

Preschoolers' Memory for Threatening Information Depends on Trauma History and Attentional Context: Implications for the Development of Dissociation

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ABSTRACT. Although the roots of dissociative ability are thought to lie in early childhood, little is understood about how or why children dis-

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sociate or how dissociative abilities develop over time. Previous cognitive studies of adults suggest that some dissociative adults use divided attention to keep threatening information out of awareness (DePrince & Freyd, 1999, 2001). This study utilized a divided attention memory task similar to those used by DePrince and Freyd (DePrince & Freyd, 1999), but modified for four- and five-year-olds. Contrary to prediction, children with relatively high dissociation scores did not differ in their memory for charged and neutral pictures under divided attention when compared to children with low dissociation scores. Consistent with predictions, under divided attention, abused children remembered fewer charged pictures relative to non-abused children. The same pattern was found when comparing abused children with high dissociation scores to non-abused children with low dissociation scores. These results are consistent with the idea that some traumatized people use divided attention to keep threatening information out of awareness. Results are discussed in terms of a developmental theory of dissociation. *[Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <http://www.HaworthPress.com> © 2004 by The Haworth Press, Inc. All rights reserved.]*

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INTRODUCTION

Traumatized people frequently have difficulty with attention and memory (Cuffe, McCullough, & Pumarlega, 1994; DePrince & Freyd, 1999; Freyd, 1996; Hunter, 2001). Difficulty with attention is a key feature of both post-traumatic stress disorder (PTSD) and dissociative disorders. Caregivers often describe dissociative children as “spacey,” “in a trance,” “in their own world” and as frequent daydreamers (Putnam, 1997). Children with PTSD also have difficulty with attention, and DSM-IV criteria for PTSD includes the symptom “difficulty concentrating” as well as several symptoms, including hypervigilance and experiencing intrusive thoughts, that seem likely to interfere with focused attention (American Psychiatric Association, 1994; Weinstein, Staffelbach, & Biaggio, 2000).

Perhaps because attention symptoms are often associated with trauma, a high percentage of abused children are diagnosed with attention deficit hyperactivity disorder (ADHD, Famarularo, Kinscherff, & Fenton,

1992; McLeer, Callaghan, Henry, & Wallen, 1994; McLeer, Deblinger, Henry, & Orvaschel, 1992; Merry & Andrews, 1994). This raises the concern that clinicians and pediatricians may be diagnosing ADHD without treating trauma symptoms that in fact may be the root of the problem.

Memory problems also figure prominently in dissociation and PTSD. In the DSM-IV, dissociative identity disorder requires “the inability to recall important personal information that is too extensive to be explained by ordinary forgetfulness” (American Psychiatric Association, 1994, p. 487). PTSD includes several symptoms related to both the inability to remember and intrusive memories for traumatic events, including “inability to recall an important aspect of the trauma” and “recurrent and intrusive distressing recollections of the event” (American Psychiatric Association, 1994, p. 428). This study draws on a literature pointing to similarities between symptoms of ADHD and trauma-related symptoms in children, as well as previous laboratory studies with adults, to investigate the role trauma and dissociation play in preschoolers’ memory for threatening information.

FAILURE TO REMEMBER ABUSE: WHY AND HOW?

People who have experienced abuse perpetrated by caregivers are especially likely to have difficulty recalling information about the abuse (DePrince & Freyd, 1999; Freyd, 1994). Children in this situation depend on their abusers for the emotional and physical support they need to survive. Davies and Frawley (1994) described the situation as follows:

The continued survival of the child is felt to be at risk, because the actuality of the abuse jeopardizes [the] primary object bond and challenges the child’s capacity to trust and, therefore, to securely depend. (p. 62)

Freyd (1994, 1996) developed betrayal trauma theory, positing that children remain unaware of caregiver-perpetrated abuse, not because remembering the abuse is too painful, but because it allows them to maintain the vital attachment to their caregivers. Analyses of several studies support the hypothesis, derived from betrayal trauma theory, that people who experience caregiver abuse are more likely to not re-

member their abuse experiences than are people who experienced other kinds of traumas (Freyd, 1996; Freyd, DePrince, & Zurbriggen, 2001).

