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Reduced autobiographical memory specificity among maltreated preschoolers: The indirect effect of neglect through maternal reminiscing

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Abstract

Maternal reminiscing and preschoolers' ($M = 5.00$ years, $SD = 1.11$) autobiographical memory specificity (AMS) were examined among abusive ($n = 24$), neglecting ($n = 78$), emotionally maltreating ($n = 32$), and demographically similar nonmaltreating families ($n = 74$). Neglect was negatively associated with child AMS and the quantity of maternal elaborations. In a moderated mediation model, neglect was negatively associated with the quantity of maternal elaborations, which was positively associated with AMS when mothers reminisced in a coherent and sensitive manner (i.e., affective quality). In the context of high maternal affective quality, maternal elaborative quantity accounted for reduced AMS among neglected preschoolers. The findings extend observations of reduced AMS to neglected preschoolers and inform theoretical models of autobiographical memory development.

Autobiographical memory is a type of explicit memory that is specialized for encoding, storing, and retrieving self-relevant personally experienced events that make up one's life story (Nelson & Fivush, 2004). Autobiographical memories reflect unique experiences that occurred at a specific location and during a specific time in one's past. However, some individuals have difficulty retrieving specific autobiographical memories and instead recount reoccurring events or experiences that took place over an extended period of time, a phenomenon known as overgeneral memory (OGM). The degree to which individuals recount specific (e.g., "I was mad yesterday when...") or overgeneral memories (e.g., "Last summer, I...") is of clinical significance because OGM is observed among individuals with psychopathology, including post-traumatic stress disorder and depression (Hitchcock, Nixon, & Weber, 2014; Williams et al., 2007 for reviews). In addition, individuals with histories of childhood abuse have been observed to have elevated levels of OGM independent of current psychopathology (Henderson, Hargreaves, Gregory, & Williams, 2002; Ogle et al., 2013; Valentino, Bridgett, Hayden, & Nuttall, 2012). Therefore, the development and maintenance of OGM, or reduced autobiographical memory specificity (AMS), may be a critical component of the cognitive and psychological sequelae of child maltreatment.

According to the self-memory model, autobiographical memories are retrieved in a top-down fashion following a hierarchy from general to specific memories (Conway & Pleydell-Pearce, 2000; Williams et al., 2007). Dominant etiological theories of OGM adopt this

framework and posit that individuals with a history of trauma passively avoid recounting specific autobiographical memories as a functional avoidance emotion regulation strategy intended to limit negative affect by reducing trauma-related cognitions (Williams, 1996). In turn, such individuals abandon memory searches at the general level (Conway & Pleydell-Pearce, 2000; Williams, 1996). Revised etiological models incorporate cognitive (e.g., working memory) and self-system (e.g., negative self-representations) deficits as contributors to OGM (Williams et al., 2007). However, despite the fundamental importance of early traumatic experiences in etiological models of OGM, the aforementioned theoretical accounts are limited in their conceptualization regarding the emergence of OGM during childhood and in integrating ecological factors at multiple levels of analysis that may be associated with the development of reduced AMS among typical and atypical populations.

Recently, a developmental psychopathology model of OGM (Valentino, 2011) integrated theories of normative and atypical autobiographical memory development to identify mechanisms at multiple ecological levels that may underlie the emergence of OGM during childhood. Drawing on the sociocultural theory of autobiographical memory development (Nelson & Fivush, 2004), which emphasizes the importance of early mother-child discussions about past experiences (i.e., reminiscing) in fostering children's autobiographical memory, the developmental psychopathology model of OGM posits that maternal reminiscing may facilitate children's AMS and that impoverished maternal reminiscing among at-risk families may be a critical mediator through which early traumatic experiences exert influence on reduced AMS (also see Salmon & Reese, 2015). Emerging empirical evidence demonstrating an association between maternal reminiscing and AMS among typically developing preschoolers provides initial support for the developmental psychopathology model (Jobson, Burford, Burns, Baldry, & Wu, 2018; McDonnell, Valentino, Comas, & Nuttall, 2016; Valentino, McDonnell, Comas, & Nuttall, 2018; Valentino et al., 2014). However, the association between maternal reminiscing and children's AMS has yet to be evaluated in atypical developmental contexts, including among maltreating families. Furthermore, previous research has not examined AMS among maltreated preschoolers, with the extant work conducted among maltreated elementary-aged children and adolescents (see Hitchcock et al., 2014; Stewart, Hunter, & Rhodes, 2017 for reviews). Identifying whether maltreatment is associated with reduced AMS during the preschool years, an important period for autobiographical memory development (Nelson & Fivush, 2004), can inform the progression of reduced AMS among maltreated individuals.

There are several reasons to anticipate that experiences of maltreatment may exert influence on preschoolers' AMS through impoverished maternal reminiscing. Maltreatment is considered to be a pathogenic relational experience occurring within the family that represents extreme deviations from acceptable and anticipated parenting behaviors (Cicchetti & Valentino, 2006). Approximately 90% of the cases of child abuse and neglect in the United States are perpetrated by parents (USDHHS, 2018). Mothers are particularly at-risk for perpetrating maltreatment given their frequent position as the primary caregiver. In addition to specific instances of abuse or neglect, everyday interactions among maltreating families are often devoid of the sensitive guidance necessary to foster development, putting maltreated children at-risk for a host of cognitive and psychological sequelae (Wilson, Rack, Shi, & Norris, 2008).

The extreme poverty and chaotic family environments that many maltreating and at-risk families are situated may undermine mothers' abilities to scaffold their children's autobiographical memory development through elaborative and affectively sensitive reminiscing (Laible, 2011). Risk factors associated with perpetrating maltreatment, such as parents own childhood trauma, psychopathology, and socioemotional deficits (Cicchetti & Valentino, 2006), may further inhibit maltreating mothers' abilities to discuss past emotional experiences with their children in a manner that fosters children's development (Koren-Karie, Oppenheim, & Getzler-Yosef, 2008). For example, maltreating mothers have more difficulty identifying the origin of their children's emotions and are less appreciative of the mother-child relationship as a context for their children's emotional expressions than nonmaltreating high-risk mothers (Shipman & Zeman, 2001). Compared with demographically similar mothers, mothers from abusive families (Shipman et al., 2007; Valentino, Cicchetti, Toth, & Rogosch, 2006), and maltreating mothers more generally (not specified by subtype; Valentino et al., 2015) have been observed to engage in less frequent conversations with their children and as having a less elaborative reminiscing style.

Substantial empirical evidence demonstrates that children's autobiographical memory is facilitated by the *quantity* of maternal elaborations during reminiscing, operationalized as the number of maternal wh- questions, yes or no questions, elaborative statements, and confirmations (Fivush, 2011; Nelson & Fivush, 2004). Mothers who are high in elaborative quantity provide opportunities for enhancing children's understanding of narrative form and for rehearsing event details, which in turn strengthens children's memory traces. The narrative and mnemonic skills that children acquire during early mother-child reminiscing often transfer to independent memory retrieval contexts (Fivush, 2011; Nelson & Fivush, 2004). The benefit of having a mother who is high in elaborative quantity is hypothesized to foster children's abilities to recount specific autobiographical memories, irrespective of the number of details, given the broad mnemonic competencies children acquire when interacting with elaborative mothers (Valentino et al., 2014). However, mothers who are low in elaborative quantity, such as maltreating mothers, may not provide the rehearsal and the reinforcement necessary to aid children's abilities to independently recall specific autobiographical memories (Valentino, 2011).

