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## Autobiographical memory functioning among abused, neglected, and nonmaltreated children: The overgeneral memory effect

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### Abstract

**Background**—This investigation addresses whether there are differences in the form and content of autobiographical memory recall as a function of maltreatment, and examines the roles of self-system functioning and psychopathology in autobiographical memory processes.

**Methods**—Autobiographical memory for positive and negative nontraumatic events was evaluated among abused, neglected, and nonmaltreated school-aged children.

**Results**—Abused children's memories were more overgeneral and contained more negative self-representations than did those of the nonmaltreated children. Negative self-representations and depression were significantly related to overgeneral memory, but did not mediate the relation between abuse and overgeneral memory.

**Conclusions**—The meaning of these findings for models of memory and for the development of overgenerality is emphasized. Moreover, the clinical implications of the current research are discussed.

### Keywords

child abuse; maltreatment; autobiographical memory; overgeneral memory; self-representations; depression

### Introduction

Autobiographical memory research among adults who report childhood trauma suggests that childhood maltreatment may be associated with difficulty in recollecting specific autobiographical memories in response to cue words, a phenomenon known as the *overgeneral memory effect* (e.g., Henderson, Hargreaves, Gregory, & Williams, 2002; Kuyken & Brewin, 1995). Moreover, research with adults and adolescents has supported a clear association between depression and overgeneral memory (OGM), (see Williams et al., 2007 for review). When compared to control participants, depressed or suicidal adults consistently demonstrate a tendency to recall OGMs, that is, memories referring to repeated events (e.g., every Sunday when I go to church...), or referring to events that lasted for a

longer period of time (e.g., the time I lived in London), rather than recalling specific episodes in their personal past.

OGM has high clinical relevance because overgenerality is predictive of delayed recovery from episodes of affective disorders (e.g., Brittlebank, Scott, Williams, & Ferrier, 1996; Dalgleish, Spinks, Yiend, & Kuyken, 2001). Moreover, memory remains overgeneral in those with a history of emotional disorder, even when they are not currently in an episode (e.g., Mackinger, Pachinger, Liebetseider & Faracek, 2000). Therefore, OGM might serve as a marker for future vulnerability for depression. In fact, there is evidence that OGM when one is not depressed predicts later depressive symptomatology (e.g., Gibbs & Rude, 2004; Mackinger et al., 2000).

Perhaps the most widely stated theory of OGM is that of Williams (1996), who hypothesized that children who experience early trauma/adversity adopt a generic style in retrieving autobiographical memories as an affect-regulating strategy. Williams asserted that memory retrieval is truncated at an intermediate, overgeneral stage, and this process is reinforced through the avoidance of negative affect attached to painful memories.

Although trauma exposure is hypothesized to be critical in the development of OGM, a review of the extant literature reveals limited and inconsistent empirical evidence (Moore & Zoellner, 2007). Some studies have demonstrated that child trauma is associated with difficulty in specific memory retrieval in adulthood over and above the effects of depression (DeDecker, Hermans, Raes, & Eelen et al., 2003; Henderson et al., 2002; Kuyken & Brewin, 1995). In contrast, others have reported a null effect of maltreatment on OGM (Orbach, Lamb, Sternberg, Williams, & Dawud-Noursi, 2001; Wessel, Meeren, Peeters, Arntz, & Merchelbach, 2001), while another study found that depressed adolescents with a history of trauma retrieved fewer OGMs than depressed adolescents without a trauma history (Kuyken, Howell, & Dalgleish, 2006). The fact that all studies relied on retrospective reports of child abuse to assess trauma most likely contributed to the lack of consistency in findings. This raises questions about the accuracy of retrospective reports in the absence of additional, more objective measures of trauma (Widom, 1989). Thus, in order to address a significant gap in the literature regarding the relation between childhood trauma and autobiographical memory, research conducted among samples of maltreated children is necessary.

Researchers have just begun to investigate autobiographical memory functioning for non-trauma-related stimuli with maltreated children and adolescents (e.g., DeDecker et al., 2003; Johnson, Greenhoot, Glisky, & McCloskey, 2005). For example, an investigation by Johnson and colleagues (2005) revealed that recent family violence was associated with OGMs. However, OGM was more consistently related to current circumstances (e.g., domestic violence) than to self-reported childhood abuse history. Depression in this sample also was related to OGM, and it was unclear whether depression was a result, cause, or correlate of this pattern of memory recall. Therefore, it is unclear how abuse and/or psychopathology might account for OGM effects. In addition, this investigation found that older children recalled fewer specific memories than younger children, a pattern of results that is opposite to findings among nonmaltreated children with and without depression (Drummond, Astell, O'Carroll, & Dalgleish, 2006). Therefore, developmental issues about OGM among maltreated children remain unclear.