Dissociation is one mechanism that may allow people to remain unaware of abuse because it allows for “knowledge isolation” (Freyd, 1994, 1996). Knowledge isolation refers to the separation of some or all aspects of experience from those experiences that are continually available. Dissociation need not be extreme (e.g., Type D attachment or dissociative identity disorder) to facilitate the knowledge isolation that affects people’s ability to remember aspects of their experience. In a community sample of 800 adults, betrayal trauma (including sexual abuse, physical abuse and domestic violence perpetrated by caregivers) was more strongly associated with high Dissociative Experiences Scale (DES) scores than were non-betrayal traumas (Goldberg & Freyd, under review). In this paper, we use the term “dissociation” to refer to the cognitive process by which people experience information that would otherwise be integrated and continuously available as disintegrated and/or unavailable to recall.

To test the hypothesis that dissociation allows people to remain unaware of abuse perpetrated by caregivers, Freyd and colleagues (DePrince & Freyd, 1999, 2001; Freyd et al., 2001) have conducted a series of cognitive laboratory studies. DePrince and Freyd (1999) asked high and low dissociators to complete a modified Stroop task under selective and divided conditions. Participants were shown words that would be particularly charged for sex abuse survivors (e.g., rape) and neutral words (e.g., star). Under selective attention, participants were given standard Stroop instructions: to ignore the word and name the ink color. Under divided attention, participants were asked to both name the ink color and remember the words. Free recall tests followed each attention condition.

DePrince and Freyd (1999) reported two major findings. First, there were differences related to the attention conditions. Low dissociators showed less interference (that is, had better performance) under selective attention as compared to high dissociators. However, under divided attention, high dissociators had less interference (better performance) as compared to the low dissociators. The second major finding concerned high and low dissociators’ memory of neutral and charged words. High dissociators recalled more neutral words and fewer charged words compared to low dissociators, who recalled more charged words and fewer neutral words. These findings support the hypothesis that high dissociators have developed divided attention skills in order to keep threatening information out of awareness.

In a second study, DePrince and Freyd (2001) asked high and low dissociators to complete a directed forgetting task under divided attention conditions that included neutral and charged stimuli. In this task, participants viewed a list of words one at a time on a computer screen with an instruction either to remember or to forget the word. The traditional effect for directed forgetting tasks is that participants remember more words that they were told to remember than words they were told to forget. In a significant interaction, high dissociators recalled fewer trauma words that they had been instructed to remember and more neutral words as compared to low dissociators, who recalled more trauma and fewer neutral words. These results are also consistent with the hypothesis that high dissociators are able to use divided attention to keep threatening information out of awareness.

The methodology of these studies is similar, in some ways, to cognitive studies that suggest the opposite effect. In these studies, anxiety or post-traumatic stress symptomology is related to an attentional bias *toward* threatening information. These studies have grown out of findings that, in general, people tend to selectively focus on threatening information (Beck, Emery, & Greenberg, 1985; Pratto & John, 1991). Under many circumstances, early processing of threat-related information is adaptive because it facilitates a quick response to threat (Derryberry & Reed, 2002). Researchers have found support for the hypothesis that anxious people show an exaggerated attention bias toward attending to threatening information (Keogh, Dillon, Georgiou, & Hunt, 2001; Williams, Mathews, & MacLeod, 1996).

Recently, researchers have found that adults diagnosed with PTSD spend more attentional resources attending to threatening information than do those without a PTSD diagnosis (Amir, McNally, & Wiegartz, 1996; Cassiday, McNally, & Zeitlin, 1992; Foa, Feske, Murdock, Kozak, & McCarthy, 1991; Kaspi, McNally, & Amir, 1995; Thrasher & Dalgleish, 1999). Studies of children have demonstrated the same effect (Dalgleish, Moradi, Taghavi, Neshat-Doost, & Yule, 2001; Moradi, Taghavi, Heshat Doost, Yule, & Dalgleish, 1999). Results of these studies are not always consistent, however, suggesting there may be a more complex relation between anxiety and attention than is captured by the studies (Dalgleish et al., 2003).

The studies conducted by Freyd and colleagues differ from the anxiety/PTSD studies in two important ways. First, participants in the DePrince and Freyd (1999, 2001) studies differ on dissociative experiences, not anxiety or PTSD symptoms. Second, DePrince and Freyd's (1999, 2001) studies show that dissociative people perform better only

under divided attention, a condition usually not included in the anxiety/PTSD studies. The DePrince and Freyd (1999, 2001) studies utilize from the theory that people who experience trauma at the hands of caregivers are more likely to develop divided attention skills to avoid traumatic reminders, a separate process from that proposed by those who have studied attentional biases toward threat cues. To our knowledge, no studies to date have addressed dissociative or divided attention processes in children that would account for a tendency to remain unaware of betrayal or abuse.