The affective *quality* of maternal reminiscing captures maternal sensitive guidance in a more holistic manner and is defined by the degree to which mothers accept their children's emotional expressions, display genuine interest in reminiscing, and foster the co-construction of coherent and emotionally-adequate narratives (Koren-Karie, Oppenheim, Haimovich, & Etzion-Carasso, 2003). Mothers who talk with their children in a manner that supports autonomy, by following their children's lead and by responding sensitively to their children's expressions (irrespective of the quantity of maternal elaborations), have children who are more engaged in reminiscing (Cleveland & Morris, 2014) and provide more detailed independent reports of their experiences compared with children of mothers who are less sensitive and more controlling (Principe, Trumbull, Garder, Van Horn, & Dean, 2017). When maternal reminiscing is sensitive and coherent (high in affective quality), children's understanding of events and their ability to incorporate their experiences into their autobiography are enhanced (Bird & Reese, 2006; Koren-Karie et al., 2003). Given the central importance of the self as an organizational schema for autobiographical memory

(Conway & Pleydell-Pearce, 2000; Nelson & Fivush, 2004), and the emphasis of self-system functioning in etiological models of OGM (Williams, 1996; Williams et al., 2007), maternal sensitive guidance during collaborative recall may be particularly relevant for children's developing AMS. Indeed, significant associations between the affective quality of maternal reminiscing and children's AMS have been observed among typically developing families (Jobson et al., 2018; Valentino et al., 2014, 2018).

A self-determination perspective of maternal reminiscing suggests that maternal provision of elaborations (elaborative quantity) and the affective tone in which the elaborations are delivered (affective quality) are independent constructs associated with children's motivation and competence for talking about the past (Cleveland & Morris, 2014; Cleveland & Reese, 2005). In support of this perspective, correlational and experimental studies have identified that the quantity of maternal elaborations and the affective nature of maternal reminiscing are distinct dimensions on which mothers can simultaneously vary (Cleveland & Morris, 2014; Cleveland & Reese, 2005; McDonnell et al., 2016; Principe et al., 2017). For example, a mother who provides a high volume of elaborations in a dismissing manner that serves a self-driven agenda would be high in elaborative quantity, but low in the affective quality of maternal reminiscing.

In addition, this perspective postulates that children's autobiographical memory is enhanced when maternal reminiscing provides children with the necessary tools for retrieving and conveying autobiographical memories and fosters children's engagement in reminiscing and a cohesive autobiography (Cleveland & Morris, 2014; Cleveland & Reese, 2005). Existing work suggests that there may be additive effects of the quantity of maternal elaborations and the affective quality of maternal reminiscing in promoting children's independent autobiographical memory retrieval. For example, children of mothers who reminisce in a high elaborative and sensitive manner have been observed to provide the most complete and accurate event reports to researchers compared with children of mothers who are low on one or both reminiscing dimensions (Cleveland & Reese, 2005; Principe et al., 2017). McDonnell and colleagues (2016) extended this work to AMS among typically developing preschoolers and showed that preschoolers' AMS increased as maternal structural elaborations (i.e., non-emotional information and questions regarding contextual details) and emotion elaborations (i.e., references and questions regarding emotions) increased. However, maternal emotion elaboration was negatively associated with preschoolers' AMS in the absence of maternal structural elaboration. The combination of high maternal elaborative quantity and sensitive guidance during reminiscing may be critical to facilitate preschoolers' abilities to retrieve specific autobiographical memories.

The current investigation aims to unite the literatures on AMS and maternal reminiscing to empirically evaluate the hypothesis that impoverished maternal reminiscing mediates the association between maltreatment and reduced AMS (Salmon & Reese, 2015; Valentino, 2011). The goals of the current study represent novel extensions of the existing literature. First, we examined whether an association between maltreatment and preschoolers' AMS depends on maltreatment subtype (i.e., abuse, neglect, or emotional maltreatment). We expected to observe reduced AMS among all maltreated preschoolers compared with nonmaltreated preschoolers. This effect was anticipated to be especially large among abused

preschoolers given previous observations of OGM among abused school-aged children (Valentino, Toth, & Cicchetti, 2009) and the theoretical significance of abuse in OGM (Williams, 1996; Williams et al., 2007). No previous publications with this dataset nor elsewhere have examined AMS among a sample of maltreated children during the preschool years.

Secondly, we hypothesized that mothers of abused, neglected, and emotionally maltreated preschoolers would be significantly lower in the elaborative quantity and affective quality of maternal reminiscing compared with nonmaltreating mothers. Previous publications using a subsample of the current participants reported that maltreating mothers were lower in the elaborative quantity of their reminiscing compared with demographically similar nonmaltreating mothers (Lawson, Valentino, McDonnell, & Speidel, 2018; Valentino et al., 2015). However, no previous publications with this dataset nor elsewhere have examined maternal elaborative quantity or affective quality by maltreatment subtype (i.e., abuse, neglect, emotional maltreatment). Hypotheses regarding the elaborative quantity and affective quality of maternal reminiscing among mothers of abused, neglected, emotionally maltreated, and nonmaltreated preschoolers are unique to the current investigation.

Thirdly, we hypothesized that impoverished maternal reminiscing among maltreating families would mediate the association between maltreatment and reduced AMS (Salmon & Reese, 2015; Valentino, 2011). Specifically, we hypothesized that maternal affective quality would conditionally mediate the association between maltreatment and reduced AMS in the context of high elaborative quantity. Maltreatment was expected to be associated with lower affective quality, which in turn was anticipated to be positively associated with AMS when maternal elaborative quantity was high (Cleveland & Reese, 2005; McDonnell et al., 2016). An additive effect of maternal affective quality and elaborative quantity was anticipated to promote children's AMS. Thus, the indirect effect of maltreatment on reduced AMS through maternal affective quality was posited to depend on the elaborative quantity of maternal reminiscing. Data from the current study were drawn from a larger randomized clinical trial aimed to increase maternal sensitivity among maltreating mothers and to bolster associated child outcomes. All hypotheses and analyses were novel to the current investigation.

Method

Participants

Participants were 248 children (165 maltreated and 83 nonmaltreated) between the ages of 3- to 6-years-old ($M = 4.90$, $SD = 1.14$) and their mothers. Family Case Workers in the Department of Child Services (DCS) introduced the project to potentially eligible maltreating families. With maternal consent, Family Case Workers provided contact information of interested families to the research staff. The research staff then contacted interested mothers and conducted an initial screening for eligibility, which included having a child between the ages of 3- to 6-years-old, a history of involvement with DCS where the mother was a perpetrator of at least one instance of abuse or neglect, and both the mother and the child were primarily English speaking. Along with maternal report, DCS records were reviewed to confirm the maltreating status of the families. All maltreating families had substantiated child maltreatment where the mother was the perpetrator of at least one

instance of abuse or neglect, with 98% of the maltreated children in the current sample having government documentation of victimization. Families without government documentation of abuse or neglect against the child participant ($n = 3$) were excluded from our analysis.

Nonmaltreating families were recruited within the community at locations that typically serve demographically similar families, such as Head Start, the Special Supplemental Nutrition Program for Women, Infants, and Children's office, and the housing authority. Nonmaltreating families did not have a history of child maltreatment nor previous involvement with DCS, which was verified with maternal interview and by DCS. All children lived with their mothers while enrolled in research activities. In total, 315 families were assessed for eligibility, with 67 not meeting the inclusion criteria for the nonmaltreating nor maltreating groups. Data were collected from April, 2013 to October, 2017 in a mid-sized city in a Midwestern state that is nationally ranked within the top 10 states with the highest amount of child maltreatment victims proportional to the states' population (USDHHS, 2018).