More recent models of autobiographical memory and overgenerality propose additional explanations for reduced autobiographical memory specificity, highlighting the role of self-representations and executive control in autobiographical memory retrieval (Conway & Pleydell-Pearce, 2000). Consistent with earlier models of autobiographical memory (e.g., Burgess & Shallice, 1996), retrieval is conceptualized as a top down process whereby

general descriptions are activated early and become index points for the retrieval of the specific event. Conway and Pleydell-Pearce (2000) add that retrieval requires supervisory executive processes to progressively refine the pattern of activation and to inhibit irrelevant information. In addition, this model emphasizes that many of the intermediate descriptions used to aid in the retrieval of autobiographical memory are conceptually based self-representations, including self-referential attributes and/or abstracted representations of generic aspects of the self and experience. Although this predominance of conceptual self-relevant information in the early stages of memory search typically facilitates autobiographical memory retrieval, there is some evidence that individuals who possess highly activated emotion-related self-representations are at risk for OGM retrieval. For example, Williams and colleagues (2007) posit that individuals who are depressed represent a group in whom emotion-related conceptual self-representations are in a heightened state of activation. Rather than aiding the memory search, this may result in individuals becoming “captured” at the level of negative self-representation, resulting in difficulties in retrieving specific autobiographical memories. Therefore, Williams and colleagues’ (2007) updated model of OGM integrates elements of Conway & Pleydell-Pearce’s model with William’s (1996) theory by adding that capture and rumination and impaired executive control might also contribute to OGM.

There is a growing body of evidence to support Williams and colleagues 2007 model of OGM. For example there is empirical evidence for the role of impaired executive control in OGM retrieval (Dalgleish et al., 2007; Dalgleish, Rolfe, Golden, Dunn, & Barnard, 2008). Dalgleish and colleagues (2007) demonstrated that verbal fluency mediated the relationship between depressed mood and autobiographical memory specificity. In contrast, research among trauma exposed participants supports the affect-regulation account with greater posttraumatic stress, rather than executive control, being associated with reduced memory specificity (Dalgleish et al., 2008).

Regarding the relation between self-representations and OGM, two prior investigations have examined this issue (Crane, Barnhofer, & Williams, 2007; Spinhoven, Bocking, Kremers, Schene, & Williams, 2007). In both studies, specificity of autobiographical memory recall was reduced when dysfunctional or negative aspects of previously depressed participants’ self-representations were activated during the memory retrieval task. Such evidence provides support for Williams’ notion of ‘capture’ at the level of self-representations during autobiographical memory retrieval, at least among adults with a history of depression. Similarly, memory research among maltreated children has demonstrated that activation of children’s maternal representations during a memory task may lead to impairments in semantic memory recall for children who have been abused (Valentino, Cicchetti, Rogosch, & Toth, 2008). No investigations to date have directly examined the relation between negative self-representation and OGM among children, nor has the role of maternal-representations in OGM been addressed. Because maltreated children are at risk for a number of impairments in self-system functioning, including the development of negative self- and maternal-representations, and depression, the centrality of children’s representations to the retrieval of autobiographical memory is particularly relevant to our understanding of this process among maltreated children.

Deviations in normative self-system development and functioning are among the most well documented sequelae of child maltreatment (see Cicchetti & Valentino, 2006, for review). Examination of children’s narratives reveals that maltreated preschoolers have more negative representations of the self and of their caregivers than do nonmaltreated preschoolers (Toth, Cicchetti, Macfie & Emde, 1997; Toth, Cicchetti, Macfie, Maughan & Vanmeenan, 2000). Specifically, the narratives of physically abused children demonstrated the most negative maternal representations and the highest levels of negative self-

representations. In contrast, neglected children evidenced the lowest levels of positive self-representations (Toth et al., 1997). Given the extensive theoretical and empirical support for self-system impairments among maltreated children, and the critical role that the self plays in the organization of memory, it is important to assess how the experience of maltreatment might alter autobiographical memory for nontraumatic information. In particular, the affective valence of maltreated children's self- and maternal-representations may influence the encoding and retrieval of positive and negative life events. Furthermore, child maltreatment increases the risk for the development of depression, which is associated with alterations in autobiographical memory. Because abused and neglected children are at risk for the development of negative self-representations and depression, we anticipated that both groups would demonstrate overgeneral autobiographical memory given our hypothesis that self-representations and/or depression would mediate the relationship between maltreatment and OGM.

