

Autobiographical Memory and Child Trauma

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### Abstract

This study investigated the relationships among adverse childhood experiences (ACEs), autobiographical memory, reminiscence, rumination, and affect. While many outcomes of experiencing adverse events as a child have been examined thoroughly, extant research reveals mixed views on how child trauma affects autobiographical memory. Participants completed an online questionnaire that assessed the aforementioned variables. Adverse experiences and rumination were both correlated with the following functions of reminiscence: identity, intimacy maintenance, and bitterness revival. Rumination was also associated with the boredom reduction function of reminiscence in addition to the amount of cumulative ACEs individuals reported. These findings suggest that individuals with a history of child trauma are more likely to ruminate and more likely to use maladaptive functions of reminiscence. This study, its findings and implications are discussed.

*Keywords:* adverse childhood experiences, autobiographical memory, reminiscence, rumination

### Autobiographical Memory and Child Trauma

In a study including just over 4,500 children in the United States, 41.2% had experienced some form of physical trauma within the last calendar year (Finkelhor, Turner, Shattuck, & Hamby, 2009). Of the child maltreatment experienced within the sample, 13.7% can be attributed to caregivers and 14.6% of people in the sample reported having been neglected at some point throughout their lifetime. A 2010 Adverse Childhood Experiences (ACES) study involving 53,784 individuals reports a lower, but still worrisome, prevalence of physical trauma (15.9%) while citing that 35% of individuals suffered emotional abuse and 10.9% were victims of sexual abuse (CDC, 2010).

Physical and sexual abuse are most often what come to mind when an individual is asked to think about what severe childhood trauma might entail, but in reality, it exists in many forms (Bornstein, Kaplan, & Perry, 2007). The trauma could be a singular event such as the death of a parent or caregiver, a natural disaster, or a severe vehicular accident. It could also be more chronic such as abuse, domestic violence, and neglect (Rodgers & Eng, 2003). Child trauma has been defined as an intense event or series of ongoing events that the child experiences either directly or indirectly that jeopardizes their emotional or physical well-being (National Child Traumatic Stress Network, 2003).

A physician named Dr. Vincent J. Felitti had been studying obesity and health-related behaviors when he began to notice that obesity was more likely the consequence of other, more inconspicuous problems. This finding led him and many others to work in collaboration with the Centers for Disease Control and Prevention (CDC) and Kaiser Permanente's Department of Preventative Medicine in San Diego on the Adverse

Childhood Experiences (ACE) Study. By assessing childhood exposure to abuse, neglect, and household function along with a myriad of health and social problems such as sexually transmitted diseases and depression, the ACE Study was designed to be the most comprehensive study of childhood trauma to date. The study had more than 17,000 participants and only 33% reported not having experienced adverse events as children. The creation of an ACE score, a scoring system by which participants gained a point for every incidence of trauma occurring before the age of 18, revealed a startling picture of the impact adverse childhood experiences could have on the life of an individual. Participants with an ACE score of four or higher (17% of participants) were 12 times as likely to attempt suicide, seven times more likely to be alcoholics, twice as likely to be smokers, and ten times more likely to have injected street drugs. It is believed that individuals engage in unhealthy behaviors in an attempt to combat the stress associated with the traumatic events, but ultimately these unhealthy behaviors can lead to both disease and disability. Another important finding from the ACE Study is that risk factors for leading causes of death were positively correlated with the ACE scores of individuals, meaning that individuals with more instances of childhood trauma are at greater risk for dying earlier than those who were not exposed to trauma at a young age (Redding, 2003). A follow-up study on the death of original ACE Study participants using the National Death Index in 2006 revealed that 1,539 of the original 17,337 participants had died and those with an ACE score of six or more died an average of 20 years earlier than those without ACEs (Brown et al., 2008).