Six dyads were excluded from the analysis for the following reasons: the autobiographical memory test was not administered (one nonmaltreated and two maltreated children), dyads only discussed the happy event during reminiscing (see mother-child reminiscing procedure below; one nonmaltreating family), dyads did not reminisce in English (one nonmaltreating family), and relevant data was unavailable due to audiovisual recording errors (one maltreating family). In addition, some children ($n = 25$; 6 nonmaltreated and 19 maltreated) did not engage in the autobiographical memory test. Many of these children were unresponsive towards the examiner and walked away during the assessment. Whether children engaged in the autobiographical memory test did not depend on their maltreatment status, $\chi^2(1) = 1.13, p = .29$. However, disengaged children were significantly younger ($M = 4.21, SD = 1.13$) and had significantly lower expressive language abilities ($M = 81.13, SD = 11.88$) compared with engaged children ($M_{age} = 4.99, SD = 1.12$; $M_{language} = 92.77, SD = 11.16$), $t(237) = -3.29, p = .001, d = -0.69$; $t(237) = -4.90, p < .001, d = -1.01$, respectively. The majority of the disengaged children (56.0%) were 3-years-old. Children who were disengaged during the autobiographical memory test were excluded from the following analysis to avoid artificially deflating the number of specific autobiographical memories provided by children who were engaged in the task.

Maltreatment Classification System (MCS).—To further corroborate the nature of maltreatment within our sample, DCS records of maltreating families were coded in accordance with the MCS (Barnett, Manly, & Cicchetti, 1993). *Sexual abuse* was coded when records indicated attempted or actual sexual contact between the child and an adult. *Physical abuse* was coded if the child sustained non-accidental injuries. *Physical neglect* was identified when the caregiver failed to meet the child's basic needs for food, clothing, shelter, health care, hygiene, or safety. *Emotional maltreatment* was coded when records indicated chronic or extreme neglect or disregard for the child's emotional needs. Instances of witnessing domestic violence were coded as emotional maltreatment. *Moral-legal or educational maltreatment* was coded when caregivers exposed or encouraged their children to engage in illegal activities or if the child did not receive age-appropriate education.

Thirty-two DCS records of maltreating families (19% of the entire maltreating sample) were double coded. Reliability was established (κ s = .81 – 1.00).

Consistent with the distribution of maltreatment subtypes in the general population (USDHHS, 2018), 4.3% of the maltreated children in the current sample experienced sexual abuse, 12.3% experienced physical abuse, 66.7% experienced physical neglect, 60.5% experienced emotional maltreatment, and 38.3% experienced moral-legal or educational maltreatment. The majority of maltreated children (61.7%) experienced multiple forms of maltreatment, a proportion consistent with previous findings regarding maltreatment subtype comorbidity (e.g., Manly, Kim, Rogosch, & Cicchetti, 2001).

A hierarchy representing the degree to which a particular form of maltreatment violates social norms was used to classify the maltreated children into mutually exclusive subtype groups. Following previous research (Howes, Cicchetti, Toth, & Rogosch, 2000; Toth, Cicchetti, Macfie, Maughan, & Vanmeenen, 2000; Valentino et al., 2009), the order of the hierarchy was sexual or physical abuse at the top, followed by neglect, emotional maltreatment, and moral-legal or educational maltreatment. Children who experienced sexual or physical abuse regardless of whether they also experienced physical neglect, emotional maltreatment, or moral-legal or educational maltreatment were coded as *abused* ($n = 24$). Children who experienced physical neglect without physical or sexual abuse regardless of emotional and moral-legal or educational maltreatment were coded as *neglected* ($n = 78$). Children who were emotionally maltreated without sexual abuse, physical abuse, or neglect, but regardless of moral-legal or educational maltreatment, were coded as *emotionally maltreated* ($n = 32$). Children who only experienced *moral-legal or educational maltreatment* were coded as such ($n = 6$), but were not included in the remaining analyses because of power limitations with the small subgroup. The average length of days since the first instance of abuse or neglect that qualified children into their respective subtype group and the assessment from which the primary variables were measured was approximately 10 months ($Mdn = 288$ days), with a range of 9–2,023 days. A Kruskal-Wallis test showed that the number of days between the incident of maltreatment and the assessment did not significantly differ among the abused ($Mdn = 288.50$), neglected ($Mdn = 314.50$), and emotionally maltreated ($Mdn = 276.00$) groups, $H(2) = 2.38$, $p = .30$. In total, 208 dyads (134 maltreating, 74 nonmaltreating) were included in the following analysis.

Procedure

All families participated in a two-hour laboratory baseline assessment as part of a larger randomized clinical trial. Children and their mothers completed several measures in separate rooms with different researchers. The autobiographical memory test was completed early in the baseline assessment to avoid priming or biasing children's memory with additional narrative tasks. Approximately halfway through the assessment, mothers and their children took a break, and then were reunited for reminiscing. After the baseline assessment, approximately half ($n = 83$) of the maltreating families underwent a 6-week intervention as part of the randomized clinical trial. Families returned to the laboratory approximately 8-weeks after the baseline assessment. A child language measure was administered at that

time. All researchers were naïve to the maltreating status of the families and to the study hypotheses.

Autobiographical Memory Test—Preschool Version (AMT-PV).—The AMT-PV is a cue word paradigm in which preschoolers are tasked with recounting times that they felt certain ways (Nuttall, Valentino, Comas, McNeill, & Stey, 2014). Ten cue words were orally and visually presented to children in a serial and fixed order that alternated between five positive and five negative emotion words (i.e., happy, mad, surprised, sad, lucky, scared, strong, tired, smart, hungry). For each cue word, children were instructed to, “Tell me one time that you felt ____.” To ensure that children understood the task, an additional prompt was given (e.g., “Tell me just *one time* when you felt ____.”) if an initial response was overgeneral or if the child did not provide a response after one minute. Researchers refrained from clarifying the meaning of the cue word and from providing examples of events because unstandardized provision of additional clarification or explanation could bolster semantic associates that may affect autobiographical memory retrieval. Item response theory and confirmatory factor analyses revealed that the factor structure of the AMT-PV is comparable to that of the AMT that was designed to be used with adults (Williams & Broadbent, 1986), supporting the validity of this measure with preschoolers (Nuttall et al., 2014). In the current sample, split-half reliability was adequate ($r = .79$).

Mother-child reminiscing.—Mothers and their children reminisced about four one-time events that they experienced together. Because reminiscing about everyday negative experiences (as opposed to reminiscing about positive events) trends to be more elaborative and is particularly critical for fostering development (Laible, 2011), we predominately focused on mother-child reminiscing about negative events by following the Autobiographical Emotional Events Dialogue procedure (AEED; Koren-Karie et al., 2003). Mothers were instructed to reminisce with their children about times that their child felt happy, sad, scared, and angry. Before reuniting with their children, mothers were told to elect everyday experiences that their children would likely remember for each of the emotion categories. If mothers selected events that may have been traumatic to their children or events that occurred too early in development for children to recall (i.e., during infancy), mothers were encouraged to select another event. Discussions of traumatic events were discouraged given the potential for differential mother-child reminiscing for traumatic events compared with everyday emotional experiences (Fivush & Sales, 2006).

