positively correlated with OGM (i.e., proportion of categoric memories) $r(331) = .12$, $p = .03$, indicating that greater levels of self-reported experiential avoidance was associated with more categoric memories on the AMT. In contrast, a significant negative correlation was found between cognitive avoidance and the proportion of specific memories, $r(331) = -.11$, $p = .046$.

Table 5. *Pearson correlation coefficients between attachment, clinical, and coping variables and the AMT variables.*

	Specific	Extended	Categoric	Semantic
ECR-Ax ^a	-.04	.11*	.00	-.07
ECR-Av ^b	-.08	.08	.03	.01
MEAQ	-.11*	.04	.12*	-.05
THQ	.07	.01	-.09	.00
PCL-5	-.07	.08	.07	-.08
PHQ-8	-.11	.08	.08	-.03

Note. $N = 330$. * $p < .05$; ** $p < .01$. ^a ECR-Ax = ECR-Anxiety; ^b ECR-Av = ECR-Avoidance.

Moderation Analyses

To test the hypothesis that attachment avoidance, as measured by the ECR, moderated the relationship between experiential avoidance and OGM when attachment avoidance is high, attachment avoidance was examined as a continuous moderator of the relationship between cognitive avoidance and OGM using the Hays PROCESS (version 3.5) SPSS algorithm. The Hayes Process algorithm uses an ordinal least squares regression while treating the effect of X (independent variable) on Y (dependent variable) as a linear function of W (moderating variable). For the analysis, cognitive avoidance served as the independent variable and the proportion of censored memories served as the dependent variable while attachment avoidance served as the moderator variable. Attachment avoidance and MEAQ scores were centered prior to the analysis. No significant moderation effect was observed, $R^2 = .012$, $F(3, 326) = 1.31$, $p = .27$. Thus, the relationship between cognitive avoidance and OGM did not vary as a function of attachment avoidance.

Hierarchical Linear Regression

Zero-order Correlations

Consistent with prior research (Romero et al., 2020), self-reported cognitive avoidance was positively correlated with self-reported attachment avoidance $r(331) = .46$ $p < .001$ (see table 6). Cognitive avoidance, attachment avoidance, trauma exposure, PTSD, and depression were all positively correlated with each other. This finding is consistent with previous research illustrating how cognitive avoidance is a core behavioral feature in trauma survivors and people experiencing PTSD and depression (Briere et al., 2010; Paunovic, 1998; Williams & Moulds, 2007). Contrary to previous research, trauma exposure, PTSD, and depression were not correlated with OGM.

Table 6. Hierarchical regression correlation matrix

	1	2	3	4	5	6	7
1. Proportion Categorical	1						
2. MEAQ	.12*	1					
3. ECR-Avoidance	.03	.46**	1				
4. ECR-Av x MEAQ	-.01	.15**	.18**	1			
5. THQ	-.08	.17**	.16**	.01	1		
6. PCL-5	.07	.41**	.40**	.08	.39**	1	
7. PHQ-8	.08	.38**	.36**	.06	.34**	.79**	1

Note. $N = 330$. * $p < .05$; ** $p = < .01$

Regression Results

Results from the regression model are reported in table 7. In step 1 of the hierarchical regression model, cognitive avoidance significantly predicted OGM, $b = .002$, $t(327) = 2.158$, $p = .032$, however the variance explained by cognitive avoidance and attachment avoidance in step 1 was not significant, $R^2 = .015$, $F = 2.474$ (2, 327), $p = .09$. Thus, cognitive avoidance and attachment avoidance did not significantly explain any variance in OGM in the current sample. At step 2, the variance explained by the defensive exclusion model interaction term (cognitive avoidance x attachment avoidance) was not significant [$R^2 = .015$, $F = 1.689$ (1, 326), $p = .17$], nor was the change in R^2 between step 1 and 2, $\Delta R^2 = .000$, $\Delta F = .131$, $p = .71$. At step 3, trauma exposure significantly predicted OGM, $b = -.008$, $t(323) = -2.325$, $p = .021$, however the variance explained by the clinical variables entered in step 3 (trauma exposure, PTSD, and depression) was not significant [$R^2 = .033$, $F = 1.859$ (3, 323), $p = .09$], nor was the change in R^2 between steps 2 and 3, $\Delta R^2 = .018$, $\Delta F = .112$, $p = .11$. Although cognitive avoidance significantly predicted OGM in step 1, its effect was no longer significant after entering the clinical variables in step 3.

Multicollinearity was not found to be an issue among the predictor variables as evidence by the fact that tolerance was $> .20$ and the VIF was less than 3 for all variables in the model.