While there are a multitude of maladaptive consequences associated with suffering adverse experiences as a child, the relationship between these experiences and

the autobiographical memory of the individuals that endured them is lacking thorough investigation (Brown et al., 2007). Autobiographical memories consist of common knowledge about the self, such as the specific role an individual holds in a family, as well as recollections for personal experiences, like what happened on a particular family vacation (Rathbone, Holmes, Murphy, & Ellis, 2015). This integration of both episodic and semantic information is essential in maintaining a strong sense of self and the organization of goals (Conway, Singer, & Tagini, 2004). An individual experiencing autobiographical memory deficits would find it difficult to engage in both simple and complex tasks (Swales, Williams, & Wood, 2001). For example, a college student who aspires to attend graduate school would find it difficult to write a personal statement when they are unable to recollect how their undergraduate experiences led them to become interested in that particular graduate program. A common deficit seen in autobiographical memory is that of overgenerality. Individuals who overgeneralize their autobiographical memories often recall very general or repetitive events in place of more specific, one-time occurrences (Z. Zhang, & J. Zhang, 2008). While there exist many reasons people exhibit memory deficits, overgenerality in autobiographical memory is most often present in individuals who experience depression, suicidal ideation, or traumatic experiences (Gibbs, & Rude, 2004). Current theory proposes that autobiographical memory is overgeneralized in these populations as an effective strategy to avoid reliving emotionally painful memories by recalling surface-level memories (de Decker, Hermans, Raes, & Eelen, 2003).

In research, autobiographical memory is commonly measured by asking participants to recall specific memories from their past and analyzing their responses (van

Vreeswijk & de Wilde, 2004). The participants may be prompted with a specific time period or word in order to foster recollection, but this is not always the case. Once the participant provides a memory, it is then further analyzed either by human judgment or a linguistic computer program. Memories are often placed into one of two categories: specific or general. Specific memories may include something like a particular father and son fishing trip while general memories are often repetitive events like going to the grocery store every Friday night. Recollections can further be analyzed on things like word count, diversity, and content. It is important to consider all facets of a memory, as a recollection could be lengthy, but not specific or elaborate.

Psychological disorders and traumatic experiences are not the only things that exert influence on memory. Mood congruent memory is the phenomenon in which individuals are more likely to recall memories that are in accordance with their affect at the time of recall (Bower, 1981). For instance, if research participants were presented with a vignette about a young child losing his dog and then asked to recall a memory about a childhood pet, they would most likely recollect a gloomier situation than if they were presented with a vignette about a young boy adopting a shelter puppy. Interestingly enough, mood congruency also maps on to agreeableness with others and in reading material. For example, if a person is reading a book while in a delighted mood, they are more likely to retain the positive information information they have read (Bower, Gilligan, & Monteiro, 1981).

Reminiscence is a different aspect of memory. It is more about why the memory is recalled than what content is being recalled. Reminiscence is often the recollection of a memory that serves a certain function for the individual participating in reminiscence.

Boredom reduction, problem-solving, and intimacy maintenance are just some of the functions reminiscence can serve (Webster, 1993). The Reminiscence Functions Scale (RFS) was developed to better understand the reasons why individuals reminisce. The scale measures eight different functions including both beneficial and maladaptive functions. The *boredom reduction* function is most related to passing time when alone, while the *death preparation* function is in place when individuals reminisce in order to organize their thoughts about their own mortality. The *identity* function serves the purpose of self-exploration and *problem-solving* is used to solve current problem by remembering how an individual solved a problem in the past. People also reminisce for ease of conversation (*conversation subscale*) and to keep alive the memory of a dead loved one (*intimacy maintenance subscale*). Individuals who score high on the *bitterness revival* function reminisce in order to keep negative past events salient while those who score high on the *teach/inform* function reminisce in order to impart knowledge to another person through talking about their past. While it may seem that older people reminisce more often than young people as they are perceived as having more experiences to think back on and having more time to engage in the behavior, young people reminisce just as often as older adults (Webster & McCall, 1999).

