CHILD DISSOCIATIVE CHECKLIST

(V3.0 – 2/90)

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Date: _____ Age: _____ Sex: M F Identification: _____

Below is a list of behaviors that describe children. For each item that describes your child **NOW** or **WITHIN THE PAST 12 MONTHS,** please circle **2** if the item is **VERY TRUE** of your child. Circle **1** if the time is **SOMEWHAT** or **SOMETIMES TRUE** of your child. If the item is **NOT TRUE** of your child, circle **0**.

0 1 2 1. Child does not remember or denies traumatic or painful experiences that are known to have occurred.

0 1 2 2. Child goes into a daze or trance-like state at times or often appears "spaced-out". Teachers may report that he or she 'daydreams' frequently in school.

0 1 2 3. Child shows rapid changes in personality. He or she may go from being shy to being outgoing, from feminine to masculine, from timid too aggressive.

0 1 2 4. Child is unusually forgetful or confused about things that he or she should know, e.g. may forget the names of friends, teachers or other important people, loses possessions or gets lost easily.

0 1 2 5. Child has a very poor sense of time. He or she loses track of time, many think that it is morning when it is actually afternoon, gets confused about what day it is, or becomes confused about when something happened.

0 1 2 6. Child shows marked day-to-day or even hour-to-hour variations in his or her skills, knowledge, food preferences, athletic abilities, e.g. changes in handwriting, memory for previously learned information such as multiplication tables, spelling, use of tools or artistic ability.

0 1 2 7. Child shows rapid regressions in age-level of behavior, e.g. a twelve year-old starts to use baby-talk, sucks thumb or draws like a four year-old.

0 1 2 8. Child has a difficult time learning from experience, e.g. explanations, normal discipline or punishment do not change his or her behavior.

0 1 2 9. Child continues to lie or deny misbehavior even when the evidence is obvious.

0 1 2 10. Child refers to him or herself in the third person (e.g. as she or her) when talking about self, or at times **insists** on being called by a different name. He or she may also claim that things that he or she did actually happened to another person.

0 1 2 11. Child has rapidly changing physical complaints such as headache or upset stomach. For example, he or she may complain of a headache one minute and seem to forget all about it the next.

0 1 2 12. Child is unusually sexually precocious and may attempt age-inappropriate sexual behavior with other children or adults.

0 1 2 13. Child suffers from unexplained injuries or may even deliberately injure self at times.

0 1 2 14. Child reports hearing voices that talk to him or her. The voices may be friendly or angry and may come from "imaginary companions" or sound like the voices of parents, friends or teachers.

0 1 2 15. Child has a vivid imaginary companion or companions. Child may insist that the imaginary companion(s) is responsible for things that he or she has done.

0 1 2 16. Child has intense outbursts of anger, often without apparent cause and may display unusual physical strength during these episodes.

0 1 2 17. Child sleepwalks frequently.

0 1 2 18. Child has unusual nighttime experiences, e.g. may report seeing "ghosts" or that things happen at night that he or she can't account for (e.g. broken toys, unexplained injuries.)

0 1 2 19. Child frequently talks to him or herself, may use a different voice or argue with self at times.

0 1 2 20. Child has two or more distinct and separate personalities that take control over the child's behavior.

Dissociation in Children and Adolescents

A Developmental Perspective

FRANK W. PUTNAM, MD

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SCREENING MEASURES AND INTERVIEWS FOR PATHOLOGICAL DISSOCIATION IN YOUTHS

An essential feature of the Robins and Guze (1970) model for the validity of a disorder is the existence of "laboratory tests" that serve as external validators for a given diagnosis (see the discussion of validity in Chapter Five). Unfortunately, no one has yet developed a reliable and valid laboratory test for any major psychiatric disorder. In the absence of laboratory standards, clinicians employ dimensional scales and questionnaires, as well as structured diagnostic interviews. Such measures improve the reliability of psychiatric classification and insure a greater consistency in the way in which psychiatric diagnosis is conducted. Nonetheless, psychiatric diagnosis still leaves much to be desired.

Validated dissociative screening measures and structured diagnostic interviews for adults have reshaped the field. (See the discussion of the measurement of dissociation in Chapter Four.) In the early to mid-1980s, a number of clinicians independently generated symptom profiles to aid in identifying dissociative children and adolescents (e.g., Elliot, 1982; Fagan and McMahon, 1984; Kluft, 1985a; Putnam, 1985b). Comparisons revealed many similarities in the features that their authors thought salient to pathological dissociation in children (see discussions in Putnam, 1986b; Peterson, 1990). Items from these early predictor lists constitute the core of current child and adolescent dissociation scales and interviews (Evers-Szostak and Sanders, 1992; Reagor et al., 1992; Tyson, 1992; Putnam et al., 1993). Here, I focus the bulk of my discussion on those measures with which I am most familiar—namely, those that I have authored or coauthored.

The Child Dissociative Checklist

The CDC is derived from a symptom profile that I circulated among child protection workers in 1981. Early versions were published as footnotes or tables by other authors (e.g., Elliot, 1982; Kluft, 1985a) prior to our validation article (Putnam et al., 1993). The most commonly encountered versions are labeled "2.2—2/88" and "3.0—2/90." The former is a 16-item checklist. The latter has 20 items, which include all of the Version 2.2 items in the same order, permitting easy comparison. I encourage readers to copy and use the CDC. It is a public domain document and may be reproduced and distributed without special permission. A reproducible copy is included in Appendix Two. (Readers who wish to tinker with it should change the name to reduce confusion for others.)

The CDC is an observer report measure and uses a 3-point scale response format (i.e., 2 = "very true," 1 = "somewhat or sometimes true," and 0 = "not true"). The time frame in the instructions covers the present and the prior 12 months. Clinicians are free to specify another time frame as appropriate (e.g., the preceding week) when the CDC is completed weekly as part of a longitudinal evaluation or treatment outcome measure.

The CDC score is the sum of all of the item scores and can range from 0 to 40 on Version 3.0. Table 12.3 gives scores for different groups of children by age. The table shows that healthy, nonmaltreated normal children generally score very low on the CDC, with younger children scoring slightly higher. As a group, maltreated children score significantly higher than normals; however, they score significantly below children with diagnosable dissociative disorders. MPD children score uniformly high at each age point, with DDNOS children falling close below on average. The large standard deviations in the pathological groups indicate

TABLE 12.3. CDC Scores for Different Groups by Age

Group	Age (years)	Mean	*SD*	*n*
Normal	5–8	3.2	2.9	54
	9–11	2.9	1.0	42
	12–16	1.9	1.9	96
Maltreated	5–8	10.3	8.7	39
	9–11	6.1	6.5	87
	12–16	4.2	1.9	129
MPD	5–8	24.1	8.5	9
	9–11	23.8	9.7	12
	12–16	22.3	9.1	26
DDNOS	5–8	21.4	9.1	19
	9–11	16.5	6.9	8
	12–16	20.0	8.0	19

that a wide range of scores can be expected with a subgroup of high scorers. As a general rule of thumb, a score of 12 or higher is considered an indication of pathological dissociation, and further evaluation is warranted.

Reliability and Validity

Several studies of the reliability and validity show the CDC to be a reliable instrument. For example, the mean Cronbach's alpha was .86 in three studies, and the mean test–retest reliability was .74 in two studies (Malinosky-Rummell and Hoier, 1991; Putnam et al., 1993; Putnam and Peterson, 1994; Wherry, Jolly, Feldman, Adam, and Manjanatha, 1994).

The validity of the CDC has been primarily assessed in terms of its ability to discriminate among groups. Studies to date have found that sexually abused children score significantly higher than nonabused comparison children (Malinosky-Rummell and Hoier, 1991; Putnam et al., 1993; Wherry et al., 1994). Three studies indicate that the CDC can discriminate children with dissociative disorders from abused and nonabused children without dissociative disorders. In three studies (Hornstein and Putnam, 1992; Putnam et al., 1993; Putnam and Peterson, 1994), children with MPD had median scores of 25, 24, and 25, respectively, whereas children with DDNOS had median scores of 16.8, 16.5, and 18.2, respectively. In one study (Putnam and Peterson, 1994),

scores on the CDC as completed by parents and caretakers were significantly correlated with scores on item-equivalent dissociation scales completed by the children's primary therapists. Clinicians using the CDC typically report similar results. For example, the mean scores for diagnostically mixed groups of child and adolescent dissociative patients were 16.6 and 23, respectively, in two recent studies (Coons, 1996; Yeager and Lewis, 1996). In sum, the CDC has proven to be internally consistent, reliable over time, and generally able to discriminate children with pathological dissociation from those without.

Cautions

A number of cautions should be kept in mind. First, the CDC scores reported in Table 12.3 are means; they reflect the "average" child in a given group. Second, individual children (both traumatized and nontraumatized) can and do exhibit variation on the CDC, as well as on other measures. Thus a high score does not prove that a child has a dissociative disorder; nor does a low score guarantee that a child does not have a dissociative disorder. In addition, there is variability in the way in which adult report measures such as the CDC are completed by parents, foster parents, teachers, and other informants. This problem exists for all adult report child measures. Finally, the CDC is but an indicator of the presence or absence of pathological dissociation. High and low scores must be weighed within the larger clinical context. Therefore, the CDC is best used as a screening instrument for detection of possible pathological dissociation during evaluation, and as an index of a degree of dissociation for purposes of research and treatment evaluation.

Factors Influencing Scores

Developmental and individual variables (e.g., age, gender, ethnicity, parental education, etc.) must be factored into an interpretation of a CDC score. (See the discussion of age and gender effects in Chapter Nine.) In general, CDC scores decrease with age (Putnam, 1996a). Current data suggest that the rate of this decline varies across normal and clinical groups. Our findings indicate that nontraumatized children, even at young ages, have very low scores. Between the ages of 6 and 16, the decline in CDC scores is modest but significant, $r\ (134) = -.19$, $p = .02$. The age-related decline in scores for maltreated children is actually somewhat steeper, $r\ (121) = -.34$, $p = .0001$. Children with dissociative disorders (MPD and DDNOS), particularly those with MPD, show essentially no decline in CDC scores over the same age range. Thus, for

most groups CDC scores do decline with age, but in the most extreme cases they do not.

We know less about the effects of gender and culture on CDC scores. I am certain that these factors influence reported scores in some cases, and probably more so for children than for adults. Certain social behaviors that the CDC inquires about (e.g., sexual and aggressive behaviors) also differ significantly by gender and probably often by culture, although little is known about these factors.

Research Uses

The CDC is designed to be both a clinical and a research tool. As new information is rapidly accruing, researchers should review the most current literature before embarking on a CDC study. In general, the CDC can be used to quantify dissociative behavior for dimensional approaches and to generate cutoff scores to categorize children into low- and high-dissociation groups.

Clinical Uses

The CDC is employed clinically in three basic ways. Its first use is as a routine screening instrument given in a clinical setting. For example, parents can be asked to fill out the CDC, together with other parent report measures such as the Child Behavior Checklist (CBCL), when they bring their child for evaluation/treatment. In selected cases, the CDC can be sent to teachers or others who know the child reasonably well. When filling out the scale, teachers should be told to ignore items 17 and 18, which inquire about nocturnal behavior. After a period of observation on inpatient units, designated staff members can complete the CDC for an assigned child. Again, allowances should be made for an observer's familiarity with the child, particularly across different staff shifts. As noted above, the source and reliability of all scores need to be considered in the clinical context.

Second, for finer-grained screening, the CDC can be serially completed by a designated observer. For children in whom there is reason to suspect pathological dissociative behaviors, parents, foster parents, or others can complete the CDC weekly or monthly for a period of time. In nondissociative children, there is often a small increase (1–3 points) over the first few completions, because the questions draw attention to minor dissociative behaviors that were previously ignored. Clinicians should be looking for evidence of sustained pathological dissociation—that is,

for CDC scores that are consistently 12 or higher (e.g., see the case of Penni, Chapter Eleven and Figure 11.1).

When using the CDC in this fashion, I ask parents to keep a log of examples of the behaviors that they are endorsing on the CDC. I review this with them as a quality check on how they are completing the scale. As with any measure, questions on the CDC can be misunderstood. However, I find that parents use the scale pretty much as intended, and that they rarely endorse items inappropriately. The consistently low scores for normal subjects across different studies support this.

Lastly, the CDC can be used as a rough index of treatment progress. There is less experience with this mode, but preliminary results indicate that the CDC provides a reasonable indication of whether or not a child is improving with time or treatment. In several acute trauma cases elevated CDC scores declined to normal ranges over a 2- to 3-month period, supporting clinical observations that the children were improving. In other instances (e.g., the case of Penni), repeated administations of the CDC over several years suggested that little improvement occurred.

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MEASUREMENT ISSUES

Pathological Dissociation as Measured by the Child Dissociative Checklist

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The component structure of the Child Dissociative Checklist was examined among abused children. A factor described as pathological dissociation emerged that was predicted by participants being male. There also were differences in pathological dissociation between groups of sexually abused and physically abused children. Replication of this factor and the establishment of base rates for various groups of children are recommended so that the Child Dissociative Checklist might be used to more effectively eliminate false positives and increase true positives in the screening and ultimate treatment of dissociative children.

KEYWORDS child abuse, dissociation, assessment, diagnosis

Dissociation has been described by Putnam, Helmers, and Trickett (1993) as a psychophysiological process occurring along a continuum from minor normative dissociations (e.g., daydreaming) to psychiatric conditions such as dissociative identity disorder (DID). Studies of patients with dissociative disorders yield a high percentage of cases (85–100%) with reported traumatic childhoods (Coons, Bowman, & Milstein, 1988; Putnam, Guroff, Silberman, Barban, & Post, 1986) and child abuse (Chu & Dill, 1990). Moreover, dissociation is significantly correlated with severity of trauma, with the magnitude of correlations ranging from approximately .25 to .45 (Anderson,

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Yasenik, & Ross, 1993; Branscomb, 1991; Carlson & Rosser-Hogan, 1991; Chu & Dill, 1990; Kirby, Chu, & Dill, 1993; Sandberg & Lynn, 1992).

As noted, dissociation appears related to the severity of trauma, but it also is predicted by age, gender, duration, and the nature of the sexual abuse. That is, dissociation as measured by the Child Dissociative Checklist (CDC; Bernstein & Putnam, 1986) and the Trauma Symptom Checklist for Children (TSCC; Briere, 1996) was predicted by being older, being female, by abuse occurring over a longer period of time, and the nature/severity of sexual abuse (Friedrich, Jaworski, Huxsahl, & Bengston, 1997). Confirmation of dissociative symptomatology in a child client is relatively uncommon (Kluft, 1984, 1985; Putnam, 1991; Vincent & Pickering, 1988) despite acknowledgement that multiple personality disorder (MPD) or DID often originate in childhood. In fact, less than 3% of the diagnoses of a dissociative disorder are made in children under 12, and less than 8% are made in adolescents between the ages of 12 and 19 (Kluft, 1984).

Putnam (1997) reviewed two models for understanding both normal and pathological dissociation. The continuum model holds that dissociation is a normally distributed spectrum of experiences and behaviors. In contrast, the taxon model posits that normal and pathological dissociation are of a different type. Specifically, pathological dissociation involves experiences rarely or never experienced by normal people. Putnam also suggested that normal and pathological dissociation predict developmental trajectories that are fundamentally different.

Pathological dissociation is characterized by disruptions in the sense of identity and disturbances of memory (Nemiah, 1980). Similarly, Putnam (1997) describes pathological dissociation as a disturbance in the integrative functions of identity, memory, and consciousness. Dorahy, Lewis, Millar, and Gee (2003) also note that pathological or nonnormative dissociation includes amnesia and depersonalization, where nonpathological dissociation is represented by constructs like imaginative involvement and absorption. Waller and Ross (1997) studied the prevalence of pathological dissociation in a large random sample of 1,055 adults and found that 3.3% of the sample experienced pathological dissociation. Similarly, Maaranen et al. (2005) found that 3.4% of a large stratified sample of adults in Finland experienced pathological dissociation. Maaranen et al. also found that there was a relationship between pathological dissociation and depression, suicidality, and alexithymia.

Although pathological dissociation has received some attention in the adult literature, its measurement among children is virtually nonexistent. Measurement and recognition of pathological dissociation early in life would be important because treatment of dissociation is much more successful in childhood (Kluft, 1984). The CDC (Bernstein & Putnam, 1986) has been developed as a screening measure to assess dissociative symptoms in children according to parent reports. The purpose of the study was to

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determine if children assessed by the CDC could be described as evidencing a taxon described as pathological dissociation similar to that described for and applied to adults. Moreover, this study aimed to examine whether groups of abused children would differ in pathological dissociation based on abuse status and whether pathological dissociation would be predicted by variables described in the adult literature as related to pathological dissociation (e.g., gender, duration, severity).

METHOD

Participants

Participants were parents of 232 physically and sexually abused children between the ages of 6 and 13. They were recruited primarily from a children's hospital serving a largely rural state. Sixty-one percent of the abused children were girls and 39% were boys; 69% were Caucasian and 31% were African American. The mean age of the children was 9.96 (*SD* = 1.69). Demographic data for the parents were not collected.