Mothers wrote brief descriptions of the events on index cards, which mothers were allowed to reference during reminiscing for a reminder of the events to discuss if necessary. Mothers were told to talk with their children like they normally would at home. Reminiscing occurred in a private room that was equipped with a couch. Researchers were not present when the dyads reminisced. Following the AEED procedure, all dyads discussed each event separately (happy, sad, scared, angry). The reminiscing task was self-paced. There were no restrictions regarding the duration of the task. The entire reminiscing task lasted approximately 5- to 15-minutes and was video recorded. Examples of events discussed include going to the beach (happy), losing a pet (sad), being chased by a dog (scared), and fighting with siblings (angry).

Kaufman Assessment Battery for Children, 2nd edition (KABC-II) Number

Recall.—The number recall task of the KABC-II (Kaufman & Kaufman, 2004) assesses working memory among 3- to 18-year-olds. In this task, an administrator reads a list of numbers to the child and instructs the child to repeat the numbers in the order that they were read. The amount of numbers read to children increases as children successfully complete earlier stages of the task. Number recall was included in the current study to control for children's working memory in all substantive AMS analyses.

Expressive Vocabulary Test, 2nd edition (EVT-2).—The EVT-2 (Williams, 2007) was administered to children as an assessment of expressive language abilities. Children's standardized EVT-2 scores were included as a covariate in all substantive AMS analyses because children's expressive vocabulary skills could confound their performance on this task.

Peabody Picture Vocabulary Test, 4th edition (PPVT-4).—The PPVT-4 (Dunn & Dunn, 2007) is an assessment of receptive language abilities that is validated for use among 2- to 90-year-olds. The PPVT-4 was administered to mothers during the baseline assessment.

Coding and Reliability

Autobiographical memory specificity.—Video recordings of the AMT-PV were transcribed verbatim. Consistent with established standards for coding the AMT (Williams & Broadbent, 1986), the first response for each cue word was coded as overgeneral (scored as 0) or specific (scored as 1). *Specific autobiographical memories* were defined as responses that referenced a particular event that lasted one day or less. *Overgeneral autobiographical memories* were defined as responses that referred to repeated events (e.g., "Every day at school ...") or events that occurred over extended periods of time (e.g., "Last winter ..."). In addition, failures to respond, repetitions of the cue word, or responses involving future events (e.g., "I'll be tired tomorrow.") were coded as overgeneral. Because there is debate regarding whether lack of response represents genuine overgeneral memory retrieval strategies or alternative processes (e.g., distraction; Griffith et al., 2012), our analyses were conducted on the total number of specific memories children recounted during the AMT-PV. Fifty-one transcripts (21% of the full sample) were double coded. Reliability was established (κ s = .66—.96; M = .84).

Maternal reminiscing.—Maternal elaborative quantity and affective quality were coded separately. Video recordings of mother-child reminiscing were transcribed verbatim and coded for the quantity of maternal elaborations. Statements were partitioned into utterances, defined as subject-verb propositions. Following established frequency based coding schemes (e.g. Fivush & Sales, 2006; Principe et al., 2017; Van Bergen, Salmon, Dadds, & Allen, 2009), maternal wh- questions (open-ended elaborations), yes or no questions (closed-ended elaborations), elaborative statements, and confirmations were identified. Provisions of new information were coded as elaborative statements. Affirmations of children's statements (e.g., "That's right!") were coded as confirmations. Repetitive utterances were also identified, but were not included in the current analysis. The number of non-repetitive wh- questions, yes or no questions, elaborations, and confirmations were summed across the four

reminiscing conversations. Repetitions of statements or questions were not included in the totals. Interrater reliability on the total number of non-repetitive wh- questions, yes or no questions, elaborations, and confirmations was assessed with 31 transcripts (13% of the full sample) and reliability was established ($ICCs = .77$ – 1.00). Each maternal elaborative quantity variable was square-root transformed to alleviate substantial positive skew ($Z_{skew} = 5.69$ – 12.98 , $ps < .001$).

Video recordings of the reminiscing task were viewed to code the affective quality of maternal reminiscing, irrespective of the number of elaborations, following the AEED protocol (Koren-Karie et al., 2003). The affective quality of maternal reminiscing was coded on seven dimensions: (1) Focus on the task (mother maintains focus on reminiscing and relevant details); (2) Acceptance and tolerance (mother allows their child to express a range of emotional themes without judgment and without becoming defensive); (3) Involvement and reciprocity (mother is positively engaged with their child and shows genuine interest in reminiscing); (4) Resolution of negative feeling (mother navigates discussions of negative experiences towards positive resolutions by emphasizing their child's emotional regulation abilities); (5) Structuring (mother facilitates the co-construction of rich and coherent narratives); (6) Coherence (narratives are fluent and clear); and (7) Adequacy of the stories (narratives are affectively consistent with the emotional themes). Each dimension was rated on a 9-point scale, with higher values indicating a higher level of the behaviors associated with a particular scale. Researchers provided ratings for each scale after watching the entire reminiscing task. Interrater reliability was assessed with 21% ($n = 51$) of the dyads in the full sample. Reliability was achieved ($ICCs = .73$ – $.93$).

Analytic Strategy

All children included in the subsequent analyses completed the AMT-PV and all mother-child dyads reminisced. However, two maltreating mothers did not complete the PPVT-4 and two children (one maltreated) did not complete the KABC-II number recall task. In addition, at the time of writing, 23 families (16 maltreating) had not completed the 8-week assessment during which the EVT-2 was administered. Multiple imputation using the expectation-maximization method in SPSS was conducted over 25 iterations to handle missing data with the demographic and primary study variables included as auxiliary variables.

Results

Descriptive Analyses

Nonmaltreated, abused, neglected, and emotionally maltreated dyads did not significantly differ on a number of important demographic characteristics (see Table 1). However, groups significantly differed on child language, $F(3, 204) = 6.04$, $p = .001$, $\eta_p^2 = .08$, and maternal marital status, $\chi^2(3) = 15.02$, $p = .002$, $\phi_c = .27$. Neglected children had significantly lower language scores compared with nonmaltreated, $t(150) = -4.05$, $p < .001$, $d = -0.66$, and emotionally maltreated children, $t(108) = -2.05$, $p = .04$, $d = -0.45$. Regarding maternal marital status, a post hoc analysis of the adjusted standardized residuals revealed that significantly more nonmaltreating mothers were married than expected ($Z = 3.83$, $p = .002$) and significantly fewer nonmaltreating mothers were single than expected ($Z = -3.83$, $p = .$

002). The main effect of maltreatment group on child working memory was non-significant, $F(3, 204) = 1.34, p = .26$.

Furthermore, because the EVT-2 was administered after 83 of the maltreating families in the full sample ($n = 67$ of the maltreating families included in the current analysis) were randomly assigned to receive an intervention as part of the larger randomized clinical trial that is not of current interest, possible effects of the intervention on maltreated children's expressive language abilities were examined with a 2 (Intervention: control, intervention) by 3 (Maltreatment group: abused, neglected, emotionally maltreated) ANOVA. The main effect of the intervention, $F(1, 128) = 0.08, p = .78$, and the interaction of the intervention and maltreatment group, $F(2, 128) = 0.77, p = .47$, were not significant. Whether maltreated children received the intervention was not included as a covariate in the substantive analyses.