The reminiscence bump refers to the tendency of adults to recall events from young adulthood with more specificity and volume than other life periods (Glück & Bluck, 2007). There is much debate about why this phenomenon occurs. Some believe it is because cognitive skills often peak in young adulthood, while others attribute high recollection to the major life events that often accompany this period, such as graduating college, getting married, or landing a new job. Other researchers believe the reminiscence

bump exists because of cultural life scripts (Berntsen & Rubin, 2004). Cultural life scripts are different from an individual's autobiographical life story in that they more closely related to semantic memory and not episodic. The life story consists of the experiences of one particular person while cultural life scripts are generalizable (Berntsen & Rubin, 2004). Cultural life scripts are, as the name might imply, largely influenced by the cultural environment that surrounds an individual. An example of a cultural life script of an American man might include things like graduating high school, getting a job, getting married, and having kids. While these life scripts are certainly more generalizable than the life story, they continue to vary continent to continent and even within certain cultures (Rubin, Berntsen, & Hutson, 2009).

While reminiscence is often used to create the life story and evaluate an individual's past, rumination tends to serve a different purpose. Rumination is most accurately defined as a repetitive, negative way of responding to a situation that has caused the individual distress (Nolen-Hoeksema, 2000). Rumination patterns are considered to be fairly stable within individuals and are often highly correlated with psychopathology – especially social anxiety and depression (Wong & Moulds, 2012). Rumination is multi-faceted and thus, there exist many ways to assess rumination among individuals. One way to measure rumination is to provide participants with specific examples of ruminative thoughts and ask them how often they exhibit thoughts similar to the example provided. Rumination is often associated with depression as it is comprised of negative automatic thoughts and often impairs problem solving (Lyubomirsky, Kasri, & Zehm, 2003). The tendency of ruminative people to worry about past social interactions intertwines closely with anxiety, while the repetitive and obsessive thoughts



are more closely related to obsessive-compulsive disorder. The ruminative pathway is heavily debated, though it is commonly defined as the result of continuous thoughts about the negative mood in addition to the thoughts about the precursors and penalties of that negative mood (Smith & Alloy, 2009). Ruminating about unfavorable past events does not change their outcome and the repetitive negative thoughts that accompany rumination increase an individual's chance of being diagnosed with depression or anxiety (Smith & Alloy, 2009).

Extant literature assessing the relationships among autobiographical memory and childhood trauma reports conflicting findings. de Decker, Hermans, Raes, and Eelen (2003) conducted a study of 27 adolescents with nonspecific diagnoses to examine memory, child trauma, and affect. Rather than measuring trauma one dimensionally, such as a simple cumulative amount of adverse events experienced by individuals, researchers assessed the amount of trauma individuals experienced in addition to what types of trauma were experienced and the level of intensity with which they experienced the trauma. Both autobiographical memory and working memory were assessed in this study in an attempt to parse out autobiographical memory deficits from general memory deficits. After controlling for possible confounds, the data revealed that patients with higher trauma scores had more difficulty retrieving specific autobiographical memories than did patients with lower trauma scores. Interestingly enough, other studies argue that autobiographical memory disturbance is less related to trauma and hinges on a diagnosis of major depressive disorder (Wessel, Meeren, Peeters, Arntz, & Merckelbach, 2000). In fact, research shows that areas of the brain associated with autobiographical memory in depressed individuals actually show lower activity levels than those in individuals

without a diagnosis (Whalley, Rugg, & Brewin, 2012). While many view deficits in autobiographical memory as the result of childhood trauma or depression, others believe it precedes these phenomena (Gibbs & Rude, 2004).

Reminiscence and autobiographical memory are closely intertwined constructs of memory. One study investigated the effect of elaborative storytelling by parents to their children and found that it aided in the development of an autobiographical sense of self in the children (Bird & Reese, 2006). Studies have also found that reminiscence can have an effect on affect such that reminiscing about positive events often can improve mood (Bryant, Smart, & King, 2005). While studies have investigated the link between adverse childhood experiences and rumination (Raes et al., 2008), few have examined the possible implications child trauma may have on reminiscing. Of the literature that exists, most focus on specific populations such as holocaust survivors (Lev-Wiesel, 2001) or neglect to analyze the specific functions of reminiscence most employed by individuals with a history of trauma (Thorne et al., 2002).