Participants were included if their children provided a clear disclosure of physical or sexual abuse, if the child's report was acknowledged as credible by the nonoffending caretaker, and at least one of the following external supportive factors was met: (a) official substantiation by the state child protective services agency, (b) abuser admission of abuse, (c) physical evidence strongly consistent with abuse, or (d) trained interviewer conclusion that physical or sexual abuse was likely.

Parents completed informed consent and children provided assent. The measures were collected as part of a larger study supported by the National Institute of Mental Health. Only 16% of all participants screened were recruited. Many caregivers refused to participate, and some children did not endorse abuse despite confirmation by another source.

Children and parents were interviewed separately. For many, multiple sessions were required to complete the measures. Children were screened to assure an overall IQ of at least 75 on the Slosson Intelligence Test-Revised (SIT-R; Slosson, Nicholson, & Hibpshman, 1990) or Kaufman Brief Intelligence Test (KBIT; Kaufman & Kaufman, 1990). IQ scores averaged 98.09 (*SD* = 16.16).

Instruments

Abuse dimensions inventory

The Abuse Dimensions Inventory (ADI; Chaffin, Wherry, Newlin, Crutchfield, & Dykman, 1997) is a 15-scale instrument designed to measure the severity of physical and sexual abuse. The sexual abuse section, which was the only

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section utilized in the present study, has scales measuring sexual behavior severity, duration of abuse, number of most severely rated incidents, number of total incidents, abuser reaction to disclosure, use of force or coercion to gain submission or compliance, use of force or coercion to gain secrecy, and relationship of the abuser to the victim. The ordering of items in terms of severity was obtained by surveying a national sample of mental health professionals belonging to a national abuse organization. Coefficients of concordance for orderings averaged .87. Interrater reliability of the scales based upon a semistructured interview with non-accused parents ranged from .84 to .99, and factor analysis of the instrument produced a four-factor solution with separate factors for physical abuse behaviors, sexual abuse behaviors, number and duration of physical abuse events, and number and duration of sexual abuse events (Chaffin et al., 1997).

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Child dissociative checklist, version 3.0

The CDC is a screening measure developed by Putman and colleagues (1993) to access dissociative symptoms based on ratings by caregivers for children and adolescents. The CDC is comprised of 20 items rated on a scale ranging from 0 (not true) to 2 (very true). These ratings are summed, and a cutoff score equal to or greater than 12 is considered abnormal, particularly in older children. It has a one-year test-retest reliability coefficient of rho = .69 (N = 73, p = .0001) in a sample of normal and sexually abused girls. Putman and colleagues (1993) report good discriminant validity for the CDC.

RESULTS

Principal Components of the CDC with Physically and Sexually Abused Children

In order to explore the principal components of the CDC, a principal components analysis of the 20 CDC items was undertaken. The sample included both physically and sexually abused children (N = 232). The Kaiser-Meyer-Olkin measure of sampling adequacy was .857, indicating that the data were appropriate for principal components analysis. A varimax rotation was performed. Based on examination of the scree plot, a three-factor solution resulted and accounted for 46% of the variance. The factors included items describing variability in a number of behaviors, general externalizing problems, and pathological dissociation (see Table 1). The variability component accounted for 19.09% of the variance, the pathological dissociation component accounted for 14.12%, and the externalizing behavior component accounted for 12.88%.

TABLE 1 Rotated Component Matrix of the CDC

CDC Items	Rotated Component Matrix		
	Variability	Pathological	Externalizing
6. Child shows marked variations in skills, knowledge, food preferences, etc.	**.721**	.186	.015
3. Child shows rapid changes in personality.	**.690**	.051	.255
4. Child unusually forgetful or confused about things that he/she should know.	**.670**	.151	.219
11. Child has rapidly changing physical complaints.	**.639**	.001	.070
7. Child shows rapid regressions in age level of behavior.	**.607**	.329	.151
2. Child goes into daze or trancelike state; spaced out/daydreams.	**.592**	.016	.303
5. Child has poor sense of time; loses track of time.	**.588**	.273	.159
18. Child has unusual nighttime experiences.	**.560**	.381	.025
1. Child doesn't remember/denies traumatic experiences.	**.402**	.313	.361
15. Child has a vivid imaginary companion(s).	.029	**.749**	.086
20. Child has two or more distinct and separate personalities that take control.	.328	**.648**	.036
17. Child sleepwalks frequently.	.072	**.574**	.080
14. Child reports hearing voices that talk to him/her.	.072	**.548**	.242
10. Child refers to himself/herself in third person; insists on being called a different name.	.270	**.548**	.017
19. Child frequently talks to himself/herself (may use different voice or argue with self).	.150	**.541**	.148
9. Child continues to lie or deny misbehavior when evidence is obvious.	.161	.015	**.803**
8. Child has difficult time learning from experience.	.272	.074	**.768**
12. Child is unusually sexually precocious.	.041	.127	**.608**
16. Child has intense outbursts of anger often without apparent cause (may display unusual physical strength).	.262	.188	**.596**
13. Child suffers from unexplained injuries or may deliberately injure self.	.199	.279	**.364**

Note: Highlighted items represent the factor items.

Table 2 reports the distribution of scores for the items of the pathological dissociation factor. A score of 1 indicates that for one item the behavior was "sometimes true," while a score of 2 indicates that either two items were "sometimes true," or one item was "very true." If a score of 2 is set as a threshold for pathological dissociation, then 85.8% of the sexually abused sample did not evidence pathological dissociation and 14.2% did evidence pathological dissociation.

Reliability

Reliability was calculated for each of the three scales derived from factor analysis. In ascending order, alpha coefficients for the CDC principal

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TABLE 2 Distribution of Pathological Dissociation Raw Scores

	Distribution		
Score	Frequency	Percent	Cumulative Percent
.00 or more	157	67.4	100.0
.00 or more	43	18.5	32.7
.00 or more	16	6.9	14.2
.00 or more	5	2.1	7.3
.00 or more	6	3.6	5.2
.00 or more	2	.9	2.6
.00 or more	2	.9	1.7
.00 or more	1	.4	.8
.00 or more	1	.4	.4

components were .834 for variability in behavior, .696 for pathological dissociation, and .721 for externalizing behavior. The Cronbach's alpha for all items was .873. The item mean was .865.

Predicting Pathological Dissociation

Next, the scores for the six items of the pathological dissociation factor were weighted based on their individual factor loadings relative to the overall factor loading. The weighted pathological dissociation score was then used as the dependent variable in a series of hierarchical regression analyses involving abuse characteristics and demographic variables. These analyses were done using hierarchical multiple regression as outlined in SPSS (software). Each independent variable was entered into the regression equation according to a specific hierarchy. The adjusted *R2* (explained variance) was then analyzed by increments as to the proportion of variance explained after adding each additional variable (Cohen & Cohen, 1975). Predictor variables were entered in the following order: (a) gender, (b) duration, and (c) severity. Only gender was a significant predictor of weighted pathological dissociation, overall $F(1, 134) = 11.47$, $p < .01$, accounting for .08 of the total adjusted *R*2. Male children were more likely to experience pathological dissociation.

Differences between Groups

An independent-samples t-test was performed and yielded significant differences in weighted pathological dissociation between those children who were sexually abused and those who were not. The mean and standard deviations were 5.74 ($SD = 12.39$) for non–sexually abused children and 14.15 ($SD = 28.81$) for sexually abused children. Levene's test of equality of variance indicated that the variance between the groups was not equal, based on an F of 11.68 ($p < .01$). Thus, the resulting t-score was 3.08

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(df = 217.51, $p < .01$). The results of an independent t-test of the weighted pathological dissociation score performed on groups of physically abused and non–physically abused children was nonsignificant.

Weighted item scores were calculated for the variability and externalizing items based on their individual item loadings relative to the overall factor loading. There were significant differences between physically abused children and non–physically abused children on the weighted externalizing factor, $t(231) = 6.52$, $p < .001$ with physically abused children scoring higher ($M = 85.22$, $SD = 45.34$) than non–physically abused children ($M = 40.93$, $SD = 48.73$). On the variability factor, children who were sexually abused ($M = 46.07$, $SD = 45.25$) scored higher than non–sexually abused children ($M = 30.55$, $SD = 37.17$), $t(203.50) = 2.83$, $p < .01$ (Levene's $F = 5.59$, $p < .05$).

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DISCUSSION

For this sample, the CDC can be reduced into three components: pathological dissociation, variability, and externalizing. One of the components, pathological dissociation, appears to assess more serious symptoms of dissociation. Unfortunately, there is no measure that serves as a "gold standard" for the systematic diagnosis of dissociation in young children. However, Kluft (1984) reports that less than 3% of dissociative disorder diagnoses are made in children under age 12. Similarly, Waller and Ross (1997) report that only 3.3% of adults report pathological dissociation. In this sample, 14.2% of sexually abused children evidenced pathological dissociation according to parent reports when a score of 2 was used as the threshold on the pathological dissociation factor. This higher rate of pathological dissociation is to be expected because the participants are drawn from a clinical population rather than a general population.

Differences in weighted pathological dissociation scores were examined between those in the sample who experienced sexual abuse and those who experienced physical abuse. The sexually abused children were rated by their parents as evidencing more pathological dissociation than the physically abused children. Since the physical abuse itself might have been perpetrated by the parent rater, one explanation might be that the physically abusive parent raters were less sensitive and attuned to their child's problems. However, another interpretation is that sexual abuse leads to more pathological dissociation as a traumatic event that is difficult to integrate into one's experience. This is contrary to some findings in the adult literature where physical abuse is related to pathological dissociation more than sexual abuse (e.g., Macfie, Cicchetti, & Toth, 2001).

The finding that pathological dissociation was predicted by being male was partially in contrast to Friedrich and colleague's (1997) finding that being female was related to dissociation in general. This may be due to

higher rates of pathological dissociation among boys or to differences between this sample and the one used by Friedrich and colleagues. Ultimately, the value of the pathological dissociation factor will be fully demonstrated when differences in scores differentiate between groups of normal controls, sexually abused children, and children with a DSM-IV (*Diagnostic and Statistical Manual of Mental Disorder*, Fourth Edition) diagnosis of a dissociative disorder.

As suggested, one of the limitations of the study was the lack of a normal control group. The establishment of base rates of dissociative symptoms, especially pathological dissociation, among normal children would assist in the interpretation of pathological dissociation in abused and clinical populations. Another limitation of the study was the likely bias created because of voluntary nonparticipation by 86% of all potential children screened. This may have resulted in less severe ratings of child behavior and abuse, especially among those children who were physically abused. That is, an undetermined portion of the physically abused children had parents who retained custody of their children and provided the ratings for their children.

Future studies would be beneficial to replicate the pathological dissociation factor and to establish base rates of pathological dissociation scores among normal children, abused groups, children traumatized by other events, and clinical populations. By refining our screening of dissociation through the specific assessment of pathological dissociation, clinicians might improve on the accurate identification of those with dissociative symptoms versus those who represent false positives in the screening process. Ultimately, this may lead to more timely and appropriate treatment of children.

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Article

Dissociation as a Mediator of Psychopathology Among Sexually Abused Children and Adolescents

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Objective: This study investigated the role of dissociation as a mediator of mental health outcomes in children with a history of sexual abuse.

Method: The study group consisted of 114 children and adolescents (ages 10–18 years) who were wards of the Illinois Department of Children and Family Services and were living in residential treatment centers. Interviews, provider ratings, and chart reviews were used to assess the relationship of childhood abuse history, dissociative responses, and psychopathology.

Results: Sexual abuse history was significantly associated with dissociation, whereas a history of physical abuse was not. Both sexual abuse and dissociation were independently associated with several indicators of mental health disturbance, including risk-taking behavior (suicidality, self-mutilation, and sexual aggression). Severity of sexual abuse was not associated with dissociation or psychopathology. Analysis of covariance indicated that dissociation had an important mediating role between sexual abuse and psychiatric disturbance. These results were replicated across several assessment sources and varied perspectives.

Conclusions: The findings suggest a unique relationship between sexual abuse and dissociation. Dissociation may be a critical mediator of psychiatric symptoms and risk-taking behavior among sexually abused children. The assessment of dissociation among children may be an important aspect of treatment.

(Am J Psychiatry 2001; 158:1034–1039)

Childhood sexual abuse may be related to more deleterious long-term outcomes than physical abuse (1–4). However, no psychiatric profile or course of adjustment unique to the sexual abuse survivor has been identified. Depression, anxiety, and somatic and sexualized responses are frequently documented (5, 6). Risk-taking behaviors (e.g., suicidality, self-mutilation, physical and sexual aggression, substance abuse, and sexual revictimization) have also been noted (7–10). Yet symptoms can wax and wane or shift over the course of development (5, 11), making it difficult to interpret the "real" effect of sexual trauma (12).

While the symptomatic effects of sexual abuse are well-studied (6, 11), the possible mediators of the complex relationship between childhood abuse and psychopathology are currently a focus (11–14). Included is an emphasis on the coping responses of abuse survivors.

A number of studies have assessed the relationship between childhood abuse and dissociation among adult survivors (1–4, 10, 15–17), but this relationship has been less studied among children. The majority of studies suggest that sexual abuse, particularly severe sexual abuse, compared to physical abuse, has the predominant effect on dissociation (2–4, 10, 16). However, other studies have pointed to higher levels of dissociation among subjects with physical abuse or combined sexual and physical abuse (1, 15). Some of this inconsistency may be associated with differences in defining abuse or its severity as well as with difficulties substantiating reports of sexual abuse (16).

A natural, protective response to overwhelming traumatic experiences, dissociation can become an automatic response to stress. This can impair functioning and increase susceptibility to serious psychopathology (17, 18). Putnam (12) has suggested that aggressive, risk-taking behavior often occurs in the context of dissociative experiences, when individuals feel out of control and compelled to do something against their will. A hierarchical model of dissociation proposes that primary dissociation (e.g., forgetfulness, fragmentation, emotional numbing) often co-occurs with several symptom constellations (e.g., mood swings, aggressive behavior, substance abuse). These symptoms are considered secondary or tertiary responses to dissociation in which dissociation serves as a mediator (12). These observable symptoms or risks may not manifest until adolescence or early adulthood (18).

Dissociation and development appear related. Normative dissociation peaks during latency years (age 10) and declines through adolescence and adulthood (17). While some consider pathological dissociation to exist only in adults, adolescence may be a transition period critical to understanding the development of pathological dissociation (18). The early identification of dissociative re-

sponses, particularly in relation to risk-taking behavior, may provide important avenues for prevention.

The present study assessed the role of dissociation in the presence of psychiatric symptoms among a group of adolescents and pre-adolescent children with experiences of sexual and physical abuse. It was hypothesized that dissociation would have a mediating role between sexual abuse and mental health outcomes, particularly increasing the likelihood of behaviors that are harmful to self or others.

Method

Study Group and Procedure

One hundred fourteen subjects, ages 10 to 18, were recruited from a group of children who were wards of the State of Illinois Department of Children and Family Services. The group was recruited on the basis of the following five criteria: 1) removal from family and placement into Department of Children and Family Services custody, 2) current placement in residential treatment, 3) age, 4) proximity to Chicago, and 5) agreement to participate. Each child lived in one of five state-supervised residential treatment centers. Two of the residential treatment centers included groups of children treated specifically for sexual aggression. The child's primary residential treatment caseworker was asked to participate in the study as the caregiver, i.e., an informant who knew the child well. Subjects were not recruited on the basis of any specific abuse history. Children were screened for their ability to participate by staff at each site and were then selected for the study if they agreed to participate. Written informed consent was obtained from both the child and the Public Guardian in Illinois.

The study group included 59 male (52%) and 55 female (48%) subjects. The majority were African American (69%), with 24% Caucasian and 5% Hispanic. The average length of stay in the residential treatment center was 15.2 months (SD=12.2). The mean full-scale IQ was 82 (SD=15), but the range of IQ scores (range=50–125) suggests that the mean score likely was not reflective of the overall study group.

Children were administered the Adolescent Dissociative Experiences Scale (18) by a clinically trained interviewer and were asked to complete the Youth Self-Report (19). Caregivers were asked to complete the Child Dissociative Checklist (20), the Child Behavior Checklist (21), the Child Acuity of Psychiatric Illness scale (22), and the History of Abuse Form. Trained raters used the Child Severity of Psychiatric Illness scale (22) to review residential charts.

Measures

Dissociation. Two measures of dissociation were used. The Adolescent Dissociative Experiences Scale (18) is a 30-item self-report measure developed as a screening tool for serious dissociative and posttraumatic disorders. Each item is rated on a scale of 0 (never) to 10 (always) on the basis of adolescents' self-report of symptoms. The total score for the scale is the average of all item scores. Psychometric data on the Adolescent Dissociative Experiences Scale indicate excellent reliability (Cronbach's alpha=0.93; split-half=0.92). A mean score of 4 or above on the Adolescent Dissociative Experiences Scale signifies pathological dissociation.