This investigation aimed to provide a comprehensive analysis of maltreated children's autobiographical memories by focusing on additional subgroups of maltreated children (physical abuse and neglect), and including more rigorous methods for assessing maltreatment experiences. Additionally, we aimed to evaluate the role of both self- and maternal-representations and depression in the relation between maltreatment and overgeneral memory. We expected that (1) abused and neglected children would demonstrate more OGMs than would the nonmaltreated children; (2) older children would demonstrate more OGM than would younger children; (3) negative self- and maternal-representations would mediate the relationship between maltreatment and OGM; and (4) depressive symptomatology would mediate the relationship between maltreatment and OGM.

## Research Design and Methods

### Participants

Participants consisted of 192 children (77 maltreated and 115 nonmaltreated) between 7 and 13 years of age (average age = 10.61, SD = 1.55). Maltreated children were recruited from those reported to the local Department of Human Services (DHS) because of concerns associated with child maltreatment. Low-SES nonmaltreated families were recruited from families receiving public assistance in the form of Temporary Assistance to Needy Families. All participating families provided informed consent and signed release forms granting access to their DHS records. The presence or absence of maltreatment was subsequently verified through extensive examinations of each family's case history and through maternal interview. Maltreatment Classification System (MCS; Barnett, Manly, & Cicchetti, 1993)

Rather than relying solely on DHS child protective agency designation, multi-informant reports of children's maltreatment experiences, as documented in child protective and preventive records, were coded using the well validated MCS (Barnett et al., 1993; Manly, Cicchetti, & Barnett, 1994). The MCS contains operational definitions of maltreatment subtypes which were utilized to determine the presence or absence of each subtype; multiple subtypes could be coded for each report.

Maltreatment subtype categories include sexual abuse, physical abuse, physical neglect, and emotional maltreatment. Sexual abuse is coded when any sexual contact or attempted sexual conduct occurred between the child and an adult. Physical abuse is determined by injuries that had been inflicted upon a child by nonaccidental means. Physical neglect is coded for failure of the primary caregiver to meet a child's needs for food, clothing, shelter, medical, dental, or mental health care, education, hygiene, or physical safety. Emotional maltreatment is coded for chronic or extreme neglect or disregard of children's emotional needs. (See

Barnett et al., 1993). Coding of DHS records was conducted by trained research assistants and Ph.D. level psychologists, among whom adequate reliability was established (weighted  $\kappa = .78-.94$ ).

The majority of maltreated participants (65%) in the current study experienced multiple forms of maltreatment, a finding that is consistent with prior work on maltreatment (e.g., Manly, Kim, Rogosch, & Cicchetti, 2001). Subsequently, maltreated children were assigned a primary subtype classification based upon a hierarchy that assesses the degree to which a particular experience of maltreatment violates social norms (Manly et al., 1994). Primary subtype classifications, in descending order of deviation from societal norms, are sexual abuse, physical abuse, neglect and emotional maltreatment. Consistent with several previous investigations, these primary subtype effects were further classified as abuse (e.g., sexual abuse and physical abuse) versus neglect (e.g. neglect), based on the knowledge that these experiences often exert differential effects on children's development (e.g., Smetana, Toth, Cicchetti, Bruce, Kane & Daddis, 1999; Valentino et al., 2008). Any child who experienced physical or sexual abuse, regardless of concomitant neglect or emotional maltreatment, was classified into the abused group ( $N = 36$ ), whereas the remaining maltreated children who experienced neglect ( $N = 34$ ) were placed in the neglected group. Children who experienced emotional maltreatment, but not any other form of maltreatment ( $N = 7$ ) were dropped from further analyses due to power limitations for analyses with this small subgroup.

Abusing, neglecting and nonmaltreating families did not differ on a number of important demographic characteristics (see Table 1). A significant difference emerged among groups regarding cognitive performance,  $F(2, 182) = 8.98, p < .001$ . Cognitive differences were controlled for in all subsequent analyses.

## Procedure

Data for the current investigation were collected during a research summer camp program designed to provide children from low socioeconomic status families a recreational experience in which maltreated and nonmaltreated children's behavior could be observed in an ecologically valid context. Children were assigned to same-age, same-sex groups of peers and were supervised by adult counselors who were unaware of the children's maltreatment status and of the research hypotheses. Children attended the summer camp for one of six weeks. During the program, children completed assessment measures individually with research staff.

## Measures

**Autobiographical Memory Test (AMT; Williams & Broadbent, 1986)**—The Autobiographical Memory Test (AMT) consists of 10 emotional cue words, five positive and five negative. The cues were simultaneously presented orally and visually in a fixed order, alternating positive and negative cues (i.e., happy, sorry, safe, angry, interested, clumsy, successful, hurt, surprised and lonely). Children were asked to generate a specific memory in response to each cue word (e.g. “*tell me about a time when you felt \_\_\_*”). Children were given 1 minute in each case to retrieve a specific personal memory in response to a cue word. If the child responded with a memory that was not specific, then he/she was prompted to do so. If the child did not retrieve a specific memory within 60 seconds, then the experimenter proceeded to the next item. The AMT was audiotaped, and all verbatim responses were transcribed.