Table 7. Hierarchical Multiple Regression Results, Standardized Coefficients (N = 330).

Variable	b	β	t	Tolerance	VIF	R	R ²	R ² _{Adj}	F	ΔR^2	ΔF
Step 1 – Defensive Exclusion Variables		-	-	-	-	.122	.015	.009	2.474	.015	2.474
1. Cognitive Avoidance (MEAQ)	.002	.133	2.158*	.793	1.261						
2. Attachment Anxiety (ECR-Av)	-.006	-.031	-.501	.793	1.261						
Step 2 – Defensive Exclusion Model Interaction		-	-	-	-	.124	.015	.006	1.689	.000	.131
3. Cognitive Avoidance x Attachment Avoidance	.000	.001	-.363	.961	1.041						
Step 3 – Clinical Variables		-	-	-	-	.183	.033	.015	1.859	.018	2.014
4. Trauma Exposure (THQ)	-.008	-.138	-2.325*	.847	1.180						
5. PTSD Symptoms (PCL-5)	.000	.030	.319	.337	2.969						
6. Depression Symptoms (PHQ-8)	.003	.070	.773	.367	2.727						

Note. * $p < .05$. All values are for the step in which the variables were entered.

Exploratory Analyses

Several exploratory analyses were carried out to examine the contributions of other potentially relevant variables for explaining the presence of OGM.

Cue Valence

Two additional moderation analyses were conducted to examine whether the relationship between cognitive avoidance and OGM varies as a function of attachment avoidance depending on AMT cue valence. These exploratory analyses were carried out because prior research indicates that cue-valence is associated with different outcomes on the AMT and that these differences vary by clinical features (e.g., trauma and depression and PTSD symptomology; Ono et al., 2016). Additionally, attachment styles have been associated with memory functioning depending on the valence of target stimuli (Edelstein, 2006; Mikulincer & Orbach, 1995; Preg & Mikulincer, 2004). The analyses were identical to the previous moderation analysis with the exception of the dependent variables, which were the proportion of categoric memories for positive and negative cues, respectively. No significant moderation effect was observed for positive, $R^2 = .010$, $F(3, 325) = 1.06$, $p = .36$ or negative AMT cues, $R^2 = .015$, $F(3, 324) = 1.60$, $p = .19$. Therefore, the relationship between cognitive avoidance and OGM does not fluctuate as a function of attachment avoidance regardless of cue valence.