The Child Dissociative Checklist (20) is a 20-item observer-report checklist with a 3-point scale (0=not true, 1=sometimes true, 2=frequently true). The Child Dissociative Checklist is a clinical screening instrument that assesses dissociation on the basis of ratings given by caregivers or adults in close contact with the child. A score of 12 or higher on the Child Dissociative Checklist is evidence of pathological dissociation. The Child Dissociative Checklist shows good 1-year test-retest stability (r=0.65) and internal consistency (Cronbach's alpha=0.86) (20). Good convergent and discriminant validity have been indicated (20).

Traumatic experiences. The History of Abuse Form was completed by caregivers. The History of Abuse Form included items abbreviated from another measure (23) and incorporated variables associated with severity of sexual abuse in the literature (5, 6), including type of sexual abuse, age at onset, frequency and duration, relationship and emotional closeness of the perpetrator, and use of force. These data were reported secondhand by the primary caseworker and, therefore, must be interpreted with caution. Asking the youth directly was seen as too intrusive. File review was seen as insufficiently detailed. Information on physical abuse and neglect was also collected.

Mental health outcomes. The Child Behavior Checklist (21) is a 113-item, 0–2 point, observer-report measure. The items comprise several factor-analytically derived problem scales, competence scales, two broadband groupings (internalizing and externalizing problems), and a total problem scale. The Child Behavior Checklist is widely used, with excellent reliability and validity (21). The counterpart to the Child Behavior Checklist, the Youth Self-Report (19), is a child self-report measure with the same scale format and content. The Youth Self-Report exhibits adequate reliability and validity (19).

The Child Acuity of Psychiatric Illness scale (22) is a 21-item, 4-point measure designed to rate acute mental health symptoms, subject to change on the basis of interventions. The Child Acuity of Psychiatric Illness scale includes dimensions of risks, symptoms, functioning, and systems support. The Child Severity of Psychiatric Illness scale (22) is a 25-item, 4-point measure, similar in nature and format to the Child Acuity of Psychiatric Illness scale. It is a chart review measure used to gather recent and historical information on psychiatric functioning.

Results

Eight of the 114 subjects were missing data because of either the child's unwillingness to complete certain measures or the caregiver's failure to return the questionnaires (despite multiple requests). This accounts for the variation in number of subjects across measures.

Types of Childhood Abuse Experiences

According to the chart review, 97% of the study group had a history of any type of abuse (sexual, physical, neglect), and 84% of the subjects had an abuse history that was considered moderate to severe. According to the History of Abuse Form, most of the group (92%) experienced some neglect, with 42% experiencing severe neglect or abandonment. Sixty-one percent had a history of sexual abuse, 47% experienced physical abuse, and 39% had both. Children who experienced only sexual abuse without physical abuse made up 22%, while 16% had a history of physical abuse alone, and 49% witnessed the physical abuse of family members.

Among those who reported a history of sexual abuse, the following types of sexual contact were reported: sexual kissing or fondling (11%), touching genitals/digital penetration (16%), oral sex (9%), and genital or anal intercourse (64%). The age at onset of sexual abuse fell into one of four ranges: 0–2 years (4%), 3–6 years (46%), 7–11 years (43%),

TABLE 1. Dissociation and Psychopathology in 114 Children and Adolescents Living in State-Supervised Residential Treatment Centers, by Abuse History

	Abuse History							
	No Abuse (N=27)		Sexual Abuse (N=25)		Physical Abuse (N=18)		Sexual/Physical Abuse (N=44)	
Measure	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Dissociation								
Adolescent Dissociative Experiences Scale score	2.4	2.0	3.4	2.6	2.4	1.8	3.7	2.1
Child Dissociative Checklist score	4.7	3.4	6.0	4.8	6.2	6.1	10.4	6.9
Psychopathology								
Child Behavior Checklist scores								
Total	56.2	10.5	62.2	10.5	60.1	13.1	67.2	10.2
Internalizing problems[a]	53.6	10.6	59.6	12.0	55.5	12.8	64.6	10.5
Externalizing problems[b]	58.4	10.7	62.3	8.7	61.8	13.3	66.9	10.4
Youth Self-Report scores								
Total	58.8	14.1	63.0	14.7	56.0	15.0	64.4	11.4
Externalizing problems[b]	60.8	13.2	62.0	13.5	56.6	15.2	66.3	12.6
Child Acuity of Psychiatric Illness scores								
Total	9.0	5.8	13.3	8.8	10.9	10.4	18.8	10.5
Symptoms	3.9	3.6	5.1	3.8	4.7	5.2	7.8	4.8
Risks	1.3	1.3	1.8	2.6	1.2	2.0	2.7	2.2
Child Severity of Psychiatric Illness scores								
Sexual aggression	0.6	0.9	1.0	1.2	0.1	0.3	1.4	1.1
Suicide	0.3	0.5	0.6	0.8	0.3	0.5	0.6	0.6

[a] Items from the withdrawal, somatic complaints, and anxious/depressed syndromes within the scale.
[b] Items from the delinquent and aggressive behavior syndromes within the scale.

or 12 years and above (7%). The length of abuse varied: 0–1 year (29%), 1–3 years (36%), 3–5 years (19%), 5 years or more (16%). The frequency of the abuse ranged from either one occasion (8%) or rarely but more than once (26%) to monthly (15%), weekly (38%), and daily (13%). The majority of victims were related to their abuser (who was either an immediate family member [44%] or extended family member [29%]); 4% of the abusers were strangers to the victim, and 23% were unrelated but known. The degree of emotional closeness to the perpetrator was described as follows: no relationship (16%), distant relationship (23%), moderately close (41%), and extremely close (20%). The prototypical picture of sexual abuse was weekly genital or anal intercourse by a family member to whom the child was at least moderately emotionally close, lasting between 1 and 3 years. When multiple types of sexual abuse were reported for a given child, the most severe type was used.

Dissociation

The scores from the Adolescent Dissociative Experiences Scale (mean=3.2, SD=2.2) and Child Dissociative Checklist (mean=7.6, SD=6.2) were positively correlated with each other ($r=0.28$, $df=100$, $p<0.01$). The magnitude of this correlation suggests that these constructs may not be highly related. It is unclear whether these two measures assess the same phenomenon: children's report of their own internal experience versus adults' perception of this experience. Therefore, for the purposes of distinction, we refer to the Adolescent Dissociative Experiences Scale score as "experienced dissociation" and the Child Dissociative Checklist score as "perceived dissociation."

There were no significant findings for age and dissociation. There were some gender differences in dissociation: female subjects reported significantly higher levels of experienced dissociation ($t=1.95$, $df=105$, $p<0.05$).

Abuse and Dissociation

In order to identify the differential effects of sexual and physical abuse experiences, a two-by-two analysis of variance (ANOVA) was used. Main effects were tested for sexual abuse (yes versus no) and physical abuse (yes versus no). Statistical interactions between sexual and physical abuse were also tested to determine whether the co-occurrence of sexual abuse and physical abuse had differential effects greater than the occurrence of either sexual abuse or physical abuse alone. Mean scores on the dissociation measures for the 114 subjects grouped by abuse history (no abuse, sexual abuse only, physical abuse only, both sexual and physical abuse) are presented in Table 1.

For experienced dissociation (i.e., scores on the Adolescent Dissociative Experiences Scale), there was only a main effect for sexual abuse: children with sexual abuse histories reported significantly higher levels of dissociation ($F=6.88$, $df=1, 103$, $p<0.01$). There was no effect for physical abuse and no interaction effect. For perceived dissociation (i.e., scores on the Child Dissociative Checklist), both main effects were significant: higher levels of perceived dissociation were seen in children with a history of either physical abuse ($F=6.40$, $df=1, 103$, $p<0.05$) or sexual abuse ($F=5.54$, $df=1, 103$, $p<0.05$). There was no interaction effect. There was also no relationship between circumstances or severity of sexual abuse and dissociation.

Abuse and Psychiatric Status

Again, two-by-two ANOVAs were conducted across the measures of symptomatic functioning, with physical

TABLE 2. Correlations Between Dissociation and Mental Health Outcome Measures in 114 Children and Adolescents Living in State-Supervised Residential Treatment Centers

	Dissociation Measure			
	Adolescent Dissociative Experiences Scale		Child Dissociative Checklist	
Mental Health Outcome Measure	r (df=88–106)	p	r (df=88–106)	p
Psychiatric symptoms				
Child Behavior Checklist scores				
Total	0.27	0.01	0.83	0.01
Internalizing problems[a]	0.22	0.01	0.70	0.01
Externalizing problems[b]	0.16		0.72	0.01
Youth Self-Report scores				
Total	0.58	0.01	0.22	0.05
Internalizing problems[a]	0.53	0.01	0.15	
Externalizing problems[b]	0.48	0.01	0.24	0.05
Child Acuity of Psychiatric Illness: total score	0.25	0.05	0.72	0.01
Risk-taking behavior				
Child Severity of Psychiatric Illness scores				
Risks	0.13		0.34	0.01
Suicide risk	0.37	0.01	0.10	
Sexual aggression	0.15		0.36	0.01
Child Acuity of Psychiatric Illness scores				
Risks	0.07		0.60	0.01
Suicidal gesture	0.17		0.41	0.01
Self-mutilation	0.21	0.05	0.46	0.01
Aggression				
People	–0.07		0.42	0.01
Objects	–0.01		0.50	0.01

[a] Items from the withdrawal, somatic complaints, and anxious/depressed syndromes within the scale.
[b] Items from the delinquent and aggressive behavior syndromes within the scale.

abuse and sexual abuse as main effects. Mean scores on the symptom measures for the 114 subjects grouped by abuse history are presented in Table 1.

Most of the significant main effects for the Child Behavior Checklist were related to sexual abuse. Higher total scores were seen in children with histories of physical abuse ($F=4.13$, $df=1, 105$, $p<0.05$) and sexual abuse ($F=9.0$, $df=1, 105$, $p<0.01$). Children with a history of sexual abuse also had higher scores for internalizing problems ($F=10.8$, $df=1, 105$, $p<0.01$) and externalizing problems ($F=4.32$, $df=1, 105$, $p<0.05$), whereas there was no main effect for physical abuse and no interaction effect for either subscale. On the Youth Self-Report, there were only main effects for sexual abuse: children with a history of sexual abuse had higher total scores ($F=4.81$, $df=1, 106$, $p<0.05$) and externalizing problem scores ($F=4.11$, $df=1, 106$, $p<0.05$).

On the Child Acuity of Psychiatric Illness scale, there was a main effect for sexual abuse: children with a history of sexual abuse had higher total scores ($F=9.26$, $df=1, 91$, $p<0.01$), indicating more acute problems, and higher symptom ($F=5.48$, $df=1, 100$, $p<0.05$) and risk ($F=5.18$, $df=1, 104$, $p<0.05$) scores. There were no main effects for physical abuse or interaction effects for these scores.

On the Child Severity of Psychiatric Illness scale, there was a main effect for sexual abuse and an interaction effect for sexual aggression scores: higher scores were seen in children with a history of sexual abuse ($F=17.51$, $df=1, 105$, $p<0.001$) and both sexual and physical abuse ($F=4.64$, $df=1, 105$, $p<0.05$). There was no main effect for physical abuse. There was also a main effect for sexual abuse on suicide scores ($F=6.16$, $df=1, 107$, $p<0.05$) but no effect for physical abuse and no interaction effect. No associations between sexual abuse severity and any measure of psychiatric status were seen.

Finally, a multivariate ANOVA was run across all dependent variables to test the overall significance of physical and sexual abuse. There was a significant multivariate main effect for sexual abuse (Wilks's lambda=3.82, $df=13.0$, $p<0.0001$) but not for physical abuse or the sexual/physical abuse interaction.

Dissociation and Psychiatric Status

Several significant relationships were found between the measures of dissociation and mental health outcome (Table 2). There were significant inverse correlations between perceived dissociation (Child Dissociative Checklist score) and several of the competence scales from the Child Behavior Checklist, such as activities ($r=–0.30$, $df=106$, $p<0.01$), social functioning ($r=–0.38$, $df=106$, $p<0.01$), and school performance ($r=–0.29$, $df=106$, $p<0.01$). The activities score was also inversely correlated with experienced dissociation (Adolescent Dissociative Experiences Scale score) ($r=–0.25$, $df=106$, $p<0.05$).

Dissociation as a Mediator

Analyses of covariance were performed to determine whether the relationship between sexual abuse and mental health outcomes was mediated by dissociation. Sexual and physical abuse were used as factors, with experienced and perceived dissociation as covariates.

For the Child Behavior Checklist total score, perceived dissociation was significant as a covariate ($F=153.4$, $df=1, 95$, $p<0.001$). Previously significant main effects for sexual

and physical abuse were no longer significant. Perceived dissociation was a significant covariate for the internalizing ($F=66.7$, $df=1, 95$, $p<0.001$) and externalizing ($F=80.2$, $df=1, 95$, $p<0.001$) problem scores. The main effect for sexual abuse on these scores was eliminated after we controlled for dissociation.

Experienced dissociation was a significant covariate for both total score ($F=40.9$, $df=1, 93$, $p<0.001$) and the externalizing problems score ($F=18.8$, $df=1, 93$, $p<0.001$) from the Youth Self-Report. Previously significant main effects for sexual abuse on both scores disappeared after we controlled for dissociation.

For scores on the Child Acuity of Psychiatric Illness scale, perceived dissociation was a significant covariate (total: $F=86.6$, $df=1, 83$, $p<0.001$; risks: $F=49.4$, $df=1, 95$, $p<0.001$; symptoms: $F=74.6$, $df=1, 92$, $p<0.001$). The previously significant main effect for sexual abuse on all three indices disappeared.

For scores on the Child Severity of Psychiatric Illness scale, experienced dissociation was a significant covariate for suicide risk ($F=7.36$, $df=1, 94$, $p<0.01$). The previously significant main effect for sexual abuse was again not present. However, a slightly different pattern emerged for sexual aggression: while perceived dissociation was again a significant covariate ($F=5.0$, $df=1, 93$, $p<0.05$), a significant main effect remained for sexual abuse ($F=8.64$, $df=1, 93$, $p<0.01$) and the physical and sexual abuse interaction ($F=4.43$, $df=1, 93$, $p<0.05$).

Discussion

The primary finding of this study is that dissociation appears to have a mediating role between sexual abuse and a variety of mental health outcomes. Higher levels of dissociation were found among sexually abused children than among physically abused children. Dissociation was associated with more symptoms, more frequent risk-taking behaviors, and less competent functioning. Consistent with other research, sexually abused children exhibited more symptoms and acute disturbance, including suicidality, sexual aggression, and self-mutilation (6–9). Associations between severity of sexual abuse, dissociation, and outcomes were not found, likely because of the consistently severe abuse histories within this study group. Overall, these findings suggest a unique relationship between sexual abuse and dissociation (1, 9) and the potential importance of dissociation as a mediator of symptoms, particularly destructive and harmful behaviors, among sexually abused children (14). These findings are compelling and may have clinical implications for work with traumatized children.

This study has a number of strengths, including its multimethod design, mixed gender sample, and replication of findings across several measures and perspectives. There are also limitations and questions to consider. One important issue concerns the measures of dissociation: the Adolescent Dissociative Experiences Scale, referred to as "experienced dissociation," and the Child Dissociative Checklist, a "perceived dissociation" measure. While associated with each other, these variables were not highly correlated, perhaps reflecting separate constructs. The dissociation measures were primarily associated with outcomes of the same informant (e.g., child-reported dissociation to child-reported symptoms), yet some significant cross-informant relationships still existed. Thus, the findings cannot be attributed solely to method variance.

It is possible that children, particularly adolescents, are better able to describe their internal experience; adult observations of dissociation may reflect external behaviors related to dissociation. This could represent a central difficulty in measuring dissociation in children. Pathological dissociation may be clinically inferred by the degree of problematic (e.g., destructive or harmful) behavior that is present. Alternately, if a child's behavior is sufficiently disruptive and dissociation is not assessed in a particular setting, it may be overlooked. In fact, the Child Dissociative Checklist, the adult-report measure, includes an item on sexual behavior in its rating of dissociation. This could have presented a confound for this study as dissociation was hypothesized to mediate risk behaviors.

In this study, dissociation was measured on a continuum as it relates to abuse history and mental health outcome. While the dissociation scores for this group were similar to those of other samples of abused children, the average scores were not within the pathological or diagnostic range for dissociation (18, 20).

Evidence for a relationship among abuse history, dissociation, and psychopathology was quite compelling, but the data only suggest that these variables are associated at the present time. Causal effects and directional relationships cannot be inferred given the cross-sectional design of this study.

This was an extreme sample of the child psychiatric population. All of the subjects were in state protective custody and receiving long-term psychiatric services. Therefore, direct responses to abuse were not assessed, and symptoms may have shifted over time as a result of other experiences. With a significant subset of children exhibiting some history of sexual aggression, the generalizability of these findings to other populations may be limited.