**Peabody Picture Vocabulary Test (PPVT-R, PPVT-III; Dunn & Dunn, 1981, 1997)**—The PPVT-R and the PPVT-III are individually administered, multiple-choice tests designed to assess the receptive vocabulary skills. Different versions of the test were

administered because study participants were drawn from two separate time points. All PPVT-R scores were transformed into equivalent PPVT-III standard scores for analyses.

**Child Depression Inventory (CDI; Kovacs, 1981)**—The CDI contains 27 items that assess the cognitive, affective and behavioral sequelae of depression. Scores on the CDI may range from 0 to 54, with higher scores indicating more severe depressive symptomatology.

## Coding

Participants' responses to the AMT were coded for the number of OGMs as well as for positive and negative child- and maternal-representations. Because prior research on OGM has relied on retrospective reporting of abuse, participants' willingness to disclose information may influence research findings. Moreover, there is evidence that maltreated children are more controlling and have less positive relationships with the examiner during similar paradigms in which children are asked to narrate responses (Toth et al., 1997). Thus, measures of child controllingness and the quality of the child-interviewer relationship were included to determine whether relationship/interaction variables might adversely affect memory findings. Coders rated the controllingness of the child, and the global warmth/friendliness of the relationship between the child and interviewer. Two research assistants who were unaware of group status or study hypotheses completed the coding. For reliability, each coded 10% of the others' work. Intraclass correlations ranged from .71 to .99 ( $M = .88$ ). Details of the coding procedures are described in the following sections and are adapted from the coding schemes of Johnson and colleagues (2005) and Williams & Broadbent (1986).

**Overgeneral and Specific Memories**—All memories were coded as either specific or overgeneral. OGMs were defined as “memories that did not contain at least one specific detail that identifies an event as a distinct episode” (Johnson et al., 2005). The total number of overgeneral and specific memories in response to positive and negative cue words was calculated.

**Child and Maternal Representations (Adapted from the MacArthur narrative coding manual-Rochester Revision, MNCM-RR; Robinson, Mantz-Simmons, Macfie, & MacArthur Narrative Working Group, 2000)**—The presence/absence of positive and negative representations of self(child) and of mother was recorded for each cue word. The total number of positive and negative representations was then summed for positive and negative cue words.

Positive self-representations include instances where the child describes the self as displaying or receiving affection, or displaying empathy/helping, compliance, or affiliation. Negative self-representations involve instances of aggression, noncompliance, and shame. Positive maternal-representations include behaviors that are protective, caretaking, affectionate, and helpful. Negative maternal-representations were coded for behaviors that are harsh, rejecting, or ineffectual.

**Child Control/Opposition and Engagement with Interviewer/Global Warmth or Friendliness of Child (Adapted from the MNCM-RR; Robinson et al., 2000)**—After listening to the AMT, coders rated participants' controlling or oppositional behaviors on a 12-point Likert-type scale. Scores of 1-3 were rated for no controlling or oppositional behavior. Scores of 10-12 were rated if the child was openly hostile, rude or provocative in behavior, or refusing to co-operate. Following the controllingness rating, the coder rated the quality of the interaction between the examiner and the child. The rating ranges from a



conflictual, uncomfortable interaction, through more neutral relating, to a feeling of warm connectedness.

## Results

Age group was evaluated as an independent variable in memory analyses. Age grouping follows Hammen & Zupan (1984), and Rudolph, Hammen & Burge (1995), such that children ages 7-9 were compared to children ages 10-14.

To evaluate the first hypothesis, the design utilized a 2(age group)  $\times$  3(maltreatment status)  $\times$  2(valence of cue) repeated measures analysis of covariance (ANCOVA) on the number of OGMs. The repeated measure was valence of cue type (positive vs. negative). Preliminary correlational analyses revealed that child cognitive performance and gender were significantly related to several of the dependent variables of interest. Therefore, PPVT-III scores and gender were entered into the analysis as covariates in order to minimize their role in subsequent analyses. No significant within-measures effects of valence were found. The between subjects analysis revealed a significant effect of subtype (Table 2). Subsequent pairwise comparisons, Bonferroni corrected, to investigate the significant subtype main effect revealed that the abused children demonstrated more OGMs than did the neglected children and the nonmaltreated children, thus partially confirming Hypothesis 1 (Table 2). Consistent with Hypothesis 2, there was a significant main effect of age group; however, the direction of effect was opposite to that which was predicted, such that younger children demonstrated more OGMs than did the older children.