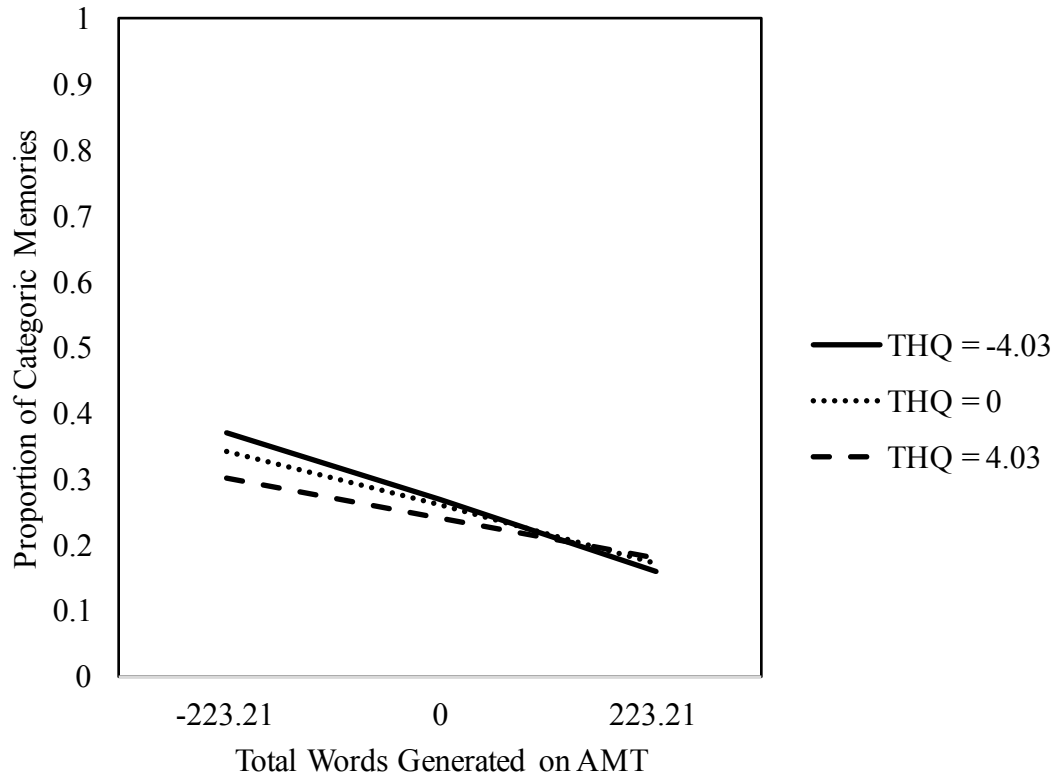
Words Generated on the AMT

Because previous research suggests that using an untimed version of the AMT may allow people with a history of trauma to be more self-reflective and expressive in their responses (Bunnell & Greenhoot, 2012), additional analyses were conducted looking specifically at the number of words generated on the AMT. It is presumed that the number of words a person generates on the AMT is an indicator of self-reflective elaboration.

Moderation Analysis. The total number of words generated on the AMT was significantly correlated with OGM (i.e., the proportion of categoric memories; $r(331) = -.30, p < .01$, and trauma exposure $r(331) = .19, p < .01$. To tease apart these zero-order correlations, a moderation analysis was carried out to examine if the relationship between the number of words generated on the AMT and OGM is moderated by trauma exposure.

Using the Hays PROCESS (version 3.5) SPSS algorithm, the proportion of categoric memories served as the dependent variable. The total number of words generated on the AMT was entered as the predictor variable, and trauma exposure was entered as the moderating variable. These variables were mean centered prior to the analysis. Results from the moderation analysis revealed that trauma exposure significantly moderated the relationship between total words generated on the AMT and OGM, $R^2 = .11, F(3, 326) = 12.771, p < .01$. Analyses of the simple slopes show that for low trauma exposure, every word written results in a .0005 reduction in the proportion of categoric memories, $t(326) = -5.297, p < .001, b = -.0005$. For average trauma exposure, every word written results in a .0004 reduction in the proportion of categoric memories, $t(326) = -5.965, p < .001, b = -.0004$. For high trauma exposure, every word written results in a .0003 reduction in the proportion of categoric memories, $t(326) = -4.276, p < .001, b = -.0003$ (see figure 1). In sum, the data reveal that the effect of writing more about past personal experiences on OGM becomes less negative with increasing trauma exposure.

Figure 1. Exploratory Moderation Analysis



Discussion

For decades, researchers have observed that people experiencing depression, PTSD, and trauma often retrieve overgeneral autobiographical memories (Barry et al., 2018; Ono et al., 2016; Sumner et al., 2010; Vreeswijk & Wilde, 2003). The most cited explanation of the overgeneral memory (OGM) phenomenon is the affect-regulation theory of functional avoidance. This theory asserts that OGM is the manifestation of avoidant coping strategies employed during memory retrieval, especially when recalling past negative events. These strategies help minimize psychological distress by filtering out episodic details attached to past negative experiences. Although offering important insights about the nature of OGM, the construct of functional avoidance overlaps with another emotion-coping construct in attachment theory—defensive exclusion.

Attachment theory asserts that defensive exclusion—the notion that people implicitly block either the encoding or retrieval of episodic details associated with negative life events—is a maladaptive coping mechanism that reflects a person’s internal working models of the world and self. The internal working models underlying defensive exclusion develop through interpersonal transactions early in life. Importantly, defensive exclusion is a hallmark feature of people who develop an avoidant attachment style that is characterized by inhibited emotional responses in situations that typically evoke strong emotions and disinterest in maintaining or reestablishing emotionally close relationships with others. Moreover, research indicates that people exhibiting an avoidant attachment style tend to (a) direct attention away from words that signal threat to the attachment system during information processing (Dewitte et al., 2006); (b) take longer to retrieve negative memories with attachment themes (Mikulincer & Orbach, 1995); (c) have diminished access to positive and negative memories following mood inductions (Pereg & Mikulincer, 2004); (d) recall fewer details of documented childhood sexual trauma (Edelstein et al., 2005); and (e) have poorer recall of positive and negative autobiographical event characteristics (Öner & Gülgöz, 2016). Thus, it appears that attachment avoidance is associated with disruptions in memory performance.

Based on available evidence, the current study asserts that internal working models can dictate the flow of incoming information during memory encoding, which will influence whether new experience is successfully transferred to long-term memory. It is presumed that people exhibiting higher levels of attachment avoidance are more likely to block details associated with new interpersonal experiences that evoke the attachment system from being successfully encoded into long-term memory. As a result, the formation of coherent autobiographical memories for attachment-related events is likely to be less specific and overgeneral.