Conclusions

Dissociation has been considered a mediator of psychopathology and risk-taking behavior in previous studies of childhood sexual abuse (2, 3, 12, 14) and adult sexual trauma (24). This study supports these findings and may have implications for treatment. Assessing dissociation may be an important aspect of clinical care among traumatized children. However, fully understanding these relationships requires further empirical studies with multiple and varied methods and measurement among

individuals at different developmental stages. It would be useful to assess children and their dissociative responses closer to the time of abuse and across development to understand how dissociation relates to psychiatric outcomes over time. It is also important to consider how pathological levels of dissociation relate to symptoms and risk. Longitudinal studies are critical for assessing how dissociation is adaptive in the short term and when and how it becomes maladaptive. Future research is needed in these areas to better understand these complex phenomena, forestall inappropriate diagnosis and treatment, and prevent further trauma in the lives of abused children.

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Regular Article

Attention-deficit/hyperactivity disorder and dissociative disorder among abused children

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Abstract The aim of this study was to investigate the psychiatric problems and characteristics among children of child abuse (CA). Specifically, the authors investigated whether attention-deficit/hyperactivity disorder (ADHD) symptoms were exhibited before or after CA. A total of 39 abused child inpatients who were treated at Aichi Children's Health and Medical Center, Aichi, Japan, (mean age, 10.7 ± 2.6; mean IQ scores, 84.1 ± 19.3) were included in the study. The most frequent diagnosis was dissociative disorder in 59% of abused subjects. ADHD was diagnosed in 18% of abused subjects, and 71% of ADHD children had comorbid dissociative disorder. A total of 67% of all CA subjects fulfilled the ADHD criteria A according to DSM-IV-TR, however, only 27% of those fulfilled the criteria before CA. The subjects of dissociative disorder fulfilled ADHD criteria A more frequently than those of non-dissociative disorder ($P = 0.013$), and this result led to an increase in the frequency of the apparent ADHD. The rate of ADHD-suspected parents in the subjects who fulfilled ADHD criteria A after CA was significantly lower than those who fulfilled it before CA ($P = 0.005$). While it is difficult to distinguish ADHD from dissociative disorder, abused children may have increased apparent ADHD due to dissociative disorder. Further studies should be conducted in order to explore the distinct biological differences between ADHD before CA and the subjects who fulfilled ADHD criteria A after CA.

Key words attention-deficit/hyperactivity disorder, child abuse, dissociative disorder.

INTRODUCTION

Child abuse (CA) is one of the most important problems of child psychiatry. Developmental disorders such as pervasive developmental disorder (PDD), attention-deficit/hyperactivity disorder (ADHD) and learning disorder are regarded as psychiatric risk factors of CA.[1] ADHD was reportedly observed in 14–46% of abused children,[2–4] suggesting that ADHD is more common in abused children than in the general population (3–7%[5]). However, Glod and Teicher[2] reported that children who had not met ADHD criteria before CA expressed hyperactivity due to a hypervigilant state after CA. ADHD is often diagnosed in abused children, however, abused children without ADHD before CA also exhibit hyperactivity similar to ADHD after CA.

Recent neuroimaging studies suggested that abused children exhibited increased volumes of superior temporal gyrus[6] and pituitary,[7] decreased volumes of hippocampus[8,9] and corpus callosum,[10,11] increased regional cerebral blood flow (CBF) in the orbitofrontal cortex and anterior temporal pole,[12] decreased activation in hippocampus,[8] and low N-acetylaspartate in the anterior cingulate.[13] It was reported that ADHD children have cerebellar-prefrontal-striatal dysfunction.[14] These previous reports suggest an etiological difference between hyperactivity of abused children and that associated with ADHD.

The aim of this study was to investigate the psychiatric problems and characteristics of abused children. Specifically, the authors investigated whether ADHD symptoms were exhibited before or after CA, and they also examined the relationship between ADHD symptoms and dissociative disorder.

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METHODS

Subjects

A total of 39 child inpatients treated at Aichi Children's Health and Medical Center, a foundation hospital for CA treatment in Aichi prefecture, Japan, were included in the study. These subjects were all abused patients treated at the Center from April 2004 to November 2004. Screening was performed on all patients entering treatment by a psychiatrist and a clinical psychotherapist, and children who had a history of CA, such as physical, psychological, sexual abuse, and neglect, participated in this study.

Procedure

All subjects were diagnosed according to the DSM-IV-TR[5] and tested using the Wechsler Intelligence Scale for Children–third edition (WISC-III) for intelligence assessment. Further screening was done using the Child Dissociative Checklist, Version 3.0 (CDC)[15,16] by child psychiatrists. For further analysis, the authors confirmed with all CA subjects whether they fulfilled DSM-IV-TR ADHD criteria A (ADHD-A; excluding ADHD criteria B–E) and from when they had fulfilled it. The authors defined CA subjects who fulfilled ADHD-A before CA as 'ADHD-A before CA' subjects and those who fulfilled it after CA as 'ADHD-A after CA' subjects. Furthermore, the authors confirmed whether the subjects' parents (either the father or mother) had ADHD-A symptoms in their childhood based on the information obtained from the grandparents. The authors defined parents who fulfilled ADHD-A in their childhood as 'ADHD-suspected parents'. This study was approved by the ethical committee of the Aichi Children's Medical Center.

Statistical analyses

Frequency analysis was performed with the χ^2-test and Fisher's exact test. Continuous data, such as CDC scores, was explored using the Student's *t*-test. Differences between groups for age, IQ scores, and CDC scores were tested by ANOVA. Post hoc comparisons were performed using the Tukey test to identify differences between groups. Statistical significance was set at the 5% level.

RESULTS

Psychiatric diagnosis

The subjects were 39 abused children (16 boys and 23 girls; mean age, 10.7 ± 0.6). Psychiatric diagnoses are given in Table 1. As Table 1 shows, the most frequent diagnosis was dissociative disorder (dissociative disorder not otherwise specified; NOS and dissociative identity disorder) in 59% ($n = 23/39$) of abused subjects. All dissociative disorder NOS subjects were clinical presentations similar to dissociative identity disorder that failed to meet full criteria for this disorder. PDD (Asperger's disorder and PDD not otherwise specified) and ADHD were diagnosed before CA in 23% ($n = 9/39$) and 18% ($n = 7/39$) of abused subjects, respectively. Moreover, 71% of ADHD children ($n = 5/7$) had comorbid dissociative disorder.

Attention-deficit/hyperactivity disorder symptoms

All subjects were screened to determine if they met ADHD-A. A total of 67% of all CA subjects ($n = 26/39$) fulfilled ADHD-A. However, only 27% of these subjects were determined to have ADHD-A before CA ($n = 7/26$), whereas the other 73% ($n = 19/26$) were determined to have ADHD-A after CA. Of the patients diagnosed with ADHD-A after CA, 12 were diagnosed with dissociative disorder (two with dissociative identity disorder and 10 with dissociative disorder not otherwise specified) and seven with PDD (six Asperger's disorder and one PDD-NOS).

Dissociative disorder

Child abuse subjects were most frequently diagnosed with dissociative disorders (Table 1). Some type of dissociative disorder was found in 59% of total subjects ($n = 23/39$). None of the PDD subjects ($n = 9$) showed dissociative disorder. The development of dissociative

Table 1. Psychiatric diagnoses of abused children

	n	(%)
DD-NOS	12	(30.8)
Asperger's disorder	8	(20.5)
DD-NOS + ADHD	5	(12.8)
Dissociative identity disorder	4	(10.3)
Borderline personality disorder	2	(5.1)
DD-NOS + conversion disorder	2	(5.1)
ADHD	2	(5.1)
Pervasive developmental disorder not otherwise specified	1	(2.6)
Major depressive disorder	1	(2.6)
Adjustment disorder	1	(2.6)
Obsessive–compulsive disorder	1	(2.6)

ADHD, attention-deficit/hyperactivity disorder; DD-NOS, dissociative disorder not otherwise specified.

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Table 2. Comorbidity of dissociative disorder and attention-deficit/hyperactivity disorder symptoms

ADHD-A symptoms	Subjects who did not fulfil ADHD-A before CA (–) before and (–) after CA†	(–) before and (+) after CA†	Subjects who fulfilled ADHD-A before CA (+) before and (+) after CA	Total
Dissociative disorder (+)	6	12	5	23
Dissociative disorder (–)	5	0	2	7
Total	11	12	7	30

† $\chi^2 = 6.97$, d.f. = 1, $P = 0.013$.
CA, child abuse; ADHD-A, attention-deficit/hyperactivity disorder criteria A according to the DSM-IV-TR.

disorder in PDD subjects may be different from other individuals, therefore, PDD subjects were excluded from the following analysis of dissociative disorder.

As Table 2 shows, dissociative disorder was equally comorbid among both the subjects who fulfilled ADHD-A before CA ($n = 5/7, 71\%$) and those who did not fulfil ADHD-A before CA ($n = 18/23, 78\%$). However, 12 of the dissociative disorder subjects who did not fulfil ADHD-A before CA were determined to have ADHD-A after CA when they were screened after CA (Table 2). Among the subjects who did not fulfil ADHD-A before CA, the subjects with dissociative disorder fulfilled ADHD-A after CA more frequently ($n = 12/18$) than those without dissociative disorder ($n = 0/5$). Although only seven of 30 subjects fulfilled ADHD-A when they were screened before CA, an additional 12 subjects fulfilled ADHD-A after CA. This result lead to a significant increase of apparent ADHD compared to before CA ($n = 7/30$ vs $12 + 7/30$, $\chi^2 = 9.77$, d.f. = 1, $P = 0.004$).

In a comparison of CDC scores, there was a significant group effects for CDC scores among six groups as seen in Table 2 ($F = 2.86$, $P = 0.045$). Understandably, CDC scores of the subjects with dissociative disorder were significantly higher than those without dissociative disorder (20.4 ± 7.3 vs 11.3 ± 4.4, $t = -4.05$, d.f. = 17.1, $P = 0.001$). In post hoc analysis, no significant differences were detected for CDC scores between the six groups. There was no significant group effects for age and IQ scores ($F = 2.33$, $P = 0.117$, and $F = 1.77$, $P = 0.194$, respectively).

Comparison between attention-deficit/hyperactivity disorder before child abuse and attention-deficit/hyperactivity disorder after child abuse subjects

The data of parents were obtained from 34 subjects. The rate of ADHD-suspected parents was compared between ADHD-A before CA, ADHD-A after CA, and subjects who did not have ADHD-A symptoms both before and after CA, and there was a significant difference between these three groups ($\chi^2 = 13.05$, d.f. = 2, $P = 0.001$). The rate of ADHD-suspected parents in ADHD-A before CA subjects was significantly higher than that in ADHD-A after CA subjects and in the subjects who did not have ADHD-A both before and after CA (100% vs 31.3% and 18.2%; $\chi^2 = 9.22$, d.f. = 1, $P = 0.005$, and $\chi^2 = 11.45$, d.f. = 1, $P = 0.002$, respectively; Fig. 1). There was no significant group effects for age, IQ scores, and CDC scores between ADHD-A before CA, ADHD-A after CA subjects, and the subjects who did not fulfil ADHD-A both before and after CA ($F = 1.70$, $P = 0.198$ for age; $F = 2.28$, $P = 0.12$ for IQ scores; $F = 0.68$, $P = 0.52$ for CDC scores; respectively).

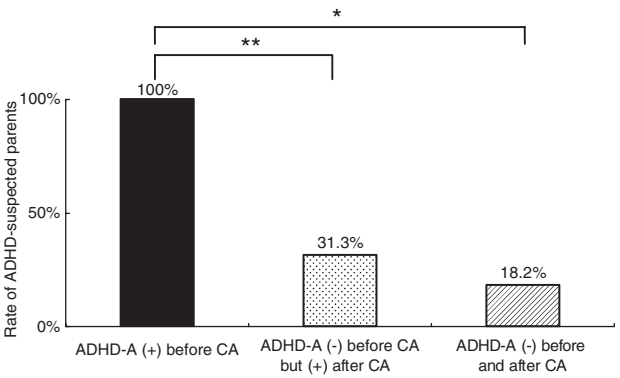

Figure 1. Rate of attention-deficit/hyperactivity disorder (ADHD)-suspected parents of abused children. ADHD-A (+) before child abuse (CA; $n = 7$): Subjects who have fulfilled the ADHD criteria A according to the DSM-IV-TR before child abuse. ADHD-A (–) before CA but (+) after CA ($n = 16$): subjects who did not fulfil DSM-IV-TR ADHD criteria A before child abuse but fulfilled it after child abuse. ADHD-A (–) before and after CA ($n = 11$): subjects who did not fulfil DSM-IV-TR ADHD criteria A both before and after child abuse. *$P = 0.002$; **$P = 0.005$.

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DISCUSSION

The abused children in this study had a high prevalence of ADHD (18%), which is similar to previous studies,[2–4] and many of the abused children examined exhibited ADHD criteria A symptoms after CA. The question remains of why abused children fulfil the ADHD criteria A after CA.

Previous neurophysiological studies have suggested that traumatized children have an abnormal concentration of attention and discrimination of relevant stimuli,[17] such as abnormal habituation[18,19] or abnormal event-related potential (ERP).[20,21] Consequently, abused children have posteriori abnormal concentration of attention and impulse control. These symptoms might also be valid for ADHD-A in a cross-sectional study. Furthermore, in this study, the subjects of dissociative disorder fulfilled ADHD-A more frequently than those of non-dissociative disorder, and this result lead to an increase in the frequency of the apparent ADHD. These dissociative symptoms may be partially congruent with inattention symptoms of ADHD-A if DSM criteria are applied in a cross-sectional manner. Consequently, a large number of abused children would be diagnosed with ADHD after CA.

The results of this study also suggest the inheritance differences between ADHD-A before CA and ADHD-A after CA. As mentioned above, previous neuroimaging studies have suggested an etiological difference between ADHD children and abused children. Further genetic or biological studies might enable one to more readily distinguish between ADHD before and after CA. Additionally, the result of inheritance also indicated some other possibilities. One possibility is that ADHD-suspected parents were more likely to abuse their children, and the other is that ADHD-suspected parents have been abused by their parents and they have become ADHD-A after CA. However, it was uncertain whether the parents of subjects have been abused in their childhoods based on the information obtained from the grandparents.

This study has some limitations. For example, no control subjects, nonabused children, were included. This study examined psychiatric inpatients, and it was difficult to include children who had no psychiatric problems. Furthermore, the sample size of this study was not very large. Further research with a larger sample size should be conducted. In this study, the authors used CDC for assessment of dissociation. Although CDC was translated into Japanese,[16] reliability and validity of it was not confirmed among the Japanese population. It might not be appropriate to use CDC for assessment of dissociation among Japanese abused children. The reliability and validity of a child dissociation scale should be established in Japan as soon as possible.

This study suggests that there are a large number of abused children with ADHD and that abused children frequently present ADHD-A symptoms after CA. Additionally, the present results also suggest that the rate of ADHD-suspected parents between ADHD-A before CA and ADHD-A after CA subjects is different. After CA, the subjects who had dissociative disorder fulfilled ADHD-A more frequently than those who did not, and dissociative disorder was frequently comorbid with both ADHD-A before CA and ADHD-A after CA. While it is difficult to distinguish ADHD from dissociative disorder, abused children may have increased apparent ADHD due to dissociative disorder. Clinicians need to treat abused children taking both ADHD and dissociative disorder into consideration, and it might be necessary to revise the diagnostic criteria in the future. Further studies should explore distinct biological differences between ADHD before CA and ADHD after CA and how to treat ADHD comorbid dissociative disorder.