A multivariate analysis of covariance (MANCOVA) was conducted on self- and maternal-representations, controllingness and relationship with the examiner with maltreatment subtype and age group as the between subjects factors. Child gender and PPVT-III scores were covariates. A significant multivariate effect of subtype emerged,  $F(12, 346) = 2.81, p < .01$ , Partial  $\eta^2 = .09$ . The main effect of age group was nonsignificant,  $F(6, 172) = .84, n.s.$ , as was the interaction of age group and subtype,  $F(12, 346) = .66, n.s.$

Univariate analyses revealed a significant main effect of subtype for negative child representations, controllingness, and warmth (Table 2). Subsequent pairwise comparisons, Bonferroni corrected, revealed that abused children's memories contained more negative self-representations than did those of the nonmaltreated children. The neglected children's memories did not significantly differ from either the abused or the nonmaltreated children's memories regarding negative self-representations. Predictions among maltreatment subtypes regarding differences in maternal positive representations and maternal negative representations were not supported (Table 2).

Regarding controllingness, the abused children were rated significantly higher than were the neglected children (Table 2). Abused children did not differ from the nonmaltreated children on controllingness. Concerning warmth, the neglected children were rated higher on warmth than both the abused children and the nonmaltreated children. Given this pattern of findings, with no differences in controllingness or warmth between the abused and nonmaltreated children, it was not necessary to control for these relational variables in subsequent analyses because they did not affect the memory findings.

Mediation analyses to address Hypotheses 3 and 4 were conducted with a subset of 93 children for whom the self-report measures necessary for this analysis were available. This sample included only children from the abused ( $N = 27$ ) and nonmaltreated ( $N = 65$ ) groups because only abuse was significantly associated with OGM.

To test whether children's self-representations could account for the effects of abuse on overgeneral memory (Hypothesis 3), we conducted a series of regression analyses to test for mediation (Baron & Kenny, 1986). As already described, children's negative self-representations were significantly related to maltreatment subtype. Specifically, a history of abuse accounted for a significant proportion of variance in the amount of negative self-representations contained within children's memory narratives,  $F(1, 86) = 7.00, p = .01$ . In addition, abuse was significantly related to overgeneral memory. To demonstrate mediation, it is necessary to additionally show that 1) negative self-representations predict overgeneral memory, and that 2) statistically controlling for negative self-representations reduces or eliminates the effect of abuse on overgeneral memory. As shown in Figure 1, there was not evidence for mediation by negative self-representations. Abuse was significantly related to negative self-representations,  $\beta = .28, p < .01$ . Negative self-representations, in turn, significantly predicted overgeneral memory  $\beta = .28, p < .01$ . As described above, abuse significantly predicted overgeneral memory  $\beta = .28, p < .01$ . However, statistically controlling for negative self-representations did not render the effect of abuse on overgeneral memory non-significant  $\beta = .21, p < .01, \Delta\beta = .07$ .

To evaluate whether children's depressive symptomatology could account for the effects of abuse on overgeneral memory (Hypothesis 4), a parallel series of regression analyses to test for mediation were conducted (Baron & Kenny, 1986). First, a history of abuse accounted for a significant proportion of variance in children's depressive symptomatology,  $\beta = .21$ . A significant effect of subtype emerged for square-root transformed depressive symptoms,  $F(1, 89) = 3.86, p < .05$  such that abused children demonstrated more depressive symptoms ( $M = 2.74, SD = 1.2$ ) than did the nonmaltreated children ( $M = 2.14, SD = 1.4$ ). As described above, abuse was significantly related to overgeneral memory. To demonstrate mediation, it is necessary to additionally show that 1) depressive symptoms predict overgeneral memory, and that 2) statistically controlling for depressive symptoms reduces or eliminates the effect of abuse on overgeneral memory. As shown in Figure 2, there was not evidence for mediation by depressive symptoms. Abuse was significantly related to depressive symptoms,  $\beta = .21, p < .05$ . Depressive symptoms significantly predicted overgeneral memory,  $\beta = .22, p < .05$ . However, statistically controlling for depressive symptoms did not significantly reduce the effect of abuse on overgeneral memory,  $\Delta\beta = .002$ .

## Discussion

### Aspects of Autobiographical Memory

This investigation addresses several significant gaps in the literature on the relation between trauma and autobiographical memory by providing a comprehensive analysis of the form and content of children's autobiographical memory recall. Additionally, the examination of children's self-system functioning through the analysis of self-representations and psychopathology informs theoretical accounts of the mechanisms which underlie the OGM effect.

**Overgeneral Memory**—A central finding of this research is that abused children demonstrated more OGM than did nonmaltreated children. Despite the plethora of studies that have linked OGMs to trauma among adults (see Williams et al., 2007 for review), this investigation provides the first evidence of OGM as a function of trauma among a sample of children with documented histories of abuse. Corroboration of maltreatment experiences independent of self-report is particularly critical for investigations of the impact of trauma on memory, given the inherent flaw in relying on participants' memories to both identify abuse and provide evidence of memory deficiency.