The purpose of the current study was to investigate whether defensive exclusion would account for the presence of OGM over and above functional avoidance. The following three hypotheses were examined: (1) cognitive avoidance would be positively correlated with the proportion of categoric (i.e., overgeneral) memories on the autobiographical memory test (AMT); (2) attachment avoidance would magnify the effect of cognitive avoidance on OGM when attachment avoidance is high; and (3) the magnifying effect of attachment avoidance on the relationship between cognitive avoidance and OGM would predict a significant amount of variance in OGM. Lastly, additional analyses were carried out to examine whether adding clinical variables that are strongly correlated with OGM (e.g., depression, PTSD, and trauma exposure) would add additional explained variance to OGM above and beyond the interaction between cognitive avoidance and attachment avoidance.

Cognitive Avoidance and Overgeneral Memory

Consistent with the first hypothesis, cognitive avoidance was positively correlated with the proportion of categoric memories on the AMT. Conversely, higher cognitive avoidance was associated with the presence of fewer specific memories on the AMT. Together, these correlations fit with prior research documenting that coping styles characterized by avoidance, particularly emotion suppression and repression, are associated with OGM (Beatrijs et al., 2006; Debeer et al., 2012; Romero et al., 2020).

Defensive Exclusion and Overgeneral Memory

Contrary to the second hypothesis, attachment avoidance did not moderate the relationship between cognitive avoidance and OGM. This indicates that attachment avoidance did not exert any unique influence on the relationship between cognitive avoidance and OGM.

This finding does not support recent accounts implicating the internal working models of attachment avoidance in OGM (e.g., Cao et al., 2018; Conway, 2005).

One possible explanation is that the untimed nature of the AMT task may have encouraged elaboration and allowed people to retrieve more episodic details about each memory (see below). Giving people more time to reflect upon and reconstruct past events may have allowed those with more avoidant attachment styles to override defensive strategies that presumably block the retrieval of episodic information. Another explanation is that the memory cues used in this study failed to activate participants' attachment systems. Recent research investigating the relationship between adult attachment styles and autobiographical memory specificity found that priming people with a secure attachment style was related to *more* specific and *less* categoric autobiographical memories compared to people who underwent a neutral attachment prime (Bryant & Bali, 2018). Thus, the defensive strategies inherent to attachment avoidance may only take effect when the attachment system is sufficiently activated.

Trauma History, PTSD, and Depression

Multiple meta-analyses have found strong effect sizes for the relationships between OGM and trauma history, PTSD, and depression using the AMT (Barry et al., 2018; Ono et al., 2016; van Vreeswijk & de Wilde, 2003). The current study did not replicate these findings. None of the variables--trauma exposure, PTSD, or depression--was associated with the proportion of categoric memories or any other memory type on the AMT. This is striking given the strong support in the literature for the relationship between these clinical variables and OGM using the AMT. Nevertheless, these findings are consistent with a handful of studies finding no relationship between depression or PTSD and OGM (Hermans et al., 2004; Kleim et al., 2013).

Trauma Exposure, Elaboration, and OGM

Although no significant correlations were found among any of the key clinical variables and the proportion of categoric memories, exploratory analyses revealed that trauma history was associated with the number of words generated on the AMT. Specifically, as self-reported traumatic exposure increased, participants elaborated more on their personal experiences as evidenced by the increase in the number of words people wrote on the AMT. This finding is consistent with prior research showing that people with trauma histories tend to generate longer trauma narratives (Beaudreau, 2007; Jelinek et al., 2009; Lindblom & Gray, 2010; Römisch et al. 2014). One explanation for this finding is that writing more, especially for those who have experienced trauma, might be adaptive coping behavior that facilitates psychological adjustment (Crespo et al. 2016). Supporting this proposition, a significant negative correlation was found between the number of words generated on the AMT and the proportion of categoric memories. Thus, writing more may promote *generative* (i.e., multiple elaborations of autobiographical knowledge), rather than *direct* (i.e., a truncated search of autobiographical knowledge), retrieval and subsequent recall of episodic memories that minimize overgeneral remembering, with the latter being strongly associated with PTSD and depression (Ono et al., 2016).