CHILD DEVELOPMENT AND COGNITIVE ENVIRONMENTS

Dissociation in both adults and children has been associated with a history of trauma, particularly child abuse (Bernstein & Putnam, 1986). Although all young children appear to show some degree of dissociation as measured by the Child Dissociative Checklist (CDC; Putnam, 1997), research indicates that scores on the CDC for non-dissociative (abused and non-abused) children generally decrease from age 5 to age 16. In contrast, these scores remain elevated for children diagnosed with dissociative disorders (Putnam, 1997). These data are consistent with the view that some traumatized children utilize dissociative skills to cope, and retain their developed dissociative skills into adulthood. This may help to account for the finding that adults with high dissociation scores are more likely to have experienced trauma than are young children with high dissociation scores.

In reviewing the literature on biases either toward or away from threat-related information, Newman and McKinney (2002) write, "It is hard to imagine how a tendency to ignore charging pit bulls, out-of-control automobiles, armed assailants, or falling safes and flower pots could or would be maintained in the long run" (p. 411). This observation highlights a fundamental difference between anxiety/PTSD and dissociation/avoidance. For people who have experienced fear-based traumatic events such as war combat, post-traumatic anxiety may indeed lead to a hypervigilance for signs of threat. This makes sense because people in these situations could perhaps do something to avoid future threats.

In contrast to trauma victims with PTSD, we suspect that many abused children live in situations in which it makes sense to *ignore* threats. A child who can ignore the reality that her father sexually abuses her is able to maintain attachment to her source of emotional and

physical resources. A young child who witnesses domestic violence is likely better off to ignore his parent's increasing anger. If he were to react, either by becoming upset and crying or by trying to intervene in a fight, he is likely putting himself in even greater danger. In addition, non-offending parents are unlikely to have direct conversations with their children about abusive events, even if they suspect or know they are occurring, either out of concern for bringing up what may be perceived as an upsetting topic for a child or simply not wanting confront the problem. This lack of communication about events makes it even less likely that children will pay attention to, remember and respond to these kinds of threats (Freyd, 1994, 1996).

HYPOTHESES

The presence of some degree of dissociation in many young children complicates the study of dissociation in children. For example, many young children have imaginary friends that are often quite vivid. While some characteristics of such companions, such as a child's inability to recognize an imaginary friend as imaginary, may be more likely to be associated with trauma rather than normative pretend play (Putnam, 1997), it is often difficult to distinguish between normative and trauma-induced dissociation.

Another complicating factor concerning the assessment of dissociation in children is the internal nature of many dissociative symptoms. For example, the Dissociative Experiences Scale, (DES, (Bernstein & Putnam, 1986)) a widely used measure for adults, asks about experiences that are difficult for outside observers to recognize. For example, the DES includes the following derealization item: "Some people have the experience of feeling that other people, objects, and the world around them are not real." It is difficult at best to ask young children about these same experiences. Observer-report measures for children, including the Trauma Symptom Checklist for Young Children (TSCYC; Briere et al., 2001), do not assess children's feelings of derealization or other internal processes related to dissociation in the same way. Instead, the TSCYC includes more items such as "Living in a fantasy world" that are difficult for observers to identify as a dissociative process that differs from children's everyday, non-dissociative behavior.

In addition, developmental factors may lead many non-traumatized preschoolers to be classified as highly dissociative while this is generally not true for adults. Preschoolers' normal fantasy play and differ-

ences in their abilities to pay attention may elevate their dissociation scores (Becker, 2002; Rhue, Lynn, & Sandberg, 1995). In assessing the relationship between dissociation and trauma, it is also possible that some parents may not report abuse for children who had in fact experienced abuse.

With these developmental differences between child and adult dissociation in mind, we developed a task and hypotheses that matched as closely as possible the previous adult studies, and in particular DePrince and Freyd (1999). Specifically, we hypothesized that children with high dissociation scores (high dissociators) would remember more neutral stimuli, and fewer charged stimuli, under divided attention, as compared to low dissociators. We did not expect to see this pattern in a focused attention condition.