Means and standard deviations for the number of specific autobiographical memories recalled and the maternal elaborative quantity and affective quality variables are provided in Table 2. On average, children provided between four to five specific autobiographical memories during the AMT-PV. The total number of specific autobiographical memories provided was not significantly skewed, $z_{\text{skew}} = 1.05, p = .29$. Correlations among the primary study variables are provided in Table 3. The correlation analyses revealed that neglect was negatively associated with children's AMS and several of the maternal elaborative quantity and affective quality variables. Emotional maltreatment was negatively associated with maternal yes or no questions and elaborations, but was not significantly associated with child AMS. Abuse was not significantly associated with any of the maternal reminiscing variables or child AMS. There were significant intercorrelations among the four elaborative quantity variables ($r_s = .20-.59, p_s < .01$). Similarly, there were significant intercorrelations among the seven maternal affective quality variables ($r_s = .27-.82, p_s < .001$). Many, but not all, of the elaborative quantity and affective quality variables were correlated ($r_s = -.01-.39, p_s = .92-.001$).

Two composite variables were created to test hypotheses regarding associations among maltreatment group, maternal reminiscing, and children's AMS. The four maternal elaborative quantity variables (non-repetitive wh- questions, yes or no questions, elaborations, and confirmations) were summed to form the maternal elaborative quantity composite, which had adequate internal consistency ($\alpha = .70$). The distribution of the maternal elaborative quantity composite did not significantly deviate from normality per recommendations that z -scores less than 2.58 in samples including more than 200 participants likely do not violate normality ($z_{\text{skew}} = 2.21$; Field, 2013) and a non-significant Kolmogorov-Smirnov test, $D(208) = .05, p = .20$. The maternal affective quality variables were averaged to form the maternal affective quality composite, which had excellent internal consistency ($\alpha = .89$). The means and standard deviations for the elaborative quantity and affective quality composites by maltreatment group are provided in Table 2. The remaining analyses were conducted with the elaborative quantity and affective quality composite variables. The two composites were moderately correlated, $r = 0.41, p < .001$. Maternal affective quality, but not maternal elaborative quantity, was positively associated with AMS, $r = .19, p < .01$; $r = .11, p = .13$, respectively.

Main Analyses

The following analyses controlled for demographic differences among the abused, neglected, emotionally maltreated, and nonmaltreated groups (i.e., child language and maternal marital status). Child language was significantly associated with maternal elaborative quantity ($r = .26, p < .001$), maternal affective quality ($r = .28, p = .001$), and child AMS ($r = .32, p < .001$). Maternal marital status was also included as a covariate because married mothers were higher in elaborative quantity than single mothers ($r = .16, p = .02$) and more nonmaltreating than maltreating mothers were married. In addition, although children's working memory abilities did not significantly differ by maltreatment group, working memory was included as a covariate in the following analyses because working memory was positively associated with AMS ($r = .23, p = .001$), maternal elaborative quantity ($r = .16, p = .02$), and the affective quality of maternal reminiscing ($r = .23, p = .001$). Child sex did not significantly differ by maltreatment group (Table 1) and was non-significantly associated with child AMS, maternal elaborative quantity, and maternal affective quality ($ps > .26$). Child sex was not included as a covariate.

To address our first hypothesis, a 4 (Maltreatment group: nonmaltreated, abused, neglected, emotionally maltreated) by 2 (AMT-PV cue valence: positive, negative) ANCOVA with repeated measures on the last factor was conducted on the number of specific autobiographical memories recalled. Cue valence was included as a factor in this model because previous research has sometimes found a significant effect of cue valence on AMS (see Griffith et al., 2012). Child age was significantly and positively associated with child AMS ($r = .42, p < .001$) and was included as a covariate along with child language, child working memory, and maternal marital status. The results of the ANCOVA revealed a significant main effect of maltreatment group, $F(3, 200) = 2.98, p = .03, \eta_p^2 = .04$. The main effect of cue valence and the interaction of maltreatment group and cue valence were not significant, $F(1, 200) = 0.75, p = .39$; $F(3, 200) = 0.57, p = .63$, respectively. Post hoc simple contrasts with nonmaltreated children as the reference group showed that neglected children provided significantly fewer specific autobiographical memories compared with nonmaltreated children, $t(150) = -2.36, p = .02, r = -.19$. However, abused, $t(96) = 0.16, p = .87, r = .02$, and emotionally maltreated children, $t(104) = 0.47, p = .64, r = .05$, did not significantly differ from nonmaltreated children on AMS.

Next, we examined whether mothers of abused, neglected, and emotionally maltreated children differed from nonmaltreating mothers in the elaborative quantity and affective quality of their reminiscing when controlling for child age, language, working memory, and maternal marital status. The ANCOVA evaluating maternal elaborative quantity by maltreatment group revealed a significant main effect of maltreatment group on maternal elaborative quantity, $F(3, 200) = 3.39, p = .02, \eta_p^2 = .05$. Simple contrasts with nonmaltreating mothers as the reference group showed that mothers of neglected children were significantly lower in maternal elaborative quantity compared with mothers from nonmaltreating families, $t(150) = -2.49, p = .01, r = -.20$. The simple contrast for mothers of emotionally maltreated children was trending towards significance, $t(104) = -1.75, p = .08, r = -.17$, and was non-significant for mothers of abused children, $t(96) = 0.57, p = .57, r$

= .06. A third ANCOVA on the quality of maternal reminiscing revealed a non-significant main effect of maltreatment group, $F(3, 200) = 1.85, p = .14$.

Moderated Mediation Model

A moderated mediation analysis was conducted with the SPSS PROCESS macro (Hayes, 2013, 2015) to evaluate the hypothesis set forth by the developmental psychopathology model of OGM that impoverished maternal reminiscing among maltreating families mediates the association between maltreatment and reduced AMS (Valentino, 2011). Although we hypothesized that all maltreatment subtypes would be significantly associated with reduced AMS (hypothesis 1), we continued our analysis using data from the nonmaltreating ($n = 74$) and neglecting families ($n = 78$) only because the former analyses revealed that neglect, but not abuse nor emotionally maltreatment, was significantly and negatively associated with child AMS. This approach is consistent with previous studies examining potential mediators of the sequelae of maltreatment with subtype analyses (Teisl & Cicchetti, 2008; Valentino et al., 2009). In addition, because the aforementioned analyses revealed that the elaborative quantity, but not the affective quality of maternal reminiscing differed by maltreatment group, the a priori moderated mediation model (hypothesis 3) was adjusted to include maternal elaborative quantity as the mediator and the affective quality of maternal reminiscing as a moderator of the association between maternal elaborative quantity and child AMS. Similar to the a priori hypothesis, neglect was anticipated to be negatively associated with the quantity of maternal elaborations, which was expected to be positively associated with AMS when maternal affective quality was high.

In the following model, the total number of specific autobiographical memories was regressed onto neglect, which was coded as nonmaltreated (0) or neglected (1). Maternal elaborative quantity was entered as a mediator of this direct effect. Maternal affective quality was entered as a moderator of the association between maternal elaborative quantity and child AMS. Child age, language, working memory, and maternal marital status were included as covariates on maternal elaborative quantity and child AMS. Following procedures outlined by Hayes (2015), we constructed an index of moderated mediation, which indicates whether the indirect effect of neglect on AMS through maternal elaborative quantity is a linear function of maternal affective quality, by using 5,000 resamples to construct a bias-corrected bootstrap 95% confidence interval around the conditional indirect effect. Continuous covariates and predictors were mean centered prior to being entered into the model.