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Brief communication

Trauma-related predictors of deontic reasoning: A pilot study in a community sample of children☆

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ABSTRACT

Objective: Deontic reasoning (i.e., reasoning about duties and obligations) is essential to navigating interpersonal relationships. Though previous research demonstrates links between deontic reasoning abilities and trauma-related factors (i.e., dissociation, exposure to multiple victimizations) in adults, studies have yet to examine deontic reasoning abilities in children exposed to trauma. Given that social and safety rules (exemplars of deontic reasoning rules) may appear arbitrary for children in the face of trauma exposure, particularly interpersonal violence perpetrated by adults (i.e., caregivers, close relatives), we predicted that the ability to detect violations of these rules would vary as a function of trauma exposure type (no, non-interpersonal, and interpersonal). Additionally, given previous research linking dissociation and deontic reasoning in adults, we predicted that higher levels of dissociation would be associated with more errors in deontic problems.
Methods: Children exposed to interpersonal violence (e.g., sexual abuse by an adult family member, witnessing domestic violence, or physical abuse in the home) were compared to children exposed to non-interpersonal trauma (e.g., motor vehicle accident, natural disaster) or no trauma on their ability to detect violations of deontic and descriptive rules in a Wason Selection Task and assessed for their level of dissociative symptoms.
Results: Dissociation (but not trauma exposure type) predicted errors in deontic (but not descriptive) reasoning problems after controlling for estimated IQ, socio-economic status, and children's ages.
Conclusions: The current study provides preliminary evidence that deontic reasoning is associated with dissociation in children. This pilot study points to the need for future research on trauma-related predictors of deontic reasoning.
Practice implications: Deontic rules are essential to navigating interpersonal relationships; errors detecting violations of deontic rules have been associated with multiple victimizations in adulthood. Future research on violence exposure, dissociation, and deontic reasoning in children may have important implications for intervention and prevention around interpersonal functioning and later interpersonal risk.
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Introduction

Deontic reasoning involves reasoning about "what one may, ought, or may not do in a given set of circumstances" (Cummins, 1996a, p. 161), whereas descriptive reasoning involves reasoning about descriptions of some aspect of the world (Ermer, Guerin, Cosmides, Tooby, & Miller, 2006). For example, a deontic rule states, "If it is cold outside, then you must wear

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a coat." A descriptive rule, on the other hand, states "If you play soccer, then you take the red water bottle." Typically developing children and adults are more likely to detect violations of deontic rules compared to descriptive rules (e.g., Cosmides, 1989; Cosmides & Tooby, 1992, 1997; Ermer et al., 2006; Klaczynski, 1993; Light, Blaye, Gilly, & Girotto, 1989), even as young as 3–4 years of age (Cummins, 1996b; Núnez & Harris, 1998).

Deontic reasoning is critical to navigating social relationships and institutions (Cummins, 1996b). Impoverished deontic reasoning abilities are likely to place individuals at high risk for being taken advantage of in relationships or failing to protect against harm (Stone, Cosmides, Tooby, Kroll, & Knight, 2002). Thus, deontic reasoning performance may be particularly relevant to the deleterious interpersonal consequences associated with child victimization, such as peer victimization in childhood (e.g., Shields & Cicchetti, 2001; Schwartz, Dodge, Pettit, & Bates, 1997; Schwartz, Dodge, Pettit, & Bates, 2000) and physical and/or sexual revictimization in adolescence and young adulthood (for review, see Arata, 2002).

To date, we are aware of only one study that has examined deontic reasoning and trauma-related factors. DePrince (2005) reported that young adults who reported histories of victimizations both before and after age 18 made significantly more errors detecting violations of deontic rules (both social contract – rules involving a social exchange; and precautionary – rules involving safety) than their peers; the groups did not differ in descriptive reasoning. Importantly, pathological dissociation explained unique variance in deontic reasoning performance after controlling for other trauma-related factors (DePrince, 2005). Dissociation is associated with a host of information processing difficulties (e.g., memory problems; see Putnam, 1997), including disruptions in working memory and processing speed (DePrince & Weinzierl, 2006). Working memory and processing speed have, in turn, been implicated in deontic reasoning (Klaczynski, Schuneman, & Daniel, 2004). In the current study, we evaluated whether dissociation was linked with deontic (and not descriptive) reasoning errors in school-aged children. Specifically, we predicted that higher levels of dissociation would be associated with more errors in deontic (but not descriptive) reasoning problems.

In addition to dissociation, we also examined trauma exposure history in relation to deontic reasoning. While DePrince (2005) argued that poorer deontic reasoning may increase risk of multiple victimizations in young adulthood, certain types of trauma exposure in childhood may be associated with deficits in deontic reasoning. To the extent that traumatic events generally challenge fundamental assumptions regarding predictability, safety, and trust (e.g., Janoff-Bulman, 1992), deontic rules may seem arbitrary and unreliable to children who grow up in environments that include exposure to potentially traumatizing events. Therefore, trauma-exposed children may generally show problems detecting violations of safety and social relationship rules. Thus, we predicted that any trauma exposure (non-interpersonal or interpersonal) would be associated with worse deontic performance than no exposure.

To further qualify this prediction, we also hypothesized that interpersonal trauma exposure would be associated with worse deontic performance than non-interpersonal trauma exposure. In the face of interpersonal violence, deontic rules about safety and social exchange may seem particularly arbitrary and, therefore, be associated with worse performance. Indeed, Freyd (1996) has argued that the close nature of victim–perpetrator relationships (e.g., in familial violence) may decrease children's motivation to develop accurate reasoning about social relationships because the abusive caregiving relationship violates a fundamental social contract. In addition, violent family environments, in particular, may fail to provide the structure or social learning environment required to develop these reasoning abilities. Thus, we predicted that interpersonal trauma exposure would be associated with poorer deontic (but not descriptive) than non-interpersonal trauma exposure, which would be associated with worse performance than no trauma exposure.

Current study

The current study provides the first examination of trauma-related predictors of children's deontic reasoning performance. Drawing on theory (e.g., Janoff-Bulman, 1992; Freyd, 1996) and previous research (DePrince, 2005), we tested the contributions of trauma exposure type and dissociation to deontic reasoning performance in school-aged children. A priori contrast weights for trauma exposure groups that corresponded to the predicted pattern of means were assigned (weights: interpersonal trauma = 1, non-interpersonal trauma = 0, no trauma = −1). The use of planned contrast weights is justified given a priori predictions (Loftus, 1996; Furr, 2004) and minimizes Type II errors that would be associated with post hoc comparisons between multiple groups in a small pilot sample.

Method

Participants

Prior to data collection, all procedures were approved by the University of Denver Institutional Review Board. Participants were recruited in the Denver, Colorado, metro area through flyers in social service and mental health agencies, community centers, and local businesses as part of a larger study on parenting and stress that involved additional lab tasks not reported here. Female guardians and their school-aged children were paid for their participation; children received several small prizes throughout the testing session. All participants completed an extensive informed consent process. Of the 72 children who participated in the larger study, we report here on the 63 children for whom we had complete reasoning data. Of these 63 children (Age $M = 8.89$; S.D. = 1.36), 43 were female. Five female guardians did

Table 1
Descriptive statistics for variables used in hierarchical regression analyses

	No trauma[a] ($n = 22$)		Non-interpersonal trauma[b] ($n = 14$)		Interpersonal trauma[c] ($n = 27$)		Differences between groups
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
Predictors							
IQ estimate	106.09	17.78	99.36	14.27	92.67	12.83	a, c
Child age	8.82	1.22	8.79	1.37	9.07	1.47	
SES composite	0.07	0.89	0.16	0.71	−0.15	0.79	
Dissociation	0.18	0.17	0.21	0.14	0.4	0.38	a, c
Outcomes							
Descriptive errors (range 0–12)	5.14	1.78	6.21	1.97	5.63	1.82	
Deontic errors (range 0–24)	4.55	3.88	6.14	3.88	6.33	5.06	

Note: Letters indicate differences between groups revealed by Tukey's Honest Significant Difference (HSD) test ($p < .05$).

not provide racial/ethnic information about their children; the remaining children were reported to be of the following racial and ethnic backgrounds: 40% Euro-American, 19% African-American, 19% Hispanic/Latino, 3% Native Hawaiian/Pacific Islander, and 11% other race or bi/multiracial. Mothers reported the following income levels: 33.3% below $10,000; 14.3% $10,000–20,000; 14.3% $20,001–30,000; 7.9% $30,001–40,000; 7.9% $40,001–50,000; and 22.2% above $50,000. An SES composite score was created by transforming the following variables to *z*-scores and calculating the average: income (ranging from 1 = $10,000 or below to 6 = $50,000 or above), maternal occupational status (Hollingshead, 1975), and maternal years of education (see Table 1). The SES composite did not differ across the trauma exposure groups ($F(2, 60) = .82$, $p = .44$).

Materials

Replicating methods from previous studies of deontic reasoning (e.g., Cosmides & Tooby, 1992, 1997; Stone et al., 2002; Núnez & Harris, 1998), participants were presented with a series of conditional (if p, then q) rules using the Wason Selection Task (WST). Consistent with WST methods previously used with children (Núnez & Harris, 1998), response sets developed for this study included four cards with pictorial representations of p, not-p, q, and not-q options. Children were instructed to pick which cards must be turned over to check if anyone was breaking the 'if p-then q' rule (see Section "Procedure" for additional task administration details). For each rule, a child could make up to four errors (two commission and two omission). Deontic rules included three social contract and three precautionary rules. As detailed by Ermer et al. (2006), social contract rules took the form "If you [take the benefit P], then you must [satisfy the requirement Q]". For example, "If you go outside to play, then you must have a clean room." Precautionary rules took the form "If you [engage in the hazardous activity P], then you must [take the precaution Q]". For example, "If it is cold outside, then you must wear a coat." Descriptive rules took the form "If you are [in category P], then you [have the preference, habit or trait Q]". For example, "If you are reading a book, then you sit in a green chair." Total errors for the six deontic (possible range: 0–24) and three descriptive (possible range: 0–12) rules were tallied.

In order to help rule out the possibility that any differences in WST performance were due to overall intelligence, children also completed the Block Design and Vocabulary scales of the Wechsler Intelligence Scales for Children (WISC; either 3rd or 4th edition; Wechsler, 1991a, 2003a). Full Scale IQ was estimated from scaled scores (Wechsler, 1991b, 2003b) and used as a covariate in regression models.

Guardians reported on children's trauma history using behaviourally defined questions from the UCLA PTSD Index (Pynoos, Rodriguez, Steinberg, Stuber, & Frederick, 1998). The measure has been shown to have good test–retest reliability and internal consistency (e.g., Roussos et al., 2005) as well as validity (e.g., correspondence with well-established PTSD interviews; Rodriguez, Steinberg, Saltzman, & Pynoos, 2001). While this measure also assesses PTSD symptoms, we only used the reports of the child's trauma exposure here. Dissociation was assessed using the Child Dissociative Checklist (CDC; Putnam, 1997), a 20-item guardian-report measure that assesses multiple types of observable, dissociative behaviors. The CDC has been shown to have good test–retest reliability and internal consistency, as well as discriminant validity in distinguishing children with and without pathological levels of dissociation (for review see Putnam, 1997). Internal consistency was excellent in this sample (Cronbach's alpha = 0.89).

Procedure

After the consent process, mothers were seated in a private room and asked to complete questionnaires. Children were tested by a graduate research assistant in a separate, private room. WISC scales were administered first, followed by the WST. WST rules were read out loud to children, who were asked to make responses using pictures; this procedure has been used successfully by other researchers with young children (e.g., Núnez & Harris, 1998). Children were asked to play a detective game in which they had to decide when rules might be broken. The experimenter told chil-

dren that they would hear a rule and see four cards with information on only one side. Using these cards, children were asked to decide when the rule might be broken and an investigation should be started. Children were instructed to pick (by pointing at pictures) only those cards to investigate that were the most important. Children did not receive accuracy feedback, as such feedback could have guided performance on the test rules (e.g., children would know that there were always two correct responses). After three sample rules to familiarize children with the task, test rules were presented in random order for each participant. Upon completion of the study tasks, child and adult participants were debriefed.

Results

Table 1 provides descriptive statistics for study variables by trauma-exposure group, as well as differences between the groups. Notably, neither predictor nor outcome variables differed as a function of gender; therefore gender is not included in the reported analyses.

WST psychometrics

Cronbach's alphas were calculated for errors on the six deontic rules; internal consistency was excellent (alpha = .82). Task validity was assessed by comparing deontic and descriptive performance. Convergent with previous findings using the WST, children made significantly more errors (as a proportion of errors possible) on descriptive than deontic rules [$t(62) = 9.41$, $p < .001$]; the effect size was large (Cohen's $d = 1.35$).

Predictors of WST performance

Using hierarchical multiple regression analyses, we tested models predicting both descriptive and deontic errors. Correlations among predictor variables for the hierarchical regressions are reported in Table 2. Child age, IQ estimate, and SES composite were entered on the first step; trauma exposure status and dissociation scores were entered on the second step. The model predicting descriptive errors failed to reach significance at either the first ($F(3, 59) = 2.13$, $p = .11$) or second ($F(5, 57) = 1.63$, $p = .17$) step.

The model predicting deontic errors was significant at Step 1 ($F(3, 59) = 2.97$, $p < .05$; $R^2 = .13$). The change in R^2 was significant (*F-change*$(2, 57) = 3.95$, $p < .05$) at Step 2, with the full model reaching significance ($F(5, 57) = 3.54$, $p < .01$; $R^2 = .24$). As seen in Table 3, only dissociation scores explained unique variance in deontic errors, though estimated IQ approached conventional significance levels.

Discussion

This pilot study is the first to examine trauma-related predictors of deontic reasoning in children. Dissociation explained unique variance in deontic errors (beta = .35), even after controlling for estimated IQ, socio-economic status, and child age. This finding contributes to the larger literature on dissociation and disruptions in information processing, replicating a recent finding with young adults. Specifically, DePrince (2005) reported that dissociation predicted unique variance in deontic (e.g., beta = .30), but not descriptive reasoning errors. Thus, in both children and young adults, dissociation is associated with a specific type of reasoning error, but not global reasoning deficits (as illustrated by the lack of relationship to descriptive reasoning errors). As working memory and processing speed are implicated in both dissociation (e.g., DePrince & Weinzierl, 2006) and deontic reasoning (e.g., Klaczynski et al., 2004), future research should evaluate whether links between dissociation and deontic reasoning are mediated by deficits in working memory and/or processing speed.

Because of the importance of deontic reasoning to social relationships, the dissociation–deontic reasoning findings reported here may have implications for understanding some of the interpersonal correlates of dissociation, including revictimization. Several researchers have reported associations between dissociation and revictimization (see Classen, Palesh, & Aggarwal, 2005); however, the mechanisms by which dissociation might mediate later victimization have been unclear. In the current study, dissociation is associated with more errors in deontic reasoning fairly early in child development. By

Table 2
Zero-order correlations among predictor variables used in hierarchical regression analyses

	Dissociation	SES composite	Child age	Trauma exposure group
IQ estimate	−0.10	0.40**	0.01	−0.37**
Dissociation		0.09	0.23	0.34**
SES composite			−0.09	−0.13
Child age				0.09

Note: The trauma exposure group variable was coded using a priori contrast weights: no trauma (−1), non-interpersonal trauma (0), interpersonal trauma (1).

** $p < .01$.

Table 3
Regression coefficients for hierarchical regression model predicting deontic errors

	Beta	S.E. (B)	*t*
Step 1			
Estimated IQ	−0.28	0.04	−2.09*
SES composite	−0.14	0.73	−1.07
Child age	−0.06	0.40	−0.50
Step 2			
Estimated IQ	−0.24	0.04	−1.74†
SES composite	−0.20	0.71	−1.57
Child age	−0.14	0.40	−1.19
Trauma exposure group	−0.05	0.66	−0.35
Dissociation	0.35	1.95	2.75**

† $p < .10$.
* $p < .05$.
** $p < .01$.

young adulthood, participants reporting experiences of revictimization both make more errors in deontic reasoning problems; and report higher levels of dissociation (DePrince, 2005). Therefore, future longitudinal research should test whether disruptions in deontic reasoning early in development might mediate links between dissociation and later victimization risk.

In contrast to our prediction, trauma-exposure was not associated with deontic reasoning errors. It may indeed be the case that these variables are simply unrelated; however, several methodological issues should be taken into account in future research. First, given that we used a screener (rather than interview) for trauma exposure, we had relatively limited information about the details of the trauma exposure. Nineteen of the 27 children in the interpersonal trauma group were reported to have been exposed to violence in the family environment (e.g., sexual abuse by an adult family member, witnessing domestic violence, or physical abuse in the home); the remaining 8 were exposed to interpersonal violence in their communities or sexual abuse by an adult whose relationship to the child was not specified. Among those exposed to violence in the family, the degree of closeness with the perpetrator may have varied greatly. It may be that trauma exposure is associated with deontic reasoning disruptions in cases of close-other abuse; and not in more general cases of interpersonal violence (e.g., see Freyd, 1996). We were unable to examine this closely in the current data.

Second, we relied on parent-report of trauma exposure. Parents may have failed to report fully on interpersonal violence exposure because of social desirability, fears of consequences of reporting, or lack of knowledge about such events. Thus, some children may have been mis-categorized in terms of the trauma exposure group. As noted by one anonymous reviewer of this manuscript, in the case of under-reporting of familial violence, dissociation may actually be a better indicator of level of trauma than the form of trauma reported by parents. Thus, extending this research to samples with confirmed abuse or where children also report on trauma-exposure will be important.

Interpretation of these findings must be cautious for many reasons. Small sample size, low power, and potential self-selection biases inherent in community-based recruiting create challenges in generalizing these findings to other groups, therefore requiring replication in other samples. Further, participants in this sample reported low income levels, suggesting further research is needed to evaluate how findings generalize to other socio-economic groups. As noted previously, the current study depended on guardian-reported trauma history and child symptoms. Given various pressures (e.g., social desirability), some guardians may have failed to accurately report on their children's trauma histories or symptoms, thus adding error variance. Finally, the questionnaire used to assess trauma exposure did not allow us to examine contextual factors, such as age of onset or frequency of exposure to potentially traumatic events that may be important contributors to deontic reasoning abilities.