METHOD

Participants

The sample consisted of eighty parents and preschool children (M age = 4.4 years, $SD = 0.33$) who responded to fliers posted in preschools, community centers, social services offices, and similar public locations. The fliers invited parents to participate in a study of pretend play and life stress with their 4-5-year-old children. The fliers indicated that “children who have and have not experienced stressful life events” were needed, and did not define “stressful life events.” All of the parents and children who initially responded to the flier were recruited into the study. Additionally, in order to ensure adequate numbers of high dissociators, at the end of data collection, approximately 10 more children were recruited by first asking any parent who responded to the flier to complete the dissociation scale of the TSCYC over the phone. Children who had moderately high (12 or higher) scores were then asked to participate in the study.

None of the participating children had begun kindergarten. Participating families were predominately Caucasian ($N = 67$) and were of lower to middle socioeconomic status. Most lived in a medium-sized city in Oregon; some lived in nearby rural areas. Forty-six (58%) of the participating children were girls. Fifty-four (68%) of participating parents were married or living with another parent. Two grandmothers, three aunts, and five fathers participated (and are referred to as “parents” throughout this paper). The remaining parents were biological or

step-mothers. All participating parents were primary caregivers and had physical custody of the participating child. Four pairs of children were related to one another. Two were cousins, two were twins, two were non-twin siblings and two were half-siblings. When analyses were conducted without the data for the biologically related children, the results did not differ from those presented.

Procedure

An Institutional Review Board approved the experimental procedure. Families participated in one lab session that lasted between one and two hours. Two families who were unable to complete the session in two hours returned for a second session. Parents were compensated with \$40, and children received a small toy. When necessary, participants were provided with taxi transportation to the laboratory.

Parents signed informed consent forms, and experimenters explained the procedures to children at the beginning of lab sessions. Children then completed a variety of tasks with an experimenter. Parents watched children on a video screen while completing questionnaires on the child's trauma history, trauma symptoms, and behavior as well as additional questionnaires not reported here.

At the end of the session, researchers provided parents with information on community resources. In accordance with the human subjects protocol, researchers were prepared to report abuse if participants directly told the researchers about it. However, no participants gave the researchers information that required a report. Researchers assisted some parents in locating community resources (e.g., domestic violence services, counseling or food banks).

Measures

Parents completed the Brief Traumatic Experiences Survey-Parent Version (BBTS-P, appended to Becker, 2002). The BBTS-P is a modified version of the adult self-report Brief Betrayal Trauma Survey (BBTS; Freyd & Goldberg, under review) that asks parents to report on a range of experiences that their children might have experienced, including being in a natural disaster, witnessing violence, and being physically, sexually or emotionally abused. The measure also asks about death of immediate family members. The BBTS-P was presented on a computer, and parents completed it outside of the presence of the researcher. For each item that the parent endorsed, follow-up questions

asked for the number of times each event occurred, and the dates of the first and last incident. In this way, parents were able to anonymously report on abuse that their children had experienced.

Parents completed the TSCYC on their child's trauma symptoms. The TSCYC yields several trauma symptom scales. Briere and colleagues (2001) report scale alphas ranging from 0.81 to 0.93, with an average scale alpha of 0.87 in samples of abused children. In this sample, scale alphas ranged from 0.55 to 0.92. The dissociation scale consists of nine items related to what has been termed "absorption" (e.g., "acting like he or she was in a trance"). The dissociation scale has theoretical range of 9 to 36. In this sample, the mean dissociation scale score was 11.1, $SD = 3.0$, range = 9-25.

Memory Task

During the lab visit, children completed a memory task and three other tasks measuring pretend play, verbal ability and theory of mind ability not presented here. The memory task was designed to test memory under focused and divided conditions for both neutral and threat-related stimuli. It was designed to be similar to previously published adult tasks (e.g., DePrince & Freyd, 1999). The task had both focused and divided attention phases.

During both the focused and divided attention phases, children were presented with eight pictures. Four of the pictures in each phase were chosen to be threat-related or charged and four were neutral. The pictures, taken from Berenstain Bear children's books, were all the same size. An example of a neutral picture is a scene in which Mama Bear is pushing a wheelbarrow and Sister Bear is looking at wheelbarrow wheel. An example of a charged picture is a scene in which Papa Bear is slamming his fist on the dinner table while Sister and Brother Bear watch with scared faces. Thus, the charged pictures did not directly portray abuse, but may have reminded children of stressful or abusive events that they may have experienced.