Based on extant literature, we hypothesize that individuals with more exposure to traumatic events will report less specific autobiographical memories compared to individuals without a history of adverse childhood experiences. We also expect individuals who report negative affect and adverse childhood experiences to also report more negative memories. In addition, we hope to identify relationships among affect, reminiscence, autobiographical memory, adverse childhood experiences, and rumination that have not been previously documented.

## Method

### *Participants*

After discarding incomplete surveys, 111 individuals participated in the study. The sample consisted of both males (26.1%) and females (73.9%) with an average age of 20.03 years ( $SD = 3.81$ ). Participants self-identified as Caucasian (67.6%), Multiracial (13.5%), Latino (4.5%), Native American (4.5%), African (3.6%), and Asian (3.6%). Some participants chose not to disclose their race (2.7%).

### *Materials and Procedure*

This study was administered completely online. Participants were undergraduates at Oklahoma State University enrolled in classes requiring SONA credit as part of their curriculum and were awarded course credit for completing the questionnaire. After consenting to participate in the study, participants were first presented with the *Positive and Negative Affect Schedule* (PANAS; Watson, Clark, & Tellegen, 1988), a 20-item scale that measures affective state. Participants rated how closely they felt an affective word described their current mood on a five-point Likert-type scale ranging from *very slightly or not at all* to *extremely*. Participants then completed the *Reminiscence Functions Scale* (RFS; Webster, 1993), a modified 32-item scale that assesses the functions of reminiscence in individuals. Certain subscales (death preparation and teach/inform) were excluded from this survey as they cater toward older adult populations and this study was primarily focused on college students. The subscales of boredom reduction, identity, problem-solving, conversation, intimacy maintenance, and bitterness revival were all included in this study. The six-point scale used to measure reminiscence ranges from *never* to *very frequently*. *The Autobiographical Memory Self*

*Report* (Piolino et al., 2007) was the next measure completed by participants. This adapted version of an earlier autobiographical memory measure, asked individuals to report three memories between the ages of four and 12 and three between the ages of 13 and 17 in separate, open-ended textboxes. Other than time period, participants were allowed to recall memories without restriction. Both detail and specificity were encouraged and the following statement was used as a guideline for reporting memories: “If you are recalling a vacation at the beach, for example, you must avoid giving general depictions, giving precise memories of a particular event which happened on a particular day during that vacation (Piolino et al., 2007).” After the participant finished reporting each memory, they were asked to provide the age at which the memory occurred along with the vividness, ease of recall, and completeness of the memory. These aspects of the recalled memories were measured from *not at all vivid* to *very vivid*, *very difficult* to *very easy*, and *very incomplete* to *complete*. After that, participants filled out the *Adverse Childhood Experiences Questionnaire - Short Form* (ACES-SF; Felitti et al., 1998) which is a dichotomous 10-item measure that accounts for the cumulative presence of 10 different forms of child trauma an individual may have experienced. While trauma may be broadly understood as physical, sexual, and emotional abuse, this measure also assesses the presence of things like incarceration, divorce, and death of a parent. Answer choices consisted of yes or no, with a text box following any item respondents marked yes for asking the participant at what age the adverse event occurred. Participants then completed the *Ruminative Response Scale* (RRS; Treynor, Gonzalez, & Nolen-Hoeksema, 2003), a 22-item scale that assesses rumination habits on a four point Likert scale that ranges from *never* to *always*. Demographic information was obtained using a

10-item questionnaire that assessed history of traumatic brain injury in addition to traits such as age and sex. Lastly, a two-part question asked participants to indicate if there existed any such reason to discard their data in an attempt to increase the validity of the study. Participants were reminded that their SONA credits were not dependent upon their answer to this question. After these measures were completed, participants were debriefed with information about the study as well as provided with appropriate psychological resources in the event they experienced distress as a result of participating in the study.