See Figure 1 for a path diagram of the model using unstandardized regression coefficients. The number of specific memories recalled increased as child age ($b = 1.15, SE = 0.20, p < .001$) and expressive language abilities increased ($b = 0.06, SE = 0.02, p < .01$). Child working memory ($b = 0.10, SE = 0.08, p = .24$) and maternal marital status ($b = -0.93, SE = 0.52, p = .08$) were non-significantly associated with child AMS. Neglect was significantly and negatively associated with maternal elaborative quantity, $b = -0.71, SE = 0.29, p = .02$. Child age ($b = -0.24, SE = 0.25, p = .33$), language ($b = 0.05, SE = 0.03, p = .06$), working memory ($b = 0.09, SE = 0.11, p = .37$), and maternal marital status ($b = 0.84, SE = 0.66, p = .20$) were not significantly associated with maternal elaborative quantity. The elaborative

quantity ($b = 0.06$, $SE = 0.07$, $p = .42$) and affective quality of maternal reminiscing ($b = 0.06$, $SE = 0.26$, $p = .82$) were non-significantly associated with child AMS. However, the interaction of the elaborative quantity and affective quality of maternal reminiscing was significantly associated with child AMS, $b = 0.15$, $SE = 0.07$, $p = .03$. The direct effect of neglect on child AMS was significant, $b = -0.47$, $SE = 0.23$, $p = .047$, 95% CI $[-0.930, -0.006]$. The 95% bootstrap confidence interval indexing moderated mediation of our path analysis did not include zero $[-0.299, -0.009]$, indicating that there was a significant indirect effect of neglect on child AMS through maternal elaborative quantity, but that the strength of this indirect effect was contingent on the affective quality of maternal reminiscing.

To explicate the nature of the conditional indirect effect, 5,000 resamples were used to construct bias-corrected bootstrap 95% confidence intervals around the indirect effect at one standard deviation below the mean, at the mean, and one standard deviation above the mean of maternal affective quality. When mothers were low in affective quality (one standard deviation below the mean), maternal elaborative quantity did not mediate the association between neglect and child AMS, $b = 0.06$, $SE = 0.08$, 95% CI $[-0.050, 0.281]$. In addition, the indirect effect was not significant at the mean of maternal affective quality, $b = -0.04$, $SE = 0.06$, 95% CI $[-0.200, 0.051]$. However, when mothers were high in maternal affective quality (one standard deviation above the mean), maternal elaborative quantity significantly mediated the association between neglect and child AMS, $b = -0.14$, $SE = 0.10$, 95% CI $[-0.421, -0.003]$.

In a separate model, the region of significance for which maternal elaborative quantity was associated with child AMS at various levels of maternal affective quality was identified using the Johnson-Neyman technique (Preacher, Rucker, & Hayes, 2007). This was done to further explicate the nature of the interaction between the elaborative quantity and affective quality of maternal reminiscing, controlling for neglect, child age, language, working memory, and maternal marital status. Maternal elaborative quantity was significantly and positively associated with child AMS when the affective quality of maternal reminiscing was approximately one standard deviation above the mean or higher, $b = 0.21$, $SE = 0.10$, $p = .047$, 95% CI $[0.003, 0.415]$.

Discussion

The findings from the current investigation extend the extant literature and theoretical models of AMS in several critical ways. The findings provide initial empirical evidence that reduced AMS emerges as early as the preschool years among some maltreated children. Specifically, neglected preschoolers were observed to have reduced AMS, as opposed to abused or emotionally maltreated preschoolers, compared with their demographically similar nonmaltreated peers. A complementary novel observation in the current study was that mothers of neglected, but not abused nor emotionally maltreated children, rehearsed and elaborated upon memories to a lesser extent when reminiscing with their children than nonmaltreating mothers. Both of these findings were independent of children's age, language, working memory, and maternal marital status. The effects were small to moderate in size. Within the sociocultural and developmental psychopathology perspectives of

autobiographical memory development (Nelson & Fivush, 2004; Valentino, 2011), which identify maternal reminiscing as a central mechanism for fostering preschoolers' autobiographical memory, these findings collectively suggests that reminiscing among neglecting families may not serve to bolster preschoolers' AMS to the same extent that reminiscing serves these purposes among nonmaltreating families.

This interpretation is further corroborated by evidence of an indirect pathway from neglect to reduced AMS through the quantity of maternal elaborations when the affective quality of maternal reminiscing was high. That is, the extent to which maternal reminiscing serves to consolidate and strengthen memory traces via elaborations was identified to facilitate preschoolers' abilities to retrieve specific autobiographical memories, but only when mothers reminisced in an emotionally coherent and sensitive manner. The observed additive effect of maternal elaborative quantity and affective quality in promoting preschoolers' AMS is consistent with a self-determination perspective of maternal reminiscing (Cleveland & Morris, 2014; Cleveland & Reese, 2005) and previous research on children's autobiographical memory (Cleveland & Reese, 2005; McDonnell et al., 2016; Principe et al., 2017). Given that the association between maternal elaborative quantity and children's AMS was identified to depend on the quality of maternal reminiscing, the indirect effect of neglect on reduced AMS through impoverished maternal elaborative quantity was moderated by maternal affective quality. The findings from this model are particularly important for informing theoretical perspectives of AMS and provide initial empirical support for the mediating role of maternal reminiscing in the association between neglect and reduced AMS (Salmon & Reese, 2015; Valentino, 2011).

The observed impoverished elaborative quantity among mothers of neglected, but not abused nor emotionally maltreated children is consistent with the broader patterns of parental behaviors that distinguish these groups. Parental disengagement characterized by inattentive and unresponsive behaviors better distinguishes neglecting from nonmaltreating parents than physically abusive from nonmaltreating parents (Wilson et al., 2008). This effect is particularly strong when parents are provided minimal task-specific instructions for interacting with their children, much like the reminiscing task in the current investigation. Impoverished elaborations among mothers of neglected children likely reflects the general disinterested disposition of neglecting parents. In addition, although unpredictable, dangerous, and aversive behaviors are a distinguishing characteristic of physically abusive parents (Wilson et al., 2008), there may be periods when physically abusive parents express relatively high levels of positive regard towards their children (i.e., warm verbal and physical interactions; Okado & Haskett, 2015).

Furthermore, given that emotional maltreatment was distinct from physical neglect and included instances of witnessing domestic violence in the current investigation, mothers of emotionally maltreated children in the current study may have engaged in sporadic violent behaviors that were not necessarily targeted towards their children. The discord resulting from interparental violence has been linked with hostile parenting, but has also been associated with improvements in maternal parenting, likely in attempt to compensate for the violence that ensued (Levendosky & Graham-Bermann, 2001). Mothers of emotionally maltreated children did not significantly differ from nonmaltreating mothers in the quantity

of maternal elaborations when controlling for demographic variables, but this finding was trending towards significance and the effect size was small to moderate. Future exploration of maternal elaborative reminiscing among mothers of emotionally maltreated children is warranted.

In addition, small to moderate negative correlations between neglect and several aspects of maternal affective quality (i.e., maternal acceptance, involvement, structuring, coherence, and overall adequacy) were observed, but these associations may be statistically accounted for by demographic differences among the maltreatment groups. The hypothesis that mothers of abused, neglected, and emotionally maltreated children would be lower in their affective quality than nonmaltreating mothers was not supported when controlling for child age, language, working memory, and maternal marital status. This finding highlights the at-risk nature of maternal affective quality among high-risk families. Mothers were moderately engaged in the behaviors identified to comprise a high quality of maternal sensitive guidance, on average.

Notwithstanding the novelty and theoretical significance of the current findings, future research that addresses limitations of the present investigation may further elucidate the current observations and advance theoretical models of OGM. First, the maltreating families were recruited to reflect the general distribution of maltreatment subtypes in the United States. Families where children have been physically or sexually abused were not oversampled. Our ability to detect significant differences among abusive families may have been reduced given the number of abusive families in the study. Previous empirical and theoretical work emphasizes abuse as a central contributor to reduced AMS (Valentino et al., 2009; Williams, 1996). For example, Valentino and colleagues (2009) demonstrated that abused 7- to 13-year-olds provided significantly more OGMs relative to their nonmaltreated and physically neglected peers.