During the focused attention phase, experimenters asked the children to sit in a child-sized chair and to look at pictures in a book that was placed in front of them on a child-sized table. The experimenter sat next to them and turned the pages every 10 seconds, and did not talk to the children while presenting the stimuli to the children, except to redirect children to the task as necessary.

During the divided attention phase, in addition to looking at the pictures in the book, children were asked to listen to a tape of an experi-

menter reading a list of animal names (e.g., “horse,” “cow,” “sheep”). Children held a toy sheep that squeaked when squeezed. Children were instructed to squeak the sheep when and only when they heard the word “sheep.” An animal name was presented every two seconds and the word “sheep” was presented once in every 10 second interval. Children were told that this was called “the sheep game.” Prior to beginning the divided attention phase, experimenters taught the children to play the sheep game using a tape of an experimenter giving instructions and reading a practice list of animals.

Following the focused attention task, participants were shown each test picture in a second book and asked, “Is this a picture you saw while we were looking at the first book or is this the first time you’ve seen it?” For every other question, the order was reversed and participants were asked, “Is this the first time you’ve seen the picture, or did you see it while we were looking at the first book?” Following the divided attention task, the phrase “while we were looking at the first book” was replaced with “while we were playing the sheep game.”

The order of the attention conditions and stimuli presented was counterbalanced. Some children received the focused attention condition first and then played the sheep game (divided attention condition). Other children completed the divided attention condition first and then completed the focused attention condition. Independent of the attention condition order, some children viewed one set of stimuli first (i.e., the pictures in a red binder) and then viewed a second set of stimuli (i.e., pictures in a blue binder). Other children viewed the blue binder first and then the red binder.

RESULTS

Computer failure and experimenter error led to missing data for four children. Fifty-three (53) children were classified as not known to have been abused and 23 children were classified as known to have been abused based on parents’ reports of their children’s experiences. Children included in the abused category were those whose parents reported that they had experienced emotional, physical or sexual abuse, or witnessed domestic violence. Despite the confidential parent reports, these numbers may underestimate the true amount of the children’s trauma.

On the memory task, there were no main effects or interaction effects involving either attention condition or stimuli order. Nine children appeared to not understand the instructions for the recognition memory

task. The questions used to elicit responses about memory for the items were lengthy and may have been too difficult for some children. The nine excluded children gave the same response to every question. There were no differences in age or likelihood of having experienced abuse between the excluded children and the rest of the sample.

Memory Performance by Dissociation Group

Separate two (dissociation group: low vs. high) by two (picture type: neutral vs. charged) ANOVAs were conducted for focused and divided attention memory tests to test the hypothesis that high dissociators would remember fewer charged pictures compared to low dissociators under divided attention. High and low dissociation groups were based on a median split of TSCYC dissociations scores ($M = 11.1$, $Mdn = 10.0$, $SD = 2.24$; low dissociation $M = 9.42$, $SD = 0.50$; high dissociation $M = 13.78$, $SD = 3.49$). There were no significant age differences between the high and low dissociation groups. Four children (two classified as low and two classified as high dissociators) did not have complete memory task data. The cell sizes by abuse history and dissociation group are presented in Table 1.

Under focused attention, there was a trend for participants to recall more charged ($M = 6.80$ out of a possible score of 8) than neutral pictures ($M = 6.46$), $F(1,68) = 3.13$, $p = 0.08$; see Table 2. There was no difference in high and low dissociators' scores overall ($F(1, 68) = 0.00$, $p = 0.99$). The picture type by dissociation group interaction was also non-significant ($F(1,68) = 0.02$, $p = 0.90$).

Under divided attention, participants recalled more charged ($M = 6.18$) and fewer neutral ($M = 5.74$) pictures ($F(1, 66) = 4.74$, $p = 0.03$). High and low dissociators did not differ on mean number of pictures remembered ($F(1,66) = 1.20$, $p = 0.28$). Contrary to prediction, the pic-

TABLE 1. Cell Sizes by Abuse and Dissociation Group

	Dissociation Group		Total
	Low	High	
No Reported Abuse	30	18	48
Reported Abuse	12	8	20
Total	42	26	68

Note: Nine children who did not understand the task were omitted.