Interestingly, the data suggest that writing more about past personal experiences may be an adaptive coping strategy for people with minimal trauma exposure. Additional exploratory analyses revealed that trauma exposure moderated the relationship between the number of words generated on the AMT and OGM. Specifically, writing less on the AMT was related to more OGM among those reporting minimal trauma exposure compared to people reporting greater trauma exposure. However, this relationship flipped as people wrote more on the AMT such that writing more was associated more OGM in people reporting greater trauma exposure compared to those reporting minimal trauma exposure. Furthermore, the data show that the effect of writing

more about past personal experiences on OGM becomes less negative with increasing trauma exposure. A plausible explanation is that these data indicate that people with extensive trauma histories may have greater difficulty accessing episodic memories attached to past personal experiences. This finding is consistent with previous research indicating that trauma exposure is strongly correlated with OGM (Barry et al., 2018).

One possible explanation for why those experiencing more traumatic life events generated more categoric memories despite writing longer narratives on the AMT may be due to diminished cognitive control during memory retrieval. For example, Williams et al. (2007) assert that higher cognitive resources are needed to carry out effective searches for episodic details when a particular memory is being retrieved from long-term memory. These executive resources help inhibit the retrieval of irrelevant information during the search process that might cause interference. Consistent with this proposal, Dalgleish et al. (2008) found that individuals with poor inhibitory control generated more overgeneral memories on the AMT. Although Dalgleish et al.'s (2008) findings are specific to those experiencing elevated symptoms of depression, research indicates that poor inhibitory control is observed among trauma survivors (Marshall et al., 2016). Thus, it is possible that the individuals in this study who reported greater trauma and wrote more about their past experiences generated more categoric memories because they were unable to either (a) locate specific episodic details in long-term memory or (b) ward off competing intrusive thoughts elicited by the ATM cues.

Alternatively, it is possible that people who have experienced greater trauma have a harder time encoding new information, which could lead these individuals to remember past experiences in an overgeneral manner regardless of their attempts to elaborate on memory cues. Consistent with this idea, research shows that trauma exposure is associated with impaired

working memory performance in adults and children (DePrince, Weinzierl, & Combs, 2009; El-Hage, Gaillard, Isingrini, & Belzung, 2006; Majer et al., 2010). Research also shows that trauma exposure is associated with other health problems that contribute to chronic stress (D'Andrea et al., 2011) and that chronic stress is associated with impaired memory performance when attention is disrupted during memory encoding (Öhman et al., 2007). Thus, it is possible that trauma exposure impairs the encoding of new information and this increases the likelihood that general, rather than specific, events will be recalled when people experience high trauma exposure.

The finding that writing more on the AMT is related to fewer OGMs may reflect that people engaged in a form of generative retrieval that allowed them to access episodic memories after multiple elaborations on general events and lifetime periods that naturally come to mind in response to cue words. Such an interpretation is consistent with previous research. For example, Hallford et al. (2020) found that the number of episodic details contained within autobiographical memories on the AMT was positively correlated with the proportion of specific memories. They also found that categoric memories contained fewer episodic details than specific memories. Further, Kyung et al. (2016) found that the number of episodic details was strongly correlated with the length of written AMT memories. Although the current study did not examine the detailedness of AMT memories, the number of words participants generated on the AMT may be indicative of detailedness, which could explain why the number of words generated on the AMT was negatively correlated with the proportion of categoric memories.

Possible Confounds

It is worth noting that the methodology related to the AMT used in the current study may have influenced memory recall. Prior research investigating the influence of different AMT

elicitation methods have found notable differences between timed and untimed versions of the AMT (Bunnell et al., 2018; Bunnell & Greenhoot, 2012; van Vreeswijk & De Wilde, 2004). For example, van Vreeswijk and De Wilde (2004) found that the amount of time participants are given to respond to AMT cues moderated AMT performance. Bunnell and Greenhoot (2012) also found that varying the time participants were given to respond to AMT cues resulted in different outcomes that either confirmed or contradicted prior research. For instance, they found that childhood abuse severity was positively correlated with the proportion of specific memories on the AMT when participants were given an untimed version of the AMT, whereas childhood abuse severity was negatively correlated with specific memories when another group completed a timed version of the AMT. According to Bunnell and Greenhoot (2012), the timed version of the AMT may represent a cognitively demanding task that consumes more cognitive resources that facilitate functional avoidance among those who have experienced traumatic life events, whereas an untimed AMT may allow people to use more cognitive resources to override an avoidant coping strategy during memory retrieval. Therefore, it is possible that the untimed nature of the AMT used in the current study allowed participants with trauma histories as well as PTSD and depression symptoms to be more reflective when retrieving and writing autobiographical memories enabling them to recall more episodic details of past events.