In summary, these findings contribute to the growing literature on information processing alterations associated with maltreatment (e.g., Pollak, Cicchetti, Hornung, & Reed, 2000) and dissociation (e.g., Cromer, Stevens, DePrince, & Pears, 2006; DePrince & Weinzierl, 2006).

Given the importance of deontic reasoning to navigating the social world and the serious interpersonal consequences associated with child maltreatment, future research of reasoning abilities in relation to trauma exposure and trauma-related symptoms is warranted.

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Stroop Performance, Dissociation, and Trauma Exposure in a Community Sample of Children

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ABSTRACT. Extending previous research with adults, the current study examined Stroop task performance under selective and divided attention demands in a community sample of school-age children ($N = 97$). Stroop interference scores in both attention conditions were calculated. Higher levels of child-reported dissociation were associated with better interference control under divided attention conditions and worse control under selective attention conditions; lower levels of dissociation were associated with the opposite pattern. Both family violence exposure and Stroop interaction scores explained unique variance in dissociation scores. Although research with adults has generally assumed or implied that cognitive correlates of dissociation are a consequence of dissociation, the current findings with school-age children suggest that future research should evaluate

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executive function performance (in this case, interference control) as a possible risk factor for dissociation.

KEYWORDS. Dissociation, attention, Stroop, violence, child abuse

Dissociation has been defined as a lack of integration among "psychobiological systems that constitute personality" (van der Hart, Nijenhuis, Steele, & Brown, 2004, p. 906), characterized "by profound developmental differences in the integration of behavior and in the acquisition of developmental competencies and metacognitive functions" (Putnam, 1997, p. 15). Although high levels of dissociation are associated with a host of information-processing difficulties (e.g., Freyd, Martorello, Alvarado, Hayes, & Christman, 1998; Putnam, 1997), recent work points to conditions under which highly dissociative adults actually outperform their less dissociative counterparts on laboratory tasks, depending on the cognitive demands of the task (DePrince & Freyd, 1999; Elzinga, de Beurs, Sergeant, van Dyck, & Phaf, 2000; Simeon et al., 2006).

DePrince and Freyd (1999) reported a Dissociation × Attention interaction such that undergraduate participants who scored high on a dissociation measure showed less Stroop interference when *dividing* their attention compared to *focusing* their attention; participants who scored low on dissociation showed the opposite pattern. Recently, this finding was replicated in dissociative patients relative to both depressed and healthy controls (Simeon et al., 2006), demonstrating that, even in a patient population, dissociative participants can show relative advantages under some conditions. Extending beyond interference to working memory tasks, Elzinga et al. (2007) reported that patients with dissociative disorders showed less of a decline in performance at higher levels of the n-back task (which requires keeping track of multiple pieces of information at one time) than a healthy control group.

Several ideas have been advanced to explain these findings. DePrince and Freyd (1999) proposed a cognitive environments conceptualization of dissociation that suggests that dissociation may be experienced, in part, as a state of chronically fragmented attention. From this view, dissociative experiences would, over time, lead highly dissociative individuals to become more practiced at performing under divided attention demands. In a different, though related, approach, Elzinga and colleagues (e.g., Elzinga et al., 2007) have argued that dissociation is associated with a

particular cognitive processing style that differs from the style characteristic of other related diagnostic conditions, such as posttraumatic stress disorder (PTSD). In particular, these authors argued that dissociative individuals are likely to show greater ability to inhibit trauma-related information, possibly at the expense of other cognitive processing (e.g., processing of identity-related information).

Both of these explanations (DePrince & Freyd, 1999; Elzinga et al., 2007) suggest that the dissociative capacities seen in the lab are in some way a response to coping with either trauma-related information (e.g., memories) or the very experience of dissociation (e.g., disintegrated information processing) across development into adulthood. As such, these explanations make considerable developmental inferences that should be tested in children to guide future investigations concerned with the development and nature of dissociation. For example, to the extent that a unique dissociative cognitive style develops over time into adulthood, one would expect dissociative adults, but not necessarily children, to show the Attention × Dissociation interaction. Replication of the Attention × Dissociation interaction in children would suggest that cognitive differences are present earlier in the development of dissociation than previously noted. The earlier that cognitive correlates are observed, the more pressing it will be to evaluate whether cognitive styles are a consequence of managing dissociation itself or trauma-related memories across development into adulthood or a risk factor for the development of dissociation.

If differential performance as a function of attentional demands is the consequence of pathological and/or chronic dissociation, one would expect to see interactions of task demands only with extreme groups (e.g., non- vs. pathological-dissociators). In the adult literature, researchers have generally divided participants into extreme groups, such as high versus low dissociation (e.g., DePrince & Freyd, 1999, 2001, 2004) or patient versus control (e.g., Elzinga et al., 2007; Simeon et al., 2006). If, however, differential performance as a function of attention demands is actually part of a risk factor for (rather than consequence of) pathological dissociation, one might expect continuous measures of dissociation to be associated with performance earlier in development.

In spite of the developmental inferences implied in the adult literature, few studies have examined dissociation and attention in children. A recent pilot study with 5- to 8-year-old children in foster care demonstrated that higher levels of childhood dissociation (per foster parent report) were strongly associated with deficits in tasks requiring inhibition

where cognitive load was low; however, dissociation was not associated with deficits in tasks that made greater cognitive demands on the child, such as those that required planning, strategy, and multiple rule sets (Cromer, Stevens, DePrince, & Pears, 2006). This study was limited in that the attentional demands of a single task were not manipulated (such as the Stroop manipulation in DePrince & Freyd, 1999; Simeon et al., 2006) and data were not available on trauma exposure. Given that a considerable literature links family violence exposure to higher levels of dissociation (for reviews, see Freyd, DePrince, & Gleaves, 2007; Putnam, 1997), trauma exposure status should be considered.

The current study extends research on interference control as a function of dissociation and attentional demands in adults to a community sample of school-age children. Extending DePrince and Freyd (1999) and Simeon et al. (2006), we predicted an interaction of Attention × Dissociation for Stroop interference scores in children, where Stroop interference is defined as the reaction time required to indicate the color of a word in incongruent trials (e.g., the word *red* appears in green) after subtracting the reaction time required to indicate the color of a word in neutral trials (e.g., the word *cloud* appears in green). Specifically, we hypothesized that higher dissociation scores would be associated with greater interference in selective attention conditions and less interference in divided attention conditions where the cognitive load is greater, relative to low dissociation scores, which would be associated with the opposite pattern.

METHOD

Participants

A total of 114 children aged 9 to 12 and their guardians were recruited for a two-session study through flyers advertising the "Children's Attention Research" project. Flyers stated the following: "We are studying how stressful events affect children's attention, memory, and school performance." Flyers were distributed in social service and mental health agencies, community centers, and local businesses in a large western city in the United States.

We excluded 17 children because either estimated full-scale IQ scores were less than 70 (n = 6), or we were missing either Stroop (n = 7) or trauma exposure (n = 4) data. This left a final sample of 97 children. Of

the 97 children reported on here, 51% were female; the average age was 10.39 (SD = 1.18). Parents described 4.1% of children as Asian, 29.8% as Black or African American, 33.0% as Hispanic, 6.2% as Native American, 46.4% as White or Caucasian, and 3.1% as members of another racial or ethnic group (percentages total more than 100% because guardians could check as many categories as applied). Parent–child dyads received $25 per session for their participation. In addition, children received small age-appropriate prizes during the testing session.

Materials

The Stroop task consisted of two separate blocks: selective attention and divided attention. The procedures associated with these blocks are described in further detail below. Five trial types were included in the Stroop task: rows of *x*'s, neutral, negative, positive, and incongruent. In all, 20 incongruent trials (10 per block) included the word *red* appearing in green or the word *green* appearing in red. Neutral trials (5 per block) included the following words: *coffee*, *hat*, *curtain*, *farmer*, and *button* (selective attention block); *garden*, *drum*, *moon*, *school*, and *bell* (divided attention block). Negative trials (5 per block) included *unhappy*, *sorrow*, *tears*, *upset*, and *mad* (selective attention block); *awful*, *nasty*, *hate*, *sadness*, and *anger* (divided attention block). Positive trials (5 per block) included *cheerful*, *fun*, *friendly*, *love*, and *playful* (selective attention block); *happy*, *lucky*, *enjoy*, *smile*, and *joy* (divided attention block). Neutral, negative, and positive words were randomly assigned to the two blocks. Positive, negative, and neutral words across both blocks (selective and divided) were matched for approximate average length, part of speech, and frequency.

For the purposes of testing the predicted interaction, we were interested in reaction time to neutral and incongruent trials. The number of positive, negative, and neutral words correctly recalled was used in a check of the attention manipulation. We also used comparisons between the neutral and positive/negative words as a check of the valence of the neutral words. Specifically, five research assistants who were not involved in this study were asked to rate all stimuli on a scale of 1 (*negative*) to 5 (*positive*), where 3 was neutral. We calculated the average rating across the five respondents for each word. Average ratings per word were then compared across the three categories: negative (M = 1.40; SD = 0.18), neutral (M = 3.08; SD = 0.34), and positive (M = 4.55; SD = 1.33). The one-way analysis of variance was significant, $F(2, 27) = 360.44$, $p < .001$, and

follow-up Tukey honestly significant difference tests indicated that ratings for each category differed from the others. Finally, a one-sample t test examining whether the average ratings of the 10 neutral words differed from 3 (the neutral point on the scale) was not significant, $t(9) = 0.76$, $p = .46$.

Guardians reported on children's trauma history using behaviorally defined questions from the UCLA (University of California at Los Angeles) PTSD Index (Pynoos, Rodriguez, Steinberg, Stuber, & Frederick, 1998). The measure has been shown to have good reliability (Roussos et al., 2005) and validity (Rodriguez, Steinberg, Saltzman, & Pynoos, 2001). Children were categorized in the familial trauma group if the guardian reported exposure to either physical maltreatment at home, sexual maltreatment by an adult, and/or the witnessing of domestic violence. Children were categorized in the nonfamilial trauma group if guardians reported no exposure to the previous three items and exposure to disasters, motor vehicle accidents, serious medical treatment, and/or community violence.

Dissociation was assessed using both parent and child report. The Child Dissociative Checklist (Putnam, 1997), a 20-item parent-report measure, assesses multiple types of observable, dissociative behaviors. The Child Dissociative Checklist has been demonstrated to have high reliability and validity (Putnam, 1997), with good internal consistency in the current sample (Cronbach's $\alpha = .82$). The Adolescent Dissociative Experiences Scale (Armstrong, Putnam, & Carlson, 1997) is a 30-item self-report measure that was developed for use with adolescents. Given the age of children in our sample, items were administered verbally and children responded by pointing to a Likert scale. Internal consistency of the child report of dissociation was excellent (Cronbach's $\alpha = .94$).

Procedure

Parents and children came to the laboratory for two 2-hr testing sessions as part of a larger study on children's attention and trauma exposure. All participants completed an extensive informed consent process; testing took place only after the mother consented and the child assented, both in writing.

Parents answered questionnaires in paper-and-pencil format in a quiet room with a research assistant present. Children were tested in a separate room by a graduate research assistant; they were encouraged to take breaks as needed. The Stroop task was administered via computer.

Children were asked to make a key press with their left index finger if words appeared in green and with their right index finger if words appeared in red. They were instructed to ignore the word meaning and focus only on the color of the words. All children completed a practice block of 10 trials with names as the stimuli (e.g., *ron*, *sally*, *kate*, *bob*, *danny*). They then completed the selective attention test block (consisting of the five trial types described above). Words appeared for 1,700 ms with a 2,000-ms intertrial interval. A filler list of children's names appeared at the beginning and end of the block. Children were then asked to write down all of the words they remembered from the list they just saw. Following this free-recall task, children were given new instructions for the divided attention test block. They were instructed to continue making key presses to indicate the color of words while also studying the words for a memory test at the end. They were reminded to do two things at once: Press the key to indicate the color and study the words. They saw a filler list of children's names and then test trials began, presented at the same rate as in the selective attention block. A filler list of children's names appeared at the end of the divided attention block. Children were then asked to complete another free-recall task. Following the free-recall task, they were directed to complete a recognition memory task. The 30 words from the selective and divided attention blocks as well as 30 similar distractor words were presented in random order. Children were directed to press one button to indicate if they had seen the word before (an "old" word) and another button if the word was new (a "new" word). At the end of the study, children completed a debriefing process that involved reporting on their responses to research participation.

RESULTS

Survey Measures

According to guardian report, 40 children were exposed to physical maltreatment at home, sexual maltreatment by an adult, and/or the witnessing of domestic violence (family trauma group); 32 children were exposed to nonmaltreatment traumas only, such as natural disasters, motor vehicle accidents, serious medical treatment, and/or community violence (nonfamilial trauma group); and 25 children were not exposed to trauma (no trauma group).[1] A planned contrast revealed that family violence was associated with higher levels of dissociation symptoms than

nonfamilial trauma and no trauma (weights: familial trauma = 2, nonfamilial trauma = −1, no trauma = −1) for both parent report, $t(94) = 2.48$, $p < .05$, $r_{\text{effect size}} = .25$; and child report, $t(94) = 2.03$, $p < .05$, $r_{\text{effect size}} = .21$.

Attention Manipulation Check

The divided attention instructions directed children to both respond to the colors and study words for a memory test. Thus, we tested the effect of attention condition on overall free recall to confirm that the manipulation worked. Indeed, children recalled more words in the divided attention condition (when they were instructed to name colors *and remember* words) than the selective, $F(1, 83) = 89.69$, $p < .001$, partial $\eta^2 = .52$.

Stroop Data

Reaction time data were cleaned to delete all trials in which either (a) the child made the wrong key press or (b) reaction times were greater than 2,500 or less than 200 ms. Following the procedure used by DePrince and Freyd (1999), individual data were cleaned such that reaction times were brought back to 2.5 *SD* above the mean for each individual in each condition before calculating group means. Means and standard deviations for incongruent and neutral conditions by group are reported in Table 1. The mean reaction time to neutral words was subtracted from the mean reaction time to the incongruent trial (i.e., *red* appears in green) for each individual to calculate a mean Stroop score.[2] Higher scores reflected interference caused by the incongruent trial relative to reading time for neutral words. By using the neutral words as the baseline condition (vs. a string of *xxx*'s as in DePrince & Freyd, 1999), we controlled for general reading processing speed, which is important in studies of school-age children where variation in reading skills is expected. One-sample *t* tests indicated that the interference scores differed from zero in the selective

TABLE 1. Mean (*SD*) reaction time by condition and trauma exposure group.

Group	No Trauma	Nonfamilial Trauma	Familial Trauma
Selective–Incongruent	729.76 (151.78)	707.24 (165.42)	761.75 (190.16)
Selective–Neutral	721.24 (171.41)	686.21 (149.16)	718.66 (148.55)
Divided–Incongruent	847.15 (181.13)	780.36 (151.62)	862.42 (230.26)
Divided–Neutral	859.18 (162.49)	794.73 (218.30)	892.81 (242.76)

attention, $t(96) = 2.09$, $p < .05$; but not divided attention, $t(96) = -1.02$, $p = .31$, versions of the task.

To test the interaction of Attention (selective vs. divided) × Dissociation, we could dichotomize dissociation into high versus low and conduct a 2 × 2 repeated measures analysis of variance. To avoid dichotomizing the dissociation score, however, we created an *interference difference score* by subtracting the divided Stroop score from the selective Stroop score. In this way, we were able to examine the relative performance under divided and selective attention conditions in a single score and, in turn, to use correlation and regression to test our hypotheses with a continuous predictor variable (dissociation scores). Bigger interference difference scores indicated greater interference in the selective attention condition and less in the divided condition; smaller scores indicated less interference in the selective condition and more in the divided condition. A significant positive correlation between dissociation and interference difference scores was equivalent to an interaction of Dissociation × Attention condition where high dissociators showed less interference in the divided attention condition and more in the selective attention condition, relative to low dissociators who showed the opposite pattern.

Correlations between trauma exposure status, parent- and child-reported dissociation, and the interference difference scores are reported in Table 2. As predicted, higher dissociation scores per child report were associated with higher interference difference scores. Guardian reports of dissociation were unrelated to interference difference scores.

TABLE 2. Correlations ($N = 97$) between parent- and child-reported dissociation and interference interaction scores.

Variable	Guardian-Reported Dissociation	Family Trauma Status	Stroop Interference Score
Child-Reported Dissociation	.47**	.21*	.24*
Guardian-Reported Dissociation		.25*	.11
Family Trauma Status			.10

Notes:
*$p < .05$.
**$p < .001$.