### **Results**

Autobiographical memories were analyzed using the Linguistic Inquiry and Word Count Program (Pennebaker, 2015) and all correlations were computed using SPSS.

#### *ACEs*

As expected, amount of ACEs was positively correlated with rumination  $r(111) = .433, p < .001$ . Amount of ACEs was also significantly correlated with the following reminiscence functions: identity  $r(111) = .292, p = .002$ , intimacy maintenance  $r(111) = .267, p = .005$ , and bitterness revival  $r(111) = .227, p = .017$ . Amount of ACEs individuals were exposed to had no significant relation to either positive  $r(111) = .122, p = .201$ , or negative  $r(111) = .177, p = .064$  affective state. ACEs were not significantly correlated with ease of recall  $r(111) = -.099, p = .302$ , completeness  $r(111) = .007, p = .940$ , or vividness  $r(111) = -.017, p = .862$ , in autobiographical memory. Selected ACEs correlations are presented in Table 1.

#### *Rumination*

In addition to being positively correlated with amount of ACEs, rumination was significantly correlated with negative affect  $r(111) = .386, p < .001$ , and ease of recall  $r(111) = -.218, p = .022$ . Rumination was also positively correlated with boredom reduction  $r(111) = .362, p < .001$ , identity  $r(111) = .254, p = .007$ , intimacy maintenance  $r(111) = .329, p < .001$ , and bitterness revival  $r(111) = .474, p < .001$ . Selected rumination correlations are presented in Table 2.

#### *Other relationships*

Autobiographical memory word count was significantly correlated with ease of recall  $r(111) = .366, p < .001$ , completeness  $r(111) = .304, p = .001$ , and vividness  $r(111) = .325, p < .001$  of autobiographical memory. Negative affect was significantly correlated with reminiscing for the purpose of bitterness revival  $r(111) = .313, p = .001$ . Additionally, reported autobiographical memories averaged 91.89% authenticity when analyzed in LIWC.

### **Discussion**

This study resulted in better understanding of the relationships among affect, reminiscence, autobiographical memory, adverse childhood experiences, and rumination in addition to replicating previous phenomena among some of these psychological aspects. The relationships between ACEs and various functions of reminiscence in a nonclinical population are both novel and worth further examining. The correlation between amount of ACEs and intimacy maintenance may suggest that individuals who have lost a loved one in childhood reminisce in order to keep their memory of that person alive. The relationship between ACEs and the identity function of reminiscence leads us to believe that people who have endured traumatic events may incorporate their past into

their present self-concept more than those who have not experienced such events. The relationship between ACEs and bitterness revival may imply that individuals with higher amounts of adverse experiences keep negative events more salient in their minds, which is consistent with previous research and may be related to depression pathways (Clasen, Wells, Ellis, & Beevers, 2013).

The finding that there exists a strong positive correlation between rumination habits and negative affect is consistent with previous research that examined a much larger sample and found that rumination was a viable predictor of depressive disorders (Nolen-Hoeksema, 2000). The relationships among ruminative thinking and reminiscence functions have been explored much less. The fact that frequent ruminators reminisce for the purpose of identity, intimacy maintenance, and bitterness revival implies similar implications as were mentioned with the ACEs findings. Specifically, frequent ruminators reminisce for the purposes of self conceptualization, remembering people who are no longer present in their lives, and keeping negative past events salient in their mind. Boredom reduction, the other significant relationship among rumination and reminiscence functions, may suggest that individuals who ruminate often tend to spend more of their free time thinking about past events rather than engaging in new experiences.

Though we expected to see a significant negative correlation between autobiographical memory word count and amount of ACEs individuals experienced, we did not. The significant relationship between word count and vividness, completeness, and ease of recall leads us to believe that participants exhibited excellent awareness about their capacity to recall memories. The high average authenticity rate, which is computed

by an algorithm within the LIWC program, for autobiographical memories subdues worry that participants might have fabricated memories as high rates of authenticity indicate honest, genuine text.