Consistent with this investigation, DeDecker and colleagues (2003) found that higher levels of self-reported childhood trauma were associated with reduced autobiographical memory specificity. However, the effect of participants' current psychopathology on memory retrieval could not be differentiated from the effects of self-reported abuse. Similarly, the study by Kuyken and colleagues (2006) was conducted among depressed adolescents with and without self-reported abuse histories. In contrast to the findings of the current investigation, Kuyken found that depressed adolescents who reported a history of trauma recalled fewer OGMs than depressed adolescents without a trauma history. Yet, the lack of a nondepressed trauma-exposed sample obscures an understanding of the role of trauma in OGM. The study conducted by Johnson and colleagues (2005) found no association between children's self-reported abuse histories and OGM. Rather, recent family violence was associated with OGMs. However, the operationalization of family violence prevented the authors from differentiating the effects of domestic violence from that of child physical abuse on children's memories.

The finding that children who have been abused demonstrate overgenerality in their autobiographical memory recall is important for informing theoretical perspectives on the development of OGM. One significant gap in the literature supporting Williams' theory has been the lack of evidence of overgenerality among abused children, despite the centrality of early trauma to his model. Therefore, evidence that children who have been abused demonstrate more OGM than do nonmaltreated children provides much needed evidence that such a pattern of memory retrieval also is associated with memory overgenerality in childhood. The finding that neglected children did not demonstrate increased OGM as compared to the nonmaltreated children further supports William's notion of functional avoidance as a central mechanism in OGM development. Children who have been abused have experienced the commission of trauma(s) and, therefore, may be likely to develop OGM to avoid accessing specific painful memories. In contrast, neglect tends to be chronic omission of basic caregiving, and is not incident-specific. Thus, in the absence of abuse experiences, neglected children may not demonstrate OGM because they do not have specific painful memories to avoid in their autobiographical memory search.

**Age effects**—Age also was related to autobiographical memory performance; however, the direction of this effect was opposite than that which was predicted such that younger children produced more OGMs than did older children. Older children were predicted to demonstrate more OGM based on the findings of the only prior investigation of OGM among maltreated children (Johnson et al., 2005). Nonetheless, developmental differences in executive control may account for differences between the younger and older children. For example, Conway & Pleydell-Pearce (2000) emphasize the importance of executive control to direct the autobiographical memory search and to inhibit irrelevant information during retrieval. Considering that inhibitory control is a skill that is developed throughout childhood, increased overgenerality in autobiographical memory among younger children might be related to difficulty in inhibiting information that is activated at the intermediate description level of memory search.

### **Mediation of Overgeneral Memory**

**Affective Representations**—The finding that negative self-representations are related to OGM has important implications for theories of autobiographical memory and OGM development. In particular, our findings corroborate the notion that conceptual self-representations play a significant role in autobiographical memory (e.g., Conway & Pleydell-Pearce; 2000). Moreover, these findings support Williams and colleagues' (2007) model of OGM which hypothesizes that individuals with activated negative self-representations may become captured in their memory search at the level of conceptual self-

representations, resulting in OGM. The current investigation adds to the literature by providing empirical support for the association of negative self-representations to OGM. Nonetheless, the finding that negative self-representations do not mediate the relationship between abuse and OGM emphasizes the centrality of early trauma to the development of OGM, and highlights the notion of functional avoidance of painful memories as a key mechanism in the development of OGM.

**Depression**—In partial support of our hypotheses, depression was significantly related to OGM, thus confirming a well-established pattern in the literature (see Williams et al., 2007 for review). Hierarchical regression did not support a significant indirect pathway between abuse and OGM via depressive symptoms. Therefore this investigation adds clarity to our understanding of the mechanisms that underlie OGM by demonstrating that trauma is associated with OGM, independent of depression. This finding corroborates several other investigations that have linked childhood trauma to OGM, even after controlling for levels of depression (DeDecker et al., 2003; Henderson et al., 2002; Kuyken & Brewin, 1995). Hence, the current research validates the association between abuse in childhood and OGM, which cannot be accounted for by depression, with a sample of children for whom maltreatment experiences were determined independently of children's memory and willingness to disclose abuse.