Additional research has shown that asking people to respond to AMT cues with either written or verbal modalities also influences AMT performance. For example, Bunnell, Legerski, and Herting (2018) found that the AMT face-to-face oral interview, the most commonly used elicitation method, was associated with fewer specific memories and more categoric and extended memories compared to a hand-written and typing AMT method. The authors suggest that the anonymity of the hand-written and typing conditions may have encouraged participants

to engage in more elaboration and generative retrieval during memory recall. Interestingly, Bunnell et al. (2018) only gave participants two minutes to write or type their responses. Given that the current study afforded participants the same level of anonymity and required them to type their responses on an untimed version of the AMT, the results may be a product of study methodology (i.e., retrieval context). Future autobiographical memory research using the AMT should consider the impact of different elicitation methods (e.g., varying the amount of time to write or given an oral response) and more experimental studies should be carried out to examine the utility of various theories attempting to explain the presence of OGM using different AMT methods.

The present study used cues that have been previously used to elicit internal working models of attachment figures. To our knowledge, this is the first time a set of attachment-specific cue words have been used on the AMT. Prior research indicates that cue words on the AMT can influence whether people retrieve OGMs (Hauer et al., 2008; Williams et al., 1996). For example, Hauer et al. (2008) found that using words that are more concrete, imaginable, and likely to elicit personal memories compared to the standard AMT cue words eliminated the presence of OGM in a sample of people reporting childhood sexual abuse. Additionally, Anderson, Dewhurst, and Dean (2017) showed that cues high and low in imaginability differentially affect autobiographical memory retrieval such that low, as compared to high, imaginability cues significantly reduced the retrieval of specific autobiographical memories. Further, Harris and Berntsen (2019) found that cue words that are concrete, high on imaginability, and personally relevant were associated with direct retrieval more so than cue words that were abstract and low on imaginability. The authors also found that people provided more specific autobiographical memories during generative retrieval compared to direct

retrieval. Thus, it is possible that the cue words in the current study were qualitatively different from the standard AMT cues and may have encouraged more generative retrieval among participants and consequently more specific memories. Future research using different cue words should assess the qualitative aspects of each word compared to the standard words to rule this effect out. For example, it would be worthwhile to assess whether attachment-related cues differ in imaginability and concreteness from the standard ATM cues.

Another potential confound in the current study relates to the sample's characteristics. The clinical makeup of the current sample does not reflect the general population with regard to PTSD symptomology. For example, 19% of the sample met criteria for a probable diagnosis of PTSD, rates that exceed what is typically seen in the general population. Given the current consensus in the literature, such a sample should have generated more categoric overgeneral memories. But as noted earlier, the untimed AMT used in this study may explain why the sample generated more specific memories than any other memory type. On the other hand, the high rates of PTSD in the current sample may have contributed to the recall of specific memories. Evidence from retrieval-induced suppression studies show that individuals who have experienced trauma and meet criteria for PTSD tend to remember *more* to-be-forgotten information compared to those who do not meet criteria for PTSD (Zwissler et al., 2011). It is well documented that PTSD is associated with deficits in inhibitory control (Aupperle et al., 2012) and that inhibitory control plays a key role in filtering out goal-irrelevant information from working memory in people with PTSD (Eren-Koçak et al., 2009; Schweizer & Dalgleish, 2011). Failing to forget information that one wishes to exclude from conscious awareness may reflect poor inhibitory control, and in the context of PTSD it may be particularly difficult to inhibit specific episodic details from entering working memory during memory retrieval. Therefore, it is possible that the current sample,

characterized by substantial trauma and PTSD symptoms, could not inhibit the retrieval of specific episodic details, which led to remembering fewer categoric memories. However, this is not supported by the data since PTSD symptoms were unrelated to the proportion of specific and categoric memories on the AMT. This suggests that the untimed nature of the AMT likely had a significant impact on participants AMT responses that may have washed out the effects of other key clinical variables.

Strengths

The current study has several notable strengths. First, the current study is the first to examine Bowlby's defensive exclusion hypothesis in the context of autobiographical memory. Second, the significant positive correlation found between the MEAQ and the proportion of categoric memories corroborates previous research and adds additional support to the literature that features of emotion suppression and repression are correlated with OGM, even on an untimed AMT. Third, a large sample size was obtained from a more diverse and representative population of people compared to other studies in the AMT literature, which typically rely on young adult college populations.

Limitations

The current study has several notable limitations. Although accounting for many relevant variables known to be related to OGM, this study did not account for individual differences in general cognitive ability. There is evidence that general intelligence is associated with OGM. For example, Park et al. (2002) found that general intelligence was negatively correlated with categoric memories on the AMT in both depressed patients and health controls. Other variables known to be associated with OGM are executive functioning and rumination. There is growing evidence that OGM develops as a result of three mechanisms: rumination, functional avoidance,

and deficient executive functioning (Williams et al., 2007). Future research investigating the relationship between attachment styles and OGM should control for rumination and executive functioning given that these variables have been associated with OGM.