We next tested whether interference difference scores could predict variance in child-reported dissociation scores above and beyond family violence status. The interference difference score for incongruent trials and family violence exposure (weights: familial trauma = 2, nonfamilial trauma = −1, no trauma = −1) were regressed on child-reported dissociation scores with family violence entered on Step 1. At Step 1, the model was significant, $F(1, 95) = 4.18$, $p < .05$, $R^2 = .04$. When the interference interaction difference score for incongruent trials was added in Step 2, the model was again significant, $F(2, 94) = 4.81$, $p = .01$, $R^2 = .09$, with a significant increase in R^2, $\Delta F(1, 94) = 5.24$, $p < .05$. In Step 2, interference difference scores ($\beta = .23$, $p < .05$) explained unique variance in dissociation scores; family violence status ($\beta = .18$, $p = .07$) approached conventional significance levels.

DISCUSSION

The current study contributes to a growing body of research demonstrating differences in information processing as a function of both dissociation level and attentional task demands. In particular, children's reports of higher levels of dissociation were associated with *less* interference under divided attention demands (relative to those on selective attention); lower levels of dissociation were associated with the opposite pattern. This is the first study of which we are aware to report interactions between dissociation and attentional demands on interference control in children. Notably, though, we did not replicate the findings with parent report of dissociation. Although child and parent report of dissociation were related ($r = .46$), there is reason to believe that parents may underestimate children's dissociation levels because dissociation is an internal experience that may or may not manifest in visible behaviors for observers. In fact, the Child Dissociative Checklist (parent report) specifically taps observable dissociation-related behaviors (e.g., showing rapid changes in behavior), whereas the Adolescent Dissociative Experiences Scale (child report) taps internal experiences (e.g., feelings of confusion, feeling in a fog).

Several theorists have argued that dissociative style involves unique attentional abilities under particular cognitive demands in adult samples (e.g., DePrince & Freyd, 1999; Elzinga et al., 2000, 2007). These studies have generally depended on dividing participants into groups based on a dichotomized dissociation score or patient status (e.g., dissociative

disorder patients vs. healthy controls). Furthermore, authors have generally assumed that the cognitive performance observed was a byproduct of a dissociative processing style (e.g., DePrince & Freyd, 1999), a view that makes sense given that findings are generally observed when comparing extreme groups (e.g., patients vs. nonpatients, or high vs. low dissociators). For example, based on comparisons of participants who scored high and low on a measure of dissociation, DePrince and Freyd (1999) suggested that chronic dissociation over time might increase the individual's ability to deal with multiple streams of information.

The current study stands out amid this burgeoning literature because a *continuous* measure of dissociation interacted with attentional demands *in children*, raising important developmental considerations. Specifically, these data suggest that interactions between dissociation and attention occur earlier in development than previously described. Thus, these findings point to the need for future research to evaluate whether certain types of executive function alterations (in this case, interference control) might represent (or be a cognitive marker of) a risk factor for dissociation rather than (or in addition to) a consequence of dissociative experiences. Perhaps individual differences in executive function, in combination with trauma exposure, contribute to the development of dissociative tendencies. Furthermore, these findings stand out from the adult literature in that a *continuous* measure of dissociation (rather than extreme groups) interacted with attention demands to predict interference control performance. Thus, these findings raise interesting questions about the *nature* of dissociation at different points in development. Perhaps we see the interaction with a continuous measure of dissociation in childhood and extreme groups in adulthood because dissociation falls on a continuum earlier in development with transactions over time than separating individuals categorically into pathological and nonpathological dissociators.

Limitations

Interpretation of these findings should be cautious for several reasons. Self-selection biases inherent in community-based recruiting may create challenges in generalizing these findings. For example, we may have tapped more normative than pathological dissociative processes in this community-based sample relative to a clinic-referred sample. We relied on parent report of child trauma history and thus may have included false negatives given parents' potential concerns about mandated

reporting. Every effort was made to minimize false reports by developing procedures to allow parents to report on trauma history anonymously; however, the relationship between family violence exposure and dissociation scores may have been decreased because of error variance caused by false negatives. For six children reported to have been sexually abused by an adult, we did not have information on the victim–perpetrator relationship; thus, these children may have been misclassified and error variance increased. Furthermore, the questionnaire used to assess trauma exposure did not allow us to examine contextual factors, such as age of onset or frequency of exposure to potentially traumatic events, that may be important contributors to cognitive processing. However, given concerns that parents may underreport children's experiences or symptoms, a strength of the study was the use of both parent and child report of dissociation. We found that parent- and child-report scores were strongly related and that the internal consistency of child reports was excellent.

In terms of the Stroop task, we did not test whether children in the current sample found the neutral words to in fact be neutral in content. Research assistants not involved in this project rated the neutral words as neutral; however, future research should confirm the valence of words used in the specific population tested. Although children, on average, showed interference in the selective attention condition, their interference scores, on average, did not differ from zero in the divided attention condition. The use of key presses (rather than voice responses as used by DePrince & Freyd, 1999) may have created a less sensitive measure of interference. The field would benefit from additional research using different types of attentional manipulations and response formats with child samples.

The current study did not include trauma-related stimuli to examine interference related to the emotional content of words. This will be important in future research, particularly for clarifying directional relationships between information processing and dissociation. In particular, if differential performance of highly dissociative individuals results from chronic coping with trauma-related memories (e.g., Elzinga et al., 2007), one would expect to see larger effect sizes in response to trauma-related stimuli than neutral stimuli. If, however, differential performance is a risk factor for the later development of dissociative problems or a more general cognitive correlate of dissociation, one might expect effect sizes to be approximately the same, regardless of stimuli content.

Clinical Implications and Future Directions

In the current study, interference control improved under divided (relative to selective) attention conditions as dissociation level increased. Thus, consistent with the adult literature, there appear to be unique conditions under which dissociation is actually associated with improved performance (DePrince & Freyd, 1999; Elzinga et al., 2007; Simeon et al., 2006). As research further specifies these conditions, clinicians may have opportunities to help clients identify and select environments that support clients' information-processing styles. In the case of the current study, the advantage was seen in divided relative to selective conditions; however, many of the environments in which children must function (e.g., school settings) demand focused attention. Children may engage in behaviors that otherwise appear disruptive (e.g., fidgeting, talking in class) in an effort to manage or influence their attentional environment (Becker-Blease & DePrince, 2005; DePrince & Freyd, 1999). Thus, this body of research suggests that clinicians should evaluate the function of problem behaviors that may have their roots in regulating the attentional environment. Furthermore, as the number of empirical studies linking dissociation and attention variables increases, clinicians should consider assessing for dissociative problems when children are reported to have trauma histories and disruptions in attention.

We propose several directions for future research. First, empirical research on cognitive correlates of dissociation should be extended more fully to children. In the adult literature, the use of experimental methods to evaluate information processing in dissociation has been critically important to furthering researchers' understanding of dissociative phenomena. However, the adult literature makes considerable inferences about development. To test these developmental assumptions, research with children is urgently needed. Second, longitudinal methods should be used to test whether some of the unique cognitive correlates of dissociation (in this case, the interference interaction) are makers of preexisting individual differences that, when combined with certain types of trauma exposure, contribute to the development of dissociative tendencies. A handful of recent studies with adults suggest that performance on cognitive tasks prior to adult-onset trauma predicts PTSD (e.g., Kremen, Koenen, & Boake, 2007; Parslow & Jorm, 2007); however, these studies did not evaluate contributions of child trauma exposure or dissociation as an outcome. Longitudinal work with children, therefore, offers invaluable opportunities to test whether alterations in cognitive performance are risk factors for and/or consequences of dissociation.

NOTES

1. Of the 32 children in the family violence group, 6 were reported to have experienced sexual maltreatment only, and the nature of the relationship to the adult was not specified. Because familial trauma could not be ruled out in these six cases and exposure to sexual abuse was more similar to the events experienced by those in the familial trauma group than the nonfamilial trauma group (e.g., medical traumas, accidents), these 6 children were classified in the familial trauma group.

2. Not surprising given variability in children's reaction times, a handful of outlying data points were noted in interference scores. Analyses using winsorized data that brought outlying data points back to 3 *SD* above the group mean were comparable to those using the original interference scores.

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Links Between Dissociation and Role Play in a Nonclinical Sample of Preschool Children

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ABSTRACT. Children's role play activities are included in symptom checklists of dissociative disorders, yet little is known about the potential relation between individual differences in role play and dissociative behaviors in normative development. This issue was examined in a study of 147 children aged 3 and 4 from a nonclinical population. Parents completed the Child Dissociative Checklist (CDC; F. W. Putnam, K. Helmers, & P. K. Trickett, 1993) and a questionnaire about their child's role play, fears, behavior problems, and dreams. Children were also interviewed about these same items. Dissociation was significantly related to parent report of fears, problem behaviors, and nightmares. These results are consistent with the view that CDC scores reflect some degree of difficulty in children's lives. Children who engaged in role play, particularly children with imaginary companions, scored higher on the CDC than other children.

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However, role play was not related to the measures of fears or problem behaviors. The results suggest that a distinction between pathological and nonpathological dissociation is warranted, with role play activities being more closely linked to the latter. Measurement of dissociation in preschoolers is discussed.

KEYWORDS. Role play, imaginary companions, nonpathological dissociation, measurement

During the preschool years, many children invent imaginary people and animals that are talked about, interacted with, or impersonated on a regular basis. Harris (2000) referred to these activities as "role play" to distinguish them from pretend play that does not involve imaginary characters (e.g., pretending that a block is a truck). Recent research indicates that role play is common and psychologically healthy. As many as 65% of children have created imaginary companions by the time they are 7 years old (Taylor, Carlson, Maring, Gerow, & Charley, 2004), and children who engage in role play score higher on theory-of-mind tasks (S. M. Carlson, Mandell, & Williams, 2004; Taylor & Carlson, 1997), are rated as producing more smiles and laughter in social play interactions (Singer & Singer, 1990), and outperform other children on tests of creativity (Hoff, 2005).

Nevertheless, there are red flags associated with this type of play. Early research often linked the creation of imaginary companions with psychological problems (Bach, 1971; Nagera, 1969; Sperling, 1954; Svendsen, 1934), and some recent studies have described children with imaginary companions as less socially competent and more anxious than other children (Bouldin & Pratt, 1999, 2002; Harter & Chao, 1992). In particular, vivid interactions with imaginary companions are often interpreted as reflecting a high degree of dissociation or even being a marker of a dissociative disorder. Some of the empirical evidence for this claim comes from retrospective studies. For example, Dierker, Davis, and Sanders (1995) found that college students who reported having at least one imaginary companion during their childhood scored higher on the Dissociative Experiences Scale (E. B. Carlson & Putnam, 1993), and those students who reported having highly vivid images of their imaginary companions scored even higher (but still below the cutoff for pathological dissociation) than students in the low vividness group. In addition, adults with dissociative identity disorder often report having had vivid fantasy lives as children, such as having a cast of imaginary companions (Bliss, 1984; Lynn, Rhue, & Green, 1988; Sanders, 1992). These imaginary companions are often reported by adult and adolescent patients to be the first signs of what later became alter personalities (Putnam, 1991). However, there are limitations in the interpretation of retrospective data. It is possible that it is the maintenance or availability of personal memories for imaginary companions (e.g., occurring in the context of treatment) that distinguishes these individuals rather than the childhood experiences themselves.

Clinical observations and research with children who have been diagnosed with dissociative disorders also suggest a link between role play activities and dissociative problems (Putnam, 1997; Silberg, 1998b). Dissociative symptoms that involve redefining reality constraints, altering the sense of self, and altering the identities of others (Putnam, 1991) are all apparent in children's role play. For example, a child might save a place for his or her imaginary monkey at the dinner table, then decide to *be* the monkey, and finally designate his or her sibling as the monkey. Thus, it is not surprising that having an imaginary companion is listed as one of the process symptoms of pathological dissociation in children (Putnam, 1991). This link has led some investigators to posit that high fantasy, in combination with childhood trauma, is a predisposing factor for dissociative disorders (Lynn et al., 1988; Powers, 1991; Young, 1988).

What are the characteristics that distinguish dissociative symptoms from normative role play? Children who have been diagnosed with dissociative disorders often provide descriptions of their alter personalities that sound very similar to psychologically healthy children's descriptions of their imaginary companions or pretend identities. On the basis of clinical observations, Silberg (1998b) proposed three main differences between pathological and normative experiences of imaginary companions: whether the child or the imaginary companion has control, whether the child feels bothered by the presence of the imaginary companion, and whether the imaginary companion gives the child competing messages about how to behave. Dissociative children also tend to have vivid visual and auditory images of the imaginary companions that make them seem almost like hallucinations. Although normative role play identities (referred to as *elaborated play identities* by Putnam, 1997) as well as imaginary companions share similarities with alter personality states, Putnam (1997) described normative role play as playful and stated that its crucial feature is that the characters never control, intimidate, or frighten the child.

Although guidelines for distinguishing normative and pathological forms of role play are helpful, the line between the role play of healthy children and activities observed in children who have dissociative disorders is not so clear cut. It is not uncommon for children to describe their pretend friends as not only vivid but also disobedient, bossy, argumentative, and unpredictable (Bender & Vogel, 1941; Jersild, Markey, & Jersild, 1933; Taylor, 1999; Taylor & Carlson, 2002). In particular, children's feelings of being controlled or annoyed by imaginary companions have been underestimated in nonclinical samples. Taylor, Carlson, and Shawber (in press) found that almost a third of the descriptions in a normative preschool sample included elements of uncontrollability (e.g., "He bothers me when I'm trying to read").

So how should children's role play activities, especially interactions with imaginary companions, be evaluated with respect to dissociation? Clearly, it is important to identify dissociative experiences of children from an early age in order to better understand the development of dissociative disorders. In fact, increasing numbers of dissociative disorder cases have been reported for young children as a result of greater awareness of childhood dissociation and the availability of behavioral checklists for clinical screening (Putnam, 1997). Just as important, however, is the study of nonpathological dissociation in its own right (Becker-Blease et al., 2004; Putnam, 1997). Several normative developmental processes might contribute to young children "outgrowing" dissociative tendencies, such as emotion regulation, theory of mind, and conscious control of thought (i.e., executive function). At the same time, our review of the literature suggests that there are likely to be enduring individual differences in nonpathological dissociation that are linked to fantasy proneness and imagination, traits that are often considered adaptive in people of all ages (e.g., Göncü & Gaskins, 2006; Singer, Golinkoff, & Hirsh-Pasek, 2006).

Given the dearth of evidence on dissociation in early childhood and its parallels with role play activities, the goal of this study was to investigate the relation between individual differences in role play and nonpathological dissociation in preschool children. We assessed dissociation with the most widely used tool, the Child Dissociative Checklist (CDC; Putnam, Helmers, & Trickett, 1993). The CDC was developed as both a clinical screening instrument and a research tool designed to quantify dissociative behaviors in children. It was designed to be completed by parents or other adult observers. The CDC has been validated with a dissociative-disordered group of children as young as 3 years old (Putnam & Peterson, 1994) and has been used to assess normative levels of dissociation in preschoolers (Macfie, Cicchetti, & Toth, 2001).

In addition to completing the CDC and answering questions about their children's role play activities, parents in this study provided information about their children's behavior problems, fears, and dreams. Questions about behavior problems and fears were included because these are common difficulties in children's lives, yet, in the extreme, can be symptoms of trauma (Briere et al., 2001). We were interested in the extent to which reports of behavior problems and fears might be related to children's dissociation behaviors as assessed by the CDC. We asked about dreams because nightmares are also a relatively common childhood difficulty that is included in some assessments of childhood trauma (Briere et al., 2001). Finally, to cross-validate and augment parent reports, we collected information about role play activities, behavior problems, fears, and dreams by interviewing the children themselves.

We hypothesized that engagement in role play activities would be correlated with higher dissociation scores on the CDC, even within a non-clinical sample. This result might suggest that dissociative tendencies are both normative in early childhood and best conceptualized along a continuum. We also investigated, however, whether the relation would persist after we removed items in the checklist having to do with imaginary companions and role play explicitly. If the relation holds only with those items included, then it would suggest that a distinction between pathological and nonpathological dissociation is warranted, with role play falling more closely into the latter category. The analyses of behavior problems, fears, and dreams were exploratory, but to the extent that these factors have been associated with both fantasy and dissociation in prior theory and research, we were interested in the possibility that the CDC would be correlated with these measures of everyday childhood difficulties.

METHOD

Participants

A total of 152 preschool children and their parents took part in this study. Data from five children were excluded because the parents did not complete the CDC. The remaining 147 children had a mean age of 4.0 (*SD* = 5 months; range = 3.4–4.8 years; 74 girls and 73 boys). Data on

income and ethnicity were not collected, however, the demographic of the area where the study was conducted was predominantly White and middle class. Children were recruited by posting advertisements in local day care centers and preschools and by sending letters to parents of 3- and 4-year-old children who were identified from birth announcements in the local newspaper.

Child Measures

Children were tested individually in a university child study laboratory. Once the child and experimenter were seated at a small table, the study was explained and verbal consent was obtained. Because the purpose of the study was to measure individual differences, each participant received tasks in a fixed order, as follows.