### Limitations

There are limitations to this investigation that should be addressed. For example, although a general measure of language abilities that is highly correlated with IQ was included and controlled for throughout our analyses, the lack of an additional measure of memory performance or executive control precludes our ability to differentiate OGM processes from broader deficits in general memory performance. However, several studies have illustrated that autobiographical memory deficits linked to trauma and depression are not accounted for by measures of working memory, general episodic memory, or semantic memory (DeDecker et al., 2003; Raes, Hermans, Williams, & Eelen, 2006). In tandem with research that supports a lack of alterations in basic memory functioning among maltreated children (e.g., Howe, Cicchetti, Toth, & Cerrito, 2004; Valentino, et al., 2008), it seems unlikely that differences in generalized memory ability have confounded the overgeneral memory findings of the current investigation. In addition, it should be noted that the AMT paradigm has not been validated for use with children. However, the AMT has been successfully used in two prior investigations (Drummond, et al., 2006; Johnson et al., 2005), and by age 7 the quality of children's autobiographical memory recall is considered comparable with adult functioning (Gathercole, 1998). Finally, it is important to recognize that the reduction in sample size for the mediation analyses reduced our overall power and contributed to null findings.

In addition, it should be highlighted that the data presented in this investigation are not longitudinal in nature, thus preventing the establishment of temporal precedence that is ideal for mediational analyses. Longitudinal research will be necessary to determine whether negative self-representations and depression may be mediators or moderators in the relationship between child abuse and OGM recall. It is important to note that most of the depressive symptomatology demonstrated by the children in this sample was in the subclinical range. Therefore, it remains unclear how clinical depression might play a role in OGM. Prospective longitudinal research would inform our understanding of the role of depression in OGM, and of overgenerality as a potential marker of vulnerability to the development of depression.

## Clinical Implications and Future Directions

The finding that child abuse is associated with OGM is particularly significant, considering evidence that OGM is itself associated with several important aspects of psychological functioning. For example, OGM in nondepressed adults with a history of depression predicts later depressive symptomatology (e.g., Gibbs & Rude, 2004; Mackinger et al., 2000), and overgenerality is associated with delayed recovery from episodes of affective disorders (e.g., Brittlebank et al., 1996; Dalgliesh et al., 2001). Therefore, OGM might serve as a marker for future vulnerability for depression. However, no investigations to date have prospectively examined overgenerality in childhood in relation to later emotional disturbance. A longitudinal follow-up of the current sample could address whether overgenerality is a risk factor associated with the development of depression.

Additionally, OGM is related to deficits in interpersonal problem solving and poorer outcomes for individuals in therapy (Brittlebank et al., 1996; Evans, Williams, O'Loughlin, & Howells, 1992; Sidley, Whitaker, Calam, & Wells, 1997; Williams & Dritschel, 1988). As such, interventions that target memory specificity for day-to-day experiences may improve outcomes. For example Serrano, Latorre, Gatz, and Rodriguez (2004) examined the impact of a 4-week intervention designed to increase specificity of positive memories in depressed elderly patients. Results revealed that overgenerality was reduced following intervention, as were symptoms of hopelessness and depression. Thus, it seems that overgeneral memory is an important factor in maintaining depression and its modification can positively impact its course. Future research should consider targeting increased memory specificity in interventions for depression. Furthermore, interventions that focus on reducing negative self-representations might facilitate specificity of autobiographical memory recall and could reduce vulnerability to later affective disturbance

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## Abbreviations

OGM      overgeneral memory

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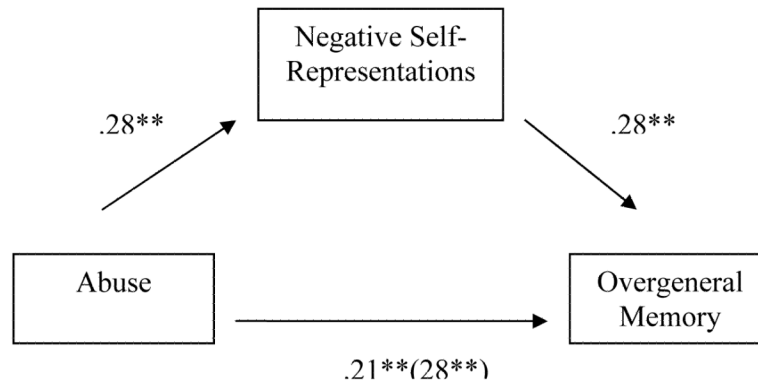
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### Key Points

- Research among adults supports associations between early trauma and overgeneral memory (OGM), and between depression and OGM; however, few studies have examined OGM processes among children
- In the current study overgeneral autobiographical memory recall was examined among abused, neglected, and nonmaltreated children
- Findings revealed abused children demonstrated more OGM than nonmaltreated children
- Although significantly related to OGM, neither negative self-representations nor depression mediated the relation between abuse and OGM
- Implications for clinical intervention are discussed