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Appendix

Demographic Questions

What is your age?

How many years of school have you completed?

What is your gender identity?

Female

Male

Other (please specify):

What is your primary spoken language?

Arabic

Chinese

English

French

Japanese

Korean

Spanish

Tagalog

Vietnamese

Other (please specify):

Which category best describes you?

Alaskan Native or American Indian

Asian

Black or African American

Hispanic, Latino, or Spanish Origin

Middle Eastern or North African

Native Hawaiian or Other Pacific Islander

White

Other (please specify):

Are you currently in a romantic relationship?

Yes

No

Please indicate your total household income:

Less than \$10,000

\$10,000 - \$19,000

\$20,000 - \$29,999

\$30,000 - \$39,999

\$40,000 - \$49,999

\$50,000 - \$59,999

\$60,000 - \$69,999
\$70,000 - \$79,999
\$80,000 - \$89,999
\$90,000 - \$99,999
\$100,000 - \$149,999
More than \$150,000

Experiences in Close Relationships, Revised (ECR-R)

ECR-R: Attachment Anxiety Items

The statements below concern how you feel in emotionally intimate relationships. Respond to each statement by indicating how much you agree or disagree with the statements.

I'm afraid that I will lose my partner's love.

Strongly disagree - 1

Disagree - 2

Somewhat disagree - 3

Neither agree nor disagree - 4

Somewhat agree - 5

Agree - 6

Strongly agree - 7

I often worry that my partner will not want to stay with me.

I often worry that my partner doesn't really love me.

I worry that romantic partners won't care about me as much as I care about them.

I often wish that my partner's feelings for me were as strong as my feelings for him or her.

I worry a lot about my relationships.

When my partner is out of sight, I worry that he or she might become interested in someone else.

When I show my feelings for romantic partners, I'm afraid they will not feel the same about me.

I rarely worry about my partner leaving me.

My romantic partner makes me doubt myself.

I do not often worry about being abandoned.

I find that my partner(s) don't want to get as close as I would like.

Sometimes romantic partners change their feelings about me for no apparent reason.

My desire to be very close sometimes scares people away.

I'm afraid that once a romantic partner gets to know me, he or she won't like who I really am.

It makes me mad that I don't get the affection and support I need from my partner.

I worry that I won't measure up to other people.

My partner only seems to notice me when I'm angry.

ECR-R: Attachment Avoidance Items

I prefer not to show a partner how I feel deep down.

I feel comfortable sharing my private thoughts and feelings with my partner.

I find it difficult to allow myself to depend on romantic partners.

I am very comfortable being close to romantic partners.

I don't feel comfortable opening up to romantic partners.

I prefer not to be too close to romantic partners.

I get uncomfortable when a romantic partner wants to be very close.

I find it relatively easy to get close to my partner.

It's not difficult for me to get close to my partner.

I usually discuss my problems and concerns with my partner.

It helps to turn to my romantic partner in times of need.

I tell my partner just about everything.

I talk things over with my partner.

I am nervous when partners get too close to me.

I feel comfortable depending on romantic partners.

I find it easy to depend on romantic partners.

It's easy for me to be affectionate with my partner.

My partner really understands me and my needs.

Multidimensional Experiential Avoidance Questionnaire (MEAQ)

MEAQ: Distraction & Suppression Items

Please indicate the extent to which you agree or disagree with each of the following statements

When something upsetting comes up, I try very hard to stop thinking about it

strongly disagree - 1

moderately disagree - 2

slightly disagree - 3

slightly agree - 4

moderately agree - 5

strongly agree - 6

When negative thoughts come up, I try to fill my head with something else

I usually try to distract myself when I feel something painful

When upsetting memories come up, I try to focus on other things

I work hard to keep out upsetting feelings

When unpleasant memories come to me, I try to put them out of my mind

When a negative thought comes up, I immediately try to think of something else

MEAQ: Repression & Denial Items

Please indicate the extent to which you agree or disagree with each of the following statements

I sometimes have difficulty identifying how I feel

strongly disagree - 1

moderately disagree - 2

slightly disagree - 3

slightly agree - 4

moderately agree - 5

strongly agree - 6

At times, people have told me I'm in denial

I am able to "turn off" my emotions when I don't want to feel

I don't realize I'm anxious until other people tell me

I am in touch with my emotions

People have said that I don't own up to my problems

Others have told me that I suppress my feelings

It's hard for me to know what I'm feeling

I can numb my feelings when they are too intense

Some people have told me that I "hide my head in the sand"

It takes me awhile to realize when I'm feeling bad

I feel disconnected from my emotions

PTSD Checklist (PCL-5)

Repeated, disturbing, and unwanted memories of the stressful experience?