TABLE 2. Memory Test Descriptive Statistics

	Attention Condition					
	Focused <i>M</i> (<i>SD</i>)		Divided <i>M</i> (<i>SD</i>)		Focused-Divided <i>M</i> (<i>SD</i>)	
	Picture Type					
	Neutral	Charged	Neutral	Charged	Neutral	Charged
Dissociation Group						
Low	6.47 (1.39)	6.78 (1.40)	5.58 (1.35)	6.09 (1.39)	0.86 (1.74)	0.70 (1.54)
High	6.44 (1.58)	6.80 (1.19)	6.00 (1.47)	6.32 (1.41)	0.44 (1.94)	0.48 (1.23)
Abuse Group						
Non-abused	6.40 (1.54)	6.70 (1.36)	5.48 (1.43)	6.30 (1.19)	0.89 (1.90)	0.39 (1.22)
Abused	6.56 (1.38)	6.83 (1.29)	6.17 (1.20)	5.72 (1.84)	0.39 (1.65)	1.11 (1.88)
Dissociation/Abuse Group						
Low/No abuse	6.47 (1.48)	6.67 (1.45)	5.39 (1.40)	6.32 (1.09)	1.04 (1.73)	0.36 (1.34)
High/Abuse	6.83 (1.48)	7.00 (1.26)	7.00 (0.89)	6.50 (1.76)	-0.17 (1.17)	0.50 (1.87)

ture type by dissociation group interaction was not significant ($F(1,66) = 0.25, p = 0.62$).

Memory Performance by Abuse History

As described in the introduction, developmental and measurement differences may lead to differences between samples of adult high dissociators and preschool high dissociators. Specifically, preschool high dissociators may be less likely than adult high dissociators to have experienced trauma. In this sample, high dissociators were not more likely than low dissociators to have experienced abuse [as reported by a parent; $X^2(1, N = 68) = 0.04, p = 0.99$]; see Table 1].

For these reasons, the same analyses were performed to test for differences in memory between abused and non-abused children, regardless of dissociation score. Of the participants that were not excluded, 18 children were classified as having experienced abuse on the basis of a parent report of emotional, physical or sexual abuse or witnessing domestic violence. Forty-eight (48) children were classified as not known to have been abused (non-abused group). The groups did not significantly differ in age.

Under focused attention, the main effects of picture type and abuse group were not significant ($F(1,64) = 1.77, p = 0.19$ and $F(1,64) = 0.22, p = 0.65$, respectively; see Table 2). The interaction of picture type with abuse group was also non-significant ($F(1,64) = 0.001, p = 0.98$).

Under divided attention, neither the main effect of picture type nor the main effect of abuse group was significant ($F(1,62) = 0.93, p = 0.34$ and $F(1,62) = 0.03, p = 0.87$, respectively). Consistent with predictions, the picture type by abuse group interaction was significant ($F(1,62) = 10.35, p = 0.002$).

Memory Performance by Dissociation Group and Abuse History

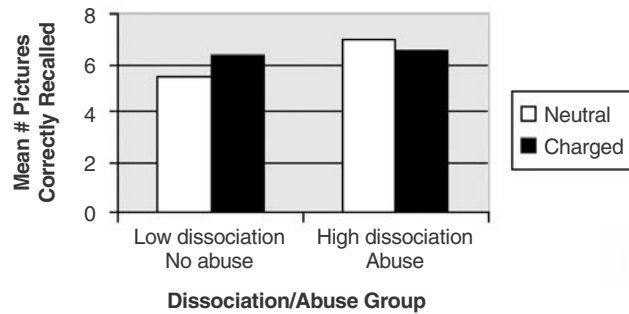
Finally, we compared memory performance of abused children with high dissociation scores and non-abused children with low dissociation scores using the same analyses. High dissociators in adult samples are likely to have trauma histories. As noted in the introduction, due to developmental differences and measurement issues, young children may have elevated scores on measures of dissociation regardless of their abuse histories. Thus, all children with high dissociation scores may not be comparable to highly dissociative adults. It is likely that those children who have *both* abuse history *and* high dissociation scores are most similar to the high dissociators in adult samples. We created a high dissociation/abuse group to better match the adult high dissociators who participated in the adult studies. Thirty (30) children were classified as non-abused/low dissociation (M dissociation score = 9.43, $SD = 0.50$) and eight children were classified as abused/high dissociation (M dissociation score = 14.00, $SD = 3.70$). The two high dissociators without complete memory data were classified as abused/high dissociation.