These findings could prove valuable in providing treatment for individuals who ruminate frequently or have experienced child trauma, especially when working with individuals to adjust the way they think about their past experiences in relation to their current sense of identity. The results from this study are purely correlational, but suggest that individuals who have experienced adverse events integrate their past experiences into their present sense of self and spend more time thinking negatively about past events than people without a history of trauma.

#### *Limitations*

Certain limitations must be considered when participants do not complete a study in a laboratory setting. Even with the addition of a validity question, it is possible that individuals did not complete the survey as thoroughly as they might have if it was administered in person. However, administering the study online can be justified as ACEs and autobiographical memory content alike are considered to be very personal. If participants had completed this study in the lab, it is possible that they would have answered with much less honesty. This study is limited in the ability to infer findings to a diverse population due to the homogeneity of the participants. As the sample is mainly comprised of White, college-aged students, findings cannot be generalized to other populations. Additionally, the analyses of human memories by the LIWC provides a limitation as to whether or not the true content of autobiographical memories was assessed. LIWC codes text word by word, meaning that the word “mad” is coded as an



emotion word and an anger word, though the participant could have used it in the context of being “madly in love”. That is just one example of how implementing a text coding program can confuse the true meaning of text reported by a participant, though many others exist. Another possible confound within this study was the example memory given to participants as listing a memory of a family vacation at the beach has an inherently positive valence to it. This subtly positive prompt could have caused participants to report more positive memories than a neutral example would have, resulting in skewed autobiographical memory data. Lastly, the study did not directly measure depression in participants, which is a limitation as depression is known to be associated with autobiographical memory disturbance (Gibbs, & Rude, 2004).

#### *Future Directions*

Further exploration of these phenomena should include aspects of autobiographical memory that have yet to be analyzed such as investigating differences between younger (4 – 12 years) memories and older (13 – 17 years) memories. The inclusion of a sample more diverse participants in both age and race should be recruited to increase generalizability of results. In an effort to reduce possible technological disconnect associated with the current study, autobiographical memories should be coded by research assistants rather than LIWC. For sake of better understanding the relationships that may exist among depression and the variables examined in this project, future projects should incorporate both a measure of depression and a more widely accepted way of assessing autobiographical memory such as the *Autobiographical Memory Test* (Williams & Broadbent, 1986).

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Table 1.  
*Correlations among ACEs and Reminiscence Functions Subscales*

	ACEs	Boredom Reduction	Identity <sup>1</sup>	Problem Solving <sup>1</sup>	Conversati-on <sup>1</sup>	Intimacy <sup>1</sup>	Bitterness Revival <sup>1</sup>
ACEs	--						
Boredom Reduction	.102	--					
Identity <sup>1</sup>	.292**	-.338**	--				
Problem Solving <sup>1</sup>	.026	.090	.114	--			
Conversati-on <sup>1</sup>	-.124	.314**	.270**	.193*	--		
Intimacy <sup>1</sup>	.267**	.417**	.735**	.169	.448**	--	
Bitterness Revival <sup>1</sup>	.227*	.484**	.403**	.229*	.177	.520**	--

*Note* items marked with <sup>1</sup> are subscales from the RFS

\*Signifies significance at the .05 level

\*\*Signifies significance at the .01 level



Table 2.  
*Correlations among rumination, ACEs, affect, and aspects of autobiographical memory*

	Rumination	ACEs	Positive Affect	Negative Affect	Vividness	Ease	Completeness
Rumination	--						
ACEs	.433**	--					
Positive Affect	-.044	.122	--				
Negative Affect	.386**	.177	.225*	--			
Vividness	-.155	-.017	.062	-.215*	--		
Ease	-.218*	-.099	.062	-.189*	.850**	--	
Completeness	-.127	.007	.146	-.169	.866**	.862**	--

*Note* \*Signifies significance at the .05 level  
 \*\*Signifies significance at the .01 level