Not at all - 0

A little Bit - 1

Moderately - 2

Quite a bit - 3

Extremely - 4

Repeated, disturbing dreams of the stressful experience?

Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?

Feeling very upset when something reminded you of the stressful experience?

Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?

Avoiding memories, thoughts, or feelings related to the stressful experience?

Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?

Trouble remembering important parts of the stressful experience?

Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)?

Blaming yourself or someone else for the stressful experience or what happened after it?

Having strong negative feelings such as fear, horror, anger, guilt, or shame?

Loss of interest in activities that you used to enjoy?

Feeling distant or cut off from other people?

Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?

Irritable behavior, angry outbursts, or acting aggressively?

Taking too many risks or doing things that could cause you harm?

Being “super alert” or watchful or on-guard?

Feeling jumpy or easily startled?

Having difficulty concentrating?

Trouble falling or staying asleep?

Trauma History Questionnaire (THQ)

The following is a series of questions about serious or traumatic life events. For each event, please indicate whether it happened to you by selecting 'yes' or 'no'.

Has anyone ever tried to take something directly from you by using force or the threat of force, such as a stick-up or mugging?

Yes - 1

No - 0

Has anyone ever attempted to rob you or actually robbed you (i.e., stolen your personal belongings)?

Has anyone ever attempted to or succeeded in breaking into your home when you were not there?

Has anyone ever attempted to or succeed in breaking into your home while you were there?

Have you ever had a serious accident at work, in a car, or somewhere else?

Have you ever experienced a natural disaster such as a tornado, hurricane, flood or major earthquake, etc., where you felt you or your loved ones were in danger of death or injury?

Have you ever experienced a “man-made” disaster such as a train crash, building collapse, bank robbery, fire, etc., where you felt you or your loved ones were in danger of death or injury?

Have you ever been exposed to dangerous chemicals or radioactivity that might threaten your health?

Have you ever been in any other situation in which you were seriously injured?

Have you ever been in any other situation in which you feared you might be killed or seriously injured?

Have you ever seen someone seriously injured or killed?

Have you ever seen dead bodies (other than at a funeral) or had to handle dead bodies for any reason?

Have you ever had a close friend or family member murdered, or killed by a drunk driver?

Have you ever had a spouse, romantic partner, or child die?

Have you ever had a serious or life-threatening illness?

Have you ever received news of a serious injury, life-threatening illness, or unexpected death of someone close to you?

Have you ever had to engage in combat while in military service in an official or unofficial war zone?

Has anyone ever made you have intercourse or oral or anal sex against your will?

Has anyone ever touched private parts of your body, or made you touch theirs, under force or threat?

Other than incidents mentioned in Questions 18 and 19, have there been any other situations in which another person tried to force you to have an unwanted sexual contact?

Has anyone, including family members or friends, ever attacked you with a gun, knife, or some other weapon?

Has anyone, including family members or friends, ever attacked you without a weapon and seriously injured you?

Has anyone in your family ever beaten, spanked, or pushed you hard enough to cause injury?

Have you experienced any other extraordinarily stressful situation or event that is not covered above?

Patient Health Questionnaire (PHQ-8)

Over the last 2 weeks, how often have you been bothered by any of the following problems?

Little interest or pleasure in doing things

Not at all - 0

Several days - 1

More than half the days - 2

Nearly every day - 3

Feeling down, depressed, or hopeless

Trouble falling or staying asleep, or sleeping too much

Feeling tired or having little energy

Poor appetite or overeating

Feeling bad about yourself — or that you are a failure or have let yourself or your family down

Attentive Responding Scale (ARS-18)

I am an active person.

Very true - 4

Mostly true - 3

Somewhat true - 2

A little true - 1

Not at all true - 0

I have an active lifestyle.

I enjoy the company of my friends.

I like to spend time with my friends.

I enjoy relaxing in my free time.

In my time off I like to relax.

I am a very energetic person.

I have a lot of energy.

It frustrates me when people keep me waiting.

It's annoying when people are late.

I spend most of my time worrying.

I worry about things a lot.

I don't like getting speeding tickets.

It feels good to be appreciated.

I'd rather be hated than loved.

I enjoy the music of Marlene Sandersfield.

My favorite subject is agronomy.

I don't like being ridiculed or humiliated.