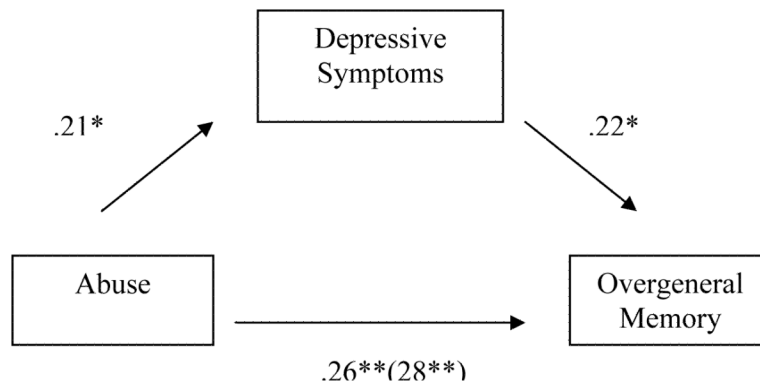




**Figure 1.**

Mediation of relationship between abuse and overgeneral memory: negative self-representations.

Values represent standardized coefficients. Value in parentheses represents standardized coefficient of the direct effect, before adding negative self-representations to the model ; \*  $p < .05$ , \*\*  $p < .01$



**Figure 2.**

Mediation of relationship between abuse and overgeneral memory: depressive symptomatology

Values represent standardized coefficients. Value in parentheses represents standardized coefficient of the direct effect, before adding depressive symptoms to the model; \*  $p < .05$ , \*\*  $p < .01$

**Table 1**

## Demographic Characteristic Means and Standard Deviations

|                                | <b>Abused<br/>(N= 36)</b> | <b>Neglected<br/>(N= 34)</b> | <b>Non-Maltreated<br/>(N = 115)</b> |
|--------------------------------|---------------------------|------------------------------|-------------------------------------|
| <b>Mean Child Age</b>          |                           |                              |                                     |
| Years                          | 10.69(1.6)                | 10.78(1.7)                   | 10.51(1.5)                          |
| <b>Child Gender</b>            |                           |                              |                                     |
| Male                           | 66.7%                     | 55.9%                        | 47.0%                               |
| <b>Family Marital Status</b>   |                           |                              |                                     |
| Single                         | 61.1%                     | 78.1%                        | 67.3%                               |
| <b>Ethnicity</b>               |                           |                              |                                     |
| Minority                       | 69.4%                     | 79.4%                        | 85.2%                               |
| <b>SES(Hollingshead, 1975)</b> |                           |                              |                                     |
| Lowest two social strata       | 86.1%                     | 68.8%                        | 73.5%                               |
| <b>Cognitive Performance**</b> |                           |                              |                                     |
| PPVT-III(standard score)       | 86.78(10.2) <sup>a</sup>  | 93.84(10.6) <sup>b</sup>     | 96.52(12.9) <sup>b</sup>            |

<sup>a</sup>Indicates significant group differences, see text for explanation

<sup>b</sup>Indicates significant group differences, see text for explanation

\*  
 $p < .05^*$  (2-tailed)

\*\*  
 $p < .01$

**Table 2**  
Means and Standard Deviations by Maltreatment Subtype Group, Controlling for Gender and PPVT-III standard score

| Dependent Variable                           | Abused                 | Neglected              | Nonmaltreated          | F    | p    | Partial Eta <sup>2</sup> |
|----------------------------------------------|------------------------|------------------------|------------------------|------|------|--------------------------|
| Overgeneral Memory <sup>**</sup>             | 3.00(1.2) <sup>a</sup> | 2.26(1.1) <sup>b</sup> | 2.39(1.2) <sup>b</sup> | 4.62 | .011 | .051                     |
| Positive Self- Representations               | 1.17(1.1)              | 1.40(1.1)              | 1.04(1.1)              | 0.86 | .47  | .010                     |
| Negative Self- Representations <sup>**</sup> | 1.75(1.1) <sup>a</sup> | 1.41(1.1)              | .097(1.1) <sup>b</sup> | 7.10 | .001 | .074                     |
| Positive Maternal-Representations            | 0.73(.79)              | 0.58(.79)              | 0.65(.93)              | 0.23 | .79  | .003                     |
| Negative Maternal- Representations           | 0.29(.76)              | 0.62(1.0)              | 0.42(.78)              | 1.27 | .29  | .014                     |
| Controllingness <sup>*</sup>                 | 3.28(2.0) <sup>a</sup> | 2.39(1.9) <sup>b</sup> | 3.1(2.0)               | 3.15 | .046 | .034                     |
| Warmth <sup>**</sup>                         | 7.20(2.5) <sup>b</sup> | 9.17(2.4) <sup>a</sup> | 7.67(2.5) <sup>b</sup> | 5.47 | .005 | .058                     |

<sup>a</sup>Indicates significant group differences, see text for explanation

<sup>b</sup>Indicates significant group differences, see text for explanation

\*  $p < .05$  (2-tailed)

\*\*  $p < .01$