However, according to a functional avoidance perspective of OGM, the adoption of an overgeneralized retrieval strategy as an avoidant emotion-regulation process is postulated to emerge gradually after exposure to trauma (Williams et al., 2007). The developmental timing and progression of this process in relation to the timing of trauma has yet to be identified. Perhaps during the preschool years, when trauma has occurred relatively recently given the age of the child, such avoidant approaches may have yet to be fully integrated into the general mnemonic strategies of abused children. It is noteworthy that the children in the current investigation were considerably younger than the child participants included in previous research regarding AMS in trauma-exposed youth (e.g., adolescence; see Hitchcock et al., 2014; Stewart et al., 2017 for reviews) and their maltreatment experiences occurred within one year of the AMS assessment for the majority of the children.

In addition, because neglect tends to be a chronic omission of basic caregiving characterized by uninvolved parenting and parental indifference rather than the commission of trauma (such as physical or sexual abuse), neglected children may not have experienced incident-specific trauma that would motivate the adoption of an overgeneralized memory retrieval strategy based on avoidance. Future prospective longitudinal studies evaluating associations among abuse, neglect, emotional maltreatment, and AMS over time are needed to explicate

the emergence of a functional avoidance mnemonic strategy as children age and the cognitive and the socioemotional sequelae of childhood maltreatment progresses. Prospective longitudinal investigations would also be valuable in identifying trajectories of AMS among children with a variety of maltreatment experiences and may elucidate the current findings within a functional avoidance framework.

Additional directions for future research include examining whether associations between maternal behaviors during reminiscing and child AMS are unique to the reminiscing context or are reflective of broader associations between maternal sensitivity and child development. Although mother-child reminiscing provides a window into the dyads interpersonal relationship (Koren-Karie et al., 2003, 2008), mother-child reminiscing is postulated to be a distinct mother-child interaction for facilitating children's autobiographical memory given the inherent emphasis on using language to narrate, interpret, and evaluate past experiences (Fivush, 2011; Nelson & Fivush, 2004). The bolstering effects of discourse between mothers and their children on children's narrative and language abilities have been identified as unique to the reminiscing context. For example, maternal use of elaborations during reminiscing, but not during a dyadic book reading, facilitates preschoolers' independent narrative abilities (Reese, Leyva, Sparks, & Grolnick, 2010) and phonological awareness (Leyva, Sparks, & Reese, 2012). Future research examining associations between maternal behaviors in non-reminiscing contexts (e.g., free play), maternal reminiscing, and children's cognitive and psychological functioning among high-risk families can elucidate the uniqueness of mother-child reminiscing as an activity for fostering development.

Furthermore, identifying whether reduced AMS among neglected preschoolers reflects an intergenerational transmission of reduced cognitive and socioemotional abilities from mothers to their children is a fruitful area for future research. Maltreating mothers may have experienced trauma during their own childhood that puts them at-risk for AMS, psychological, and socioemotional impairments (Cicchetti & Valentino, 2006). Indeed, one recent study has reported significant indirect effects of maternal AMS on child AMS through the affective quality of maternal reminiscing in a typically developing sample (Jobson et al., 2018). Investigations incorporating children's concurrent socioemotional (e.g., attachment security, emotional knowledge) and psychological functioning (e.g., depressive symptomology) would also be valuable in advancing theoretical accounts of AMS. Such investigations among maltreated children would be especially informative given observed socioemotional and psychological deficits among abused and neglected children (Cicchetti & Valentino, 2006). Identifying whether maternal reminiscing is associated with reduced AMS among neglected children via impoverished self-representations should be an additional research priority. Neglected preschoolers have been observed to have impairments in their self-representations (Toth et al., 2000). An indirect effect of maternal affective quality on preschoolers' AMS through positive self-representations has been observed among typically developing families (Valentino et al., 2014).

Prospective longitudinal investigations will be necessary to elucidate whether certain risk and protective factors may be more prominent in influencing AMS at different developmental stages. For example, as neglected children begin to interact with individuals outside of their homes on a more consistent basis (e.g., teachers), conversations occurring

outside of the mother-child dyad may supplement their autobiographical memory development (Neale & Pino-Pasternak, 2017). Associations between maternal reminiscing and child AMS have yet to be evaluated beyond the preschool years.

The findings from the current study have important methodological implications. A substantial minority of children in the current investigation did not engage in the AMT-PV. Although the ability to recount specific autobiographical memories emerges during the third year of life (Fivush, 2011), developmental delays among our high-risk sample may have precluded young children's abilities to engage in the task. This notion is supported by the observation that the majority of disengaged children were 3-years-old and that the disengaged children had significantly lower expressive language abilities compared with children who were able to engage in the task. Given that research using AMT cue word paradigms among preschoolers is in its infancy, research identifying additional predictors of disengagement could contribute to methodological advancements. For example, future research should determine whether children's understanding of the cue words (outside of administration of the AMT-PV) is associated with children's abilities to engage in the task.

The current observations provide additional empirical support for the potential utility of reminiscing-based interventions aimed to bolster cognitive and psychological functioning among neglected children (also see Valentino et al., 2015). Although future prospective longitudinal research is needed to confirm the directionality of the observed associations, the cross-sectional evidence suggests that the extent to which maternal reminiscing facilitates (1) children's mnemonic competencies, by providing opportunities for children to rehearse event details and to practice retrieving memories, and (2) children's autobiography, by enhancing children's understanding of emotional experiences and by fostering connections between previous events to the self via coherent and affectively consistent reminiscing, are both critical to preschooler's abilities to independently recall specific autobiographical memories. Thus, training mothers to adopt a reminiscing style that incorporates wh-questions, yes or no questions, confirmations, and elaborations in a coherent manner that is sensitive and supportive of their children's emotional expressions may facilitate preschoolers' AMS, especially among neglecting families. Maternal use of elaborations and sensitive guidance during reminiscing are adaptable behaviors that have been improved with brief training procedures among mothers from typically developing (Cleveland & Morris, 2014; Van Bergen et al., 2009) and maltreating families (Valentino, Comas, Nuttall, & Thomas, 2013).

Training programs that incorporate elements aimed to enhance both maternal elaborative quantity and affective quality will be necessary given that the degree to which mothers rehearse and elaborate upon details was observed as being distinguishable albeit moderately associated with maternal sensitive guidance. Complete independence of these dimensions likely was not established given the extensive range of behaviors captured by the maternal affective quality measure in the current investigation (e.g., coherence, scaffolding). Future factor structure analyses on these dimensions would be informative. Given replicable associations between OGM and psychopathology (Hitchcock et al., 2014; Williams et al., 2007), training mothers of neglected children to reminisce in an elaborative and emotionally

supportive manner may decrease OGM and risk for psychopathology among neglected preschoolers.

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Figure 1.

Moderated mediation model of the conditional indirect effect of neglect on reduced AMS through maternal elaborative quantity by maternal affective quality. Path coefficients are unstandardized. Dashed lines indicate associations with control variables.