Results were generally the same as those for memory performance by abuse history. Under focused attention, main effects of picture type and abuse/dissociation group were not significant [$F(1,34) = 0.29, p = 0.60$ and $F(1,34) = 0.40, p = 0.53$, respectively, see Table 2]. The picture type by abuse/dissociation group interaction was also non-significant [$F(1,34) = 0.002, p = 0.96$].

Under divided attention, the main effect of picture type was non-significant [$F(1,32) = 0.44, p = 0.51$]. There was a non-significant trend for participants in the abused/high dissociation group to recall more pictures than those in the non-abused/low dissociation group [$M = 5.86$ vs. $6.75, F(1,32) = 3.52, p = 0.07$]. Finally, consistent with predictions and shown in Figure 1, the picture type by abuse/dissociation group interaction was significant [$F(1, 32) = 4.94, p = 0.03$].

This interaction is the same as the effect found for adults who were tested for memory of words during a divided attention Stroop task (DePrince & Freyd, 1999) except that, for preschoolers, combined abuse/dissociation status rather than dissociation status alone predicted

FIGURE 1. Picture type by dissociation/abuse group interaction under divided attention.



children's performance. These results are consistent with the view that children exposed to abuse develop an attention style that helps keep threatening information out of awareness.

DISCUSSION

The results indicate that the memory task designed for this study was effective in a number of ways. Most children were able to complete the focused and divided attention tasks and to make an old versus new distinction during the recognition memory task, though future research may make the procedure even easier for children to complete. The task yielded an acceptable range of memory scores allowing for comparisons between groups without problems of skewness, outliers, or ceiling or floor effects. Similarly, no effects of stimuli order were detected.

The results of the current study with abused children, along with previous studies of attention and memory with dissociative adults, provide support for the hypothesis that people who grow up in abusive homes develop divided attention skills that help them keep threatening information out of awareness.

Whereas dissociation score alone predicted memory in adults, abuse history contributed to memory ability in preschoolers. By focusing only on the abused/high dissociation group compared to the no abuse/low dissociation group, we have isolated the group that we would theoretically predict to have poorer memory for charged pictures under divided attention; that is, people who have memories to ignore (i.e., abuse) and the means to ignore them (i.e., dissociative abilities).

The overlap of trauma and dissociation among young children deserves additional research, as this topic has important implications for understanding the development of dissociation throughout childhood. Future research may utilize different measures of dissociation (e.g., the Child Dissociative Checklist; Putnam, Helmers, & Trickett, 1993) to investigate relations between dissociation, attention and memory for threat-related information. Future research that investigates the kinds of environments that are associated with the use of divided attention and the failure to recall threat-related information may clarify the extent to which betrayal trauma is related to the use of divided attention and dissociation.

A challenge of future research is to include children who are experiencing ongoing, secretive family abuse in studies of attention and memory. Although most studies on child abuse involve children who are identified to children's services, most studies of adults have them report on their own abuse retrospectively. There are likely meaningful differences between these two samples, making it difficult to compare results from studies of children to those of adults. For example, betrayal trauma theory predicts that it is those children who are actively hiding abuse being perpetrated by caregivers who are most likely to fail to remember abuse. To replicate the findings about adults who grew up in these environments, it is important to include children who are experiencing similar situations. Children who are experiencing overwhelming trauma of many kinds (physical abuse, neglect and sexual abuse) may have very different reactions to abuse, as well as to any involvement with children's protection services.

Future research may also address the limitations of this study. This study relied on parent report measures of trauma history and children's dissociation. Gathering additional information from preschool teachers and caregivers would improve measurement of key variables, including trauma history and dissociation. A larger sample size would allow for more complete comparisons among four groups of children: low dissociators with no trauma history, low dissociators with trauma history, high dissociators with no trauma history and high dissociators with trauma history.

Further research may examine whether the charged pictures were more or less salient for traumatized and non-traumatized children. If the charged pictures were less salient for traumatized children, this might help explain traumatized children's lack of memory for the charged pictures compared to non-traumatized children. Results of a recent study with adults show no differences in high and low dissociators' familiarity

with trauma words (e.g., rape, incest) or non-trauma words (DePrince & Freyd, 1999). Similar research with children will be helpful in understanding how traumatized and non-traumatized children interpret trauma-related stimuli.

In conclusion, the results of this study are consistent with adult studies, in that children who live in abusive homes may develop divided attention skills that may facilitate coping by keeping threatening information out of awareness. Understanding the development of this process throughout childhood has important implications for basic attention and memory research, as well as for children's mental health and education.

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