$^\dagger < .10$

$^* p < .05$

$^{**} p < .01$

$^{***} p < .001$

Table 1

Sample Characteristics by Maltreatment Subtype

Variable	Nonmaltreated (<i>n</i> = 74)		Abused (<i>n</i> = 24)		Neglected (<i>n</i> = 78)		Emotionally Maltreated (<i>n</i> = 32)		Overall (<i>N</i> = 208)	
	<i>M</i> (SD)	%	<i>M</i> (SD)	%	<i>M</i> (SD)	%	<i>M</i> (SD)	%	<i>M</i> (SD)	%
Maternal age	30.24(6.60)		30.86(5.66)		29.06(4.49)		30.50(6.71)		29.91(5.80)	
Child age	4.94(1.10)		5.26(1.18)		4.88(1.14)		5.22(1.04)		5.00(1.11)	
Child sex (Male)		47.3		54.2		46.2		37.5		46.2
Child ethnicity										
African American		41.9		58.3		35.9		43.7		41.8
Caucasian		18.9		29.2		33.3		21.9		26.0
Hispanic/Other		39.2		12.5		30.8		34.4		32.2
Income (\$12,000/year)		51.4		54.2		52.6		75.0		55.8
Maternal education										
Some high school		23.0		33.3		37.2		15.6		28.4
High school/GED		27.0		29.2		34.6		46.9		33.2
Some trade/college		32.4		20.8		20.5		28.1		26.0
Trade/college		14.9		16.7		6.4		9.4		11.0
Masters		2.7		0.0		1.3		0.0		1.4
Marital Status (Single) *		64.9		91.7		85.9		87.5		79.3
Language										
Maternal	86.49(12.13)		84.29(10.96)		83.96(14.01)		86.28(12.49)		85.25(12.77)	
Child *	96.48(11.36)		92.34(9.50)		89.21(10.79)		93.63(8.87)		92.84(10.98)	
KABC-II number recall	9.69(2.92)		9.50(2.09)		8.99(2.74)		8.69(3.12)		9.25(2.81)	

Note. KABC-II = Kaufman Assessment Battery for Children, 2nd edition (Kaufman & Kaufman, 2004).

* $p < .01$.

Table 2

Means and Standard Deviations of Maternal Reminiscing and Child AMS by Maltreatment Subtype

	Nonmaltreated (<i>n</i> = 74)	Abused (<i>n</i> = 24)	Neglected (<i>n</i> = 78)	Emotionally Maltreated (<i>n</i> = 32)	Overall (<i>N</i> = 208)
Maternal elaborative quantity					
Wh- questions	2.91 (1.22)	3.14 (0.92)	2.51 (1.07)	2.55 (1.34)	2.73 (1.17)
Yes/no questions	4.29 (1.42)	4.24 (1.40)	3.70 (1.16)	3.65 (1.15)	3.96 (1.31)
Elaborative statements	3.90 (1.42)	3.74 (1.28)	3.34 (1.32)	3.29 (1.43)	3.58 (1.39)
Confirmations	1.29 (0.96)	1.19 (0.78)	0.79 (0.80)	1.16 (0.94)	1.07 (0.90)
Quantity composite $\bar{r}$	12.37 (3.57)	12.31 (3.32)	10.35 (3.22)*	10.64 (3.34)	11.34 (3.49)
Maternal affective quality					
Focus on task	6.11 (1.08)	6.08 (1.06)	6.09 (1.11)	6.13 (1.34)	6.10 (1.12)
Acceptance/Tolerance	5.66 (1.21)	5.42 (1.21)	5.00 (1.24)	5.25 (1.32)	5.32 (1.26)
Involvement/Reciprocity	5.53 (1.32)	5.83 (1.27)	5.08 (1.40)	5.31 (1.55)	5.36 (1.40)
Closure of negative feelings	4.26 (0.89)	4.38 (0.92)	4.06 (0.96)	4.41 (0.71)	4.22 (0.90)
Structuring	5.27 (1.39)	5.29 (1.20)	4.72 (1.25)	4.94 (1.50)	5.01 (1.35)
Overall adequacy	5.73 (1.46)	5.92 (1.50)	5.09 (1.20)	5.34 (1.45)	5.45 (1.40)
Overall coherence	4.74 (1.56)	5.00 (1.38)	3.99 (1.30)	4.50 (1.57)	4.45 (1.49)
Quality composite	5.33 (1.00)	5.42 (0.96)	4.86 (0.90)	5.13 (1.08)	5.13 (0.99)
Child memory specificity					
Positive cues	2.27 (1.57)	2.54 (1.35)	1.44 (1.65)	2.63 (1.52)	2.04 (1.63)
Negative cues	2.42 (1.75)	2.50 (1.47)	1.73 (1.75)	2.53 (1.67)	2.19 (1.73)
Total $\bar{r}$	4.69 (3.07)	5.04 (2.61)	3.17 (3.09)*	5.16 (2.80)	4.23 (3.09)

Note. Values for individual maternal elaborative quantity variables are square-root transformed.

$\bar{r}$ main effect of maltreatment group.

* significantly different from nonmaltreated group at $p < .05$.

Table 3
Bivariate Associations among Primary Study Variables and Maltreatment Subtype

	Abused	Neglected	EM	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Maternal elaborative quantity																		
1. Wh- questions	.09	-.17*	-.13	—														
2. Yes/No questions	-.01	-.22**	-.21*	.33***	—													
3. Elaborations	-.05	-.20*	-.20*	.31***	.59***	—												
4. Confirmations	-.05	-.27***	-.06	.20**	.30***	.41***	—											
Maternal affective quality																		
5. Focus on task	-.01	-.01	.01	-.03	-.03	-.01	.05	—										
6. Acceptance/Tolerance	-.09	-.26***	-.15	.31**	.36***	.30***	.26***	.40***	—									
7. Involvement/Reciprocity	.10	-.16*	-.07	.27**	.39***	.34***	.20**	.45***	.68***	—								
8. Closure of negative feelings	.06	-.10	.08	.09	.14*	.08	.12†	.27**	.40***	.36***	—							
9. Structuring	.01	-.21*	-.11	.33***	.31***	.36***	.27***	.46***	.62***	.74***	.38***	—						
10. Overall adequacy	.06	-.24**	-.12	.26***	.18**	.31***	.31***	.41***	.47***	.55***	.29***	.67***	—					
11. Overall coherence	.07	-.26***	-.07	.21***	.19**	.30***	.33***	.48***	.55***	.64***	.37***	.75***	.82***	—				
Child variables																		
12. Total specific memories	.05	-.24**	.07	.12†	-.06	.10	.18**	.10	.06	.07	.06	.10	.30***	.28***	—			
13. Working memory	-.03	-.13	-.15	.11	.06	.22**	.05	.08	.16*	.21**	.09	.27***	.19**	.23***	.23***	—		
14. Expressive language	-.16	-.31***	-.12	.19**	.20**	.22**	.14†	.12†	.25***	.27***	.13†	.27***	.21**	.25***	.32***	.39***	—	
15. Age	.13	-.03	.12	.13†	-.24**	-.06	.09	.03	.01	.01	-.03	.08	.17*	.21**	.42***	.15*	.02	
Maternal marital status	-.26*	-.25***	-.23*	.15*	.15*	.03	.17*	.02	.28***	.14*	-.01	.14*	.04	.04	-.05	.10	.19**	.02

Note. EM = emotionally maltreated. For abused, neglected, and EM columns, point biserial correlations are presented with the nonmaltreated group as the reference. $n = 98$ for abused column, $n = 152$ for neglected column, $n = 106$ for EM column. $N = 208$ (entire sample) for columns 1–15.

100' > *p* ***
'10' > *p* **
'05' > *p* *
'10' > *p* †

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