Peabody Picture Vocabulary Test–Revised. This is a standardized measure of receptive vocabulary (L. M. Dunn & Dunn, 1981). The child's task was to select the picture (out of four) considered to illustrate best the meaning of a stimulus word presented by the experimenter. Testing continued until children erred on 8 out of a set of 12 items. Standardized scores were used in analyses.

Role play. Children were asked about imaginary companions in the following way: "Now I'm going to ask you some questions about friends. Some friends are real like the kids who live on your street, the ones you play with. And some friends are pretend friends. Pretend friends are the ones that are make-believe, that you pretend are real. Do you have a pretend friend?"

If children responded "yes" to this question, the experimenter gathered more detailed information about the imaginary companion(s), including its name, gender, physical appearance, whether it was a toy or completely pretend, what the child liked and disliked about the friend, and where the friend lived and slept.

In past research on imaginary companions, it was found that some children described an animal or person they pretended to be on a regular basis rather than an imaginary entity that served the function of a friend. This kind of impersonation is a relatively common pretend activity that some researchers consider to be closely related to the creation of imaginary companions (Ames & Learned, 1946; Partington & Grant, 1984). To find out more about impersonation, we asked all children the following questions:

1. Do you ever pretend to be an animal? What animal do you pretend to be?
2. Do you ever pretend to be a different person? What person do you pretend to be?
3. Have you ever pretended to be anything else, like a machine, airplane, or something like that? What sort of thing did you pretend to be?

Dreams, fears, and problems. After completing the questions about role play, children were asked if they have dreams at night when they sleep and, if so, to describe them and indicate if the dream occurred more than once. If children described a bad dream(s), they were asked if they had ever had a good dream (and vice versa) and to describe it.

Children were then asked if they were afraid of any of the following: ghosts, rabbits, monsters, the dark, Big Bird, dogs, and being alone. Two of the items (rabbits and Big Bird) were included so that the list would have at least two items that were likely to elicit "no" responses from the children. This allowed us to identify children who had a "yes" response bias. However, we found that only three of the children said "yes" to the entire list of items. The analysis remained the same with and without these children, so we report the results for the entire sample.

Finally children were told, "Sometimes children do things that their parents don't like." They were asked whether their parents ever got mad at them for the following types of behaviors: breaking things, making a mess, making too much noise, fighting with brothers and sisters, and/or not wanting to go to bed. Although there were more children who showed a "yes" or "no" bias in response to problem behaviors than to fears, these children did not differ from those who did not show a response bias, so they were included in the following analyses.

Parent Measures

Parents completed a questionnaire that asked about a range of behaviors including role play, dreams, fears, and problems.

Role play. The role play section of the questionnaire began with the following definition of imaginary companions:

> An imaginary companion (IC) is a very vivid imaginary character (person, animal) with which a child interacts during his/her play and daily activities. Sometimes the companion is entirely invisible; sometimes the companion takes the form of a stuffed animal or doll.

An example of an imaginary companion based on a stuffed animal is Hobbes in the popular comic strip "Calvin and Hobbes."

Parents were asked if their child had an imaginary companion and to provide information about it, including the imaginary companion's name, gender, and physical appearance; the age of the child when it first appeared; whether it was human; and whether the child makes a special voice for it.

Parents also reported whether their child ever pretended to be an animal, person, or machine, and how often their child engaged in impersonation (everyday, frequently, occasionally, only once or twice).

Dreams, fears, and problems. Parents were asked if their child ever reported dreams or nightmares and, if so, to describe the content. Then parents were asked to indicate the extent to which their child was afraid of the following on a scale of 1 (*not afraid*) to 5 (*very afraid*): ghosts, monsters, the dark, dogs, and being alone.

Finally, parents were asked if any of a list of child behaviors caused problems for them and, if so, to indicate how often they reprimanded their child for that behavior (frequently, sometimes, not very much). The child behaviors were as follows: breaking things, making a mess, making too much noise, fighting with brothers and sisters, not wanting to go to bed, not doing what he or she is asked to do, and not wanting to be left at day care or with a sitter.

CDC. Parents were told that dissociation is a type of "spacing out" behavior that can occur in a variety of ways, and that it is normal for children to dissociate to some extent and to do so more often than adults. Then they were asked to fill out the CDC, Version 3 (Putnam et al., 1993). The exact wording of some of the items was slightly changed as follows to make the checklist more appropriate for use with young children (see also Table 1): The word *school* was replaced with *preschool* throughout, and three items referring to regressions in maturity level of behavior were changed to include age-appropriate examples (i.e., "gets lost easily" was deleted from Item 4; "skills" in Item 6 was replaced by "motor skills"; "multiplication tables, spelling, artistic ability" in Item 6 was replaced by "numbers and alphabet"; "a 12-year-old use of baby-talk, sucks thumb or draws like a four-year-old" in Item 7 was replaced by "uses baby-talk, wets bed or sucks thumb [when bedwetting or thumb sucking has not occurred for some time]"). Parents were instructed to answer each item according to how well it described their child's behavior currently or within the past 12 months on a scale of 0 (not true), 1 (somewhat true), and 2 (very true).

TABLE 1. Average endorsement by parents of items in the child dissociative checklist.

Item Number	Item Content	Mean Score (*SD*)
3	Rapid changes in personality	.82 (.70)
5	Poor sense of time	.68 (.69)
19	Talking to/arguing with self	.60 (.69)
9	Obvious lying	.58 (.61)
11	Rapid-changing physical complaints	.48 (.66)
8	Difficulty learning from experience	.46 (.59)
2	Trance-like states	.38 (.55)
16	Intense outbursts of anger	.35 (.61)
10	Refers to self in the third person	.32 (.54)
6	Variation in skills, knowledge	.30 (.57)
7	Regressions in age level of behavior	.29 (.56)
4	Unusually forgetful, confused	.29 (.47)
15	Vivid imaginary companion(s)	.27 (.54)
1	Forgets/denies traumatic experiences	.16 (.45)
20	Two or more separate personalities	.12 (.39)
18	Unusual nighttime experiences	.10 (.32)
14	Reports hearing voices (may be imaginary companion)	.10 (.36)
13	Unexplained/self-induced injuries	.08 (.30)
12	Unusually sexually precocious	.07 (.25)
17	Sleepwalks frequently	.04 (.23)

RESULTS

Our goal in this study was to examine the relation between dissociation and children's role play activities in a normative preschool sample. We first present descriptive information about the distribution of CDC scores, followed by the relation of these scores to child and parent reports of children's problem behaviors, fears and nightmares. We then present the descriptive information about children's role play and finally an analysis of the relation between individual differences in dissociation and role play.

CDC

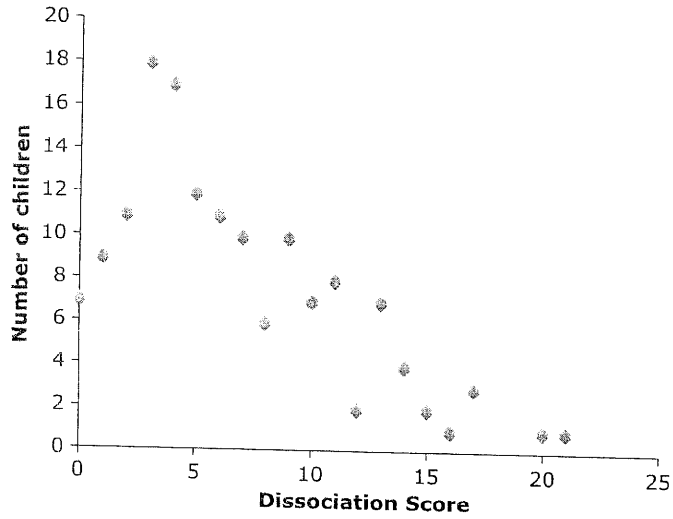
Table 1 lists the 20 items in the CDC in the order of their average endorsement by parents (maximum possible = 2). The method used to analyze the CDC is to add the scores for the 20 individual items to form a

single composite dissociation score out of 40 (Putnam et al., 1993). In the present sample, CDC scores ranged from 0 to 21, with an overall mean of 6.5 (SD = 4.5; see Figure 1). The scores for boys (M = 6.5, SD = 4.4) did not differ from the scores for girls (M = 6.5, SD = 4.7), $t(145) = 0.05$, *ns*. The CDC scores did not correlate with children's age or verbal ability, $rs(147) = -.04$ and .01, respectively.

CDC and behavior problems, fears, and dreams. Both parents and children were asked about the children's behavior problems and fears in an effort to collect some information about whether the CDC scores reflected difficulties in the children's lives. These results are discussed first, followed by the parents' and children's answers to questions about dreams.

Child reports for both behavior problems and fears were not significantly related to parent reports on these items, $r(135) = .14$, and $r(140) = .11$, respectively, or to CDC scores, $r(136) = .02$, and $r(145) = .02$, respectively. However, the parent reports were more informative. Parent reports of children's behavior problems ranged from 0 to 7, with an overall mean of 3.8 (SD = 1.7). This measure was significantly correlated with the dissociation measure, $r(138) = .25$, $p < .01$. In addition, parents were asked

FIGURE 1. Distribution of Child Dissociative Checklist Total Scores



to indicate how frequently the child was reprimanded for the problems on a scale of 0 (*not very much*) to 3 (*frequently*). The number of frequent problems ranged from 0 to 5 (out of 7), with an overall mean of .9 (SD = 1). The number of frequent problems was also related to the dissociation measure, $r(147) = .23$, $p < .01$.

Parents reported on their children's fears of each item on a Likert scale ranging from 1 (*not afraid*) to 5 (*very afraid*). Items were summed to compute an aggregate score out of 25. Fear scores ranged from 5 to 23, with a mean of 13 (SD = 4.1). Parent reports of fears were marginally correlated with the dissociation measure, $r(142) = .16$, $p = .052$.

Eight items in the parent questionnaire had overlapping content with trauma symptoms as listed in the Trauma Symptom Checklist for Young Children (Briere et al., 2001): nightmares, fear of the dark, fear of being alone, problems with parents regarding the issues of not doing what he or she is asked to, breaking things, getting into fights, not going to bed, and making a mess. Given that past research has used these items, we conducted a separate analysis for them. Children received a score of 1 ("yes") or 0 ("no") on each item, and the aggregate score out of eight was computed. These trauma-related scores were significantly correlated with the dissociation measure, $r(143) = .24$, $p < .01$.

Parent reports of children having nightmares were interpreted as another assessment of problems in the children's lives. In all, 61% of the parents said their children had nightmares (39% reported they did not). Parent report of child nightmares was related to CDC scores ($M_{\text{children with nightmares}} = 7.1$, $SD = 4.3$; $M_{\text{children without nightmares}} = 5.5$, $SD = 4.9$), $t(144) = -2.06$, $p < .05$.

In addition, child reports of dreams were analyzed as a measure of the extent to which children remembered and were able to describe their dreams. In order to be coded as a dreamer, the child had to report that he or she had dreams and give details of at least one dream (see Table 2 for examples of children's dreams). A total of 71% of the children met these criteria. A t test comparing the CDC scores for dreamers and nondreamers was not significant ($M_{\text{dreamers}} = 6.82$, $SD = 4.75$; $M_{\text{nondreamers}} = 5.72$, $SD = 4.01$), $t(144) = -1.33$, *ns*.

We also coded the developmental level that was evident in the children's descriptions of their dreams using Foulkes's (1999) three stages: (1) simple static images (e.g., a dream about "bears"), at 3 to 5 years; (2) simple event sequences with kinematic imagery (e.g., a dream about "bears running through the forest"), at 5 to 7 years; and (3) more complex sequences usually involving active participation of the dreamer

TABLE 2. Examples of children's dreams.

Stage 1 Dream Reports
Koala Bear
Ice cream and popsicles
Little Mermaid
Disneyland
Stage 2 Dream Reports
Ambulance ones . . . they take people to the hospital and they are good guys.
I remember one of my dreams. It's about Pepi and big dog down the alley . . . it bites Pepi.
Coyote. That was scary. Dad turned into a coyote.
Little Mermaid . . . There was a storm and a shark. Then I think all go under the sea.
Stage 3 Dream Reports
Sometimes I dream about monsters and it's sometimes scary. But I am not scared of it because I am a scientist about monsters. I always dream about monsters a lot.
. . . Vanessa and Rachel were dreaming in my dream. We pulled the curtain down and the monster started jumping. And it was real. And it cut the eyes of kids.
Lions trying to eat me.
Penguin took me up in heaven.

(e.g., a dream about "bears running through the forest after me"), beginning at 7 to 9 years. In this study, 42% of the dream descriptions were in Stage 1, 18% in Stage 2 and 40% in Stage 3 (see Table 2 for examples). Children reported a higher level of dream content than predicted by Foulkes; however, his procedure involved waking children up at night during REM sleep to immediately report the content of their dreams. In our study children reported the dream content long after the dream had occurred. Thus, we were collecting dreams that were particularly memorable and so might have received a higher score. We do not discuss the stages of the children's dreams further because dream stages were not related to any of the other measures in this study.

Role Play

On the basis of information in the child role play interviews and the parent role play questionnaires, we identified children who had invisible friends, personified objects, and/or pretend identities. We first provide descriptive data and relations to age and verbal ability, followed by the relations to dissociation.

Invisible friends. A child was categorized as having an invisible friend if the child said he or she had an invisible friend and provided a cogent

description of it. If the parent said the child did not have an invisible friend or reported that the child played with the invisible friend "only once or twice," the child's description had to be particularly convincing. The child was categorized as *not* having an invisible friend if (a) the child said that he or she did not have one, (b) the child said that he or she had an invisible friend but provided almost no information about it (e.g., no name, no description, said "I don't know" to most questions), (c) the child said that he or she had an invisible friend but then described a real friend (according to the parent), or (d) the child gave a minimal description of the invisible friend and the parent said the child did not have one or that the child played with the invisible friend "only once or twice." In all, 22 of the 147 children (15%; 6 boys and 16 girls) were categorized as having an invisible friend. In this sample, having an invisible friend was not significantly related to age, $t(145) = -0.77$, *ns*, or verbal ability, $t(145) = -0.03$, *ns*.

Personified objects. The criteria for coding personified objects were similar to those for invisible friends, with one additional criterion to differentiate between transitional objects and personified objects: For an object to be categorized as a personified object, the description of the object (in either the child's or the parent's report) had to go beyond the physical appearance of the object to include psychological details (e.g., "She is nice to me"). A total of 20 of the 147 children (14%; 9 boys and 11 girls) were categorized as having personified objects. This group was significantly older than children without personified objects, $t(145) = -3.03$, $p < .01$, but did not differ on verbal ability, $t(145) = -1.21$, *ns*.

Pretend identities. The information collected from parents was used to identify children with pretend identities because, as reported in past research (S. M. Carlson & Taylor, 2005), there tends to be insufficient variability in child reports for this type of role play; that is, most preschool-age children claim that they pretend to be another person or animal. A child was categorized as having a pretend identity if the parent reported that the child pretended to be someone or something (an animal, person, or machine) *every day* for a period of at least 1 month. In all, 15 children (10%; 12 boys, 3 girls) were categorized as having a pretend identity. Children who had a pretend identity did not differ in age, $t(145) = -0.28$, *ns*, but had significantly higher verbal ability, $t(145) = -2.80$, $p < .01$, compared to those without pretend identities.

Role play and behavior problems, fears, and dreams. None of the measures that were interpreted as suggestive of problems in children's lives

(i.e., child report of fears and problems, parent report of number of fears, number and frequency of problems, nightmares, and the eight symptoms that have been used in past research to assess trauma) were significantly related to role play. However, role play was related to child reports of dreams, $\chi^2(1, N = 147) = 6.38$, $p < .05$; 82% of the children who engaged in role play said they dreamed and described the content of at least one dream, compared with 63% of children who did not engage in role play.

Relation Between Dissociation and Role Play

Table 3 gives the mean CDC scores for children in each role play group (no role play, personified object role play, pretend identity role play, and invisible friend role play). Overall, there was a trend for children who engaged in any form of role play to score higher on the CDC than children who did not engage in role play ($M_{\text{role players}} = 7.4$, $SD = 4.3$; $M_{\text{non-role-players}} = 5.9$, $SD = 4.6$), $t(145) = -1.96$, $p = .05$. However, this trend was mostly due to the CDC scores of children who had invisible friends. The mean CDC score for children with invisible friends was significantly higher than the mean for children who did not engage in role play, $t(145) = -2.63$, $p < .01$. None of the other mean comparisons were significant.

The CDC was designed to assess a range of behaviors that are associated with dissociation, such as amnesia, self-destructive behaviors, disturbed sleep, behavioral fluctuations and depression, as well as fantasy. It is possible that the higher CDC scores for children with invisible friends reflected their higher overall level of dissociation. Alternatively, their higher scores could have been due to the two CDC items that ask explicitly about imaginary companion behaviors:

TABLE 3. Mean child dissociative checklist (CDC) scores (Total) and scores minus imaginary companion items as a function of role play group.

Group	None	Pretend Identity	Personified Object	Invisible Friends
CDC Total	5.91 (4.62)	5.87 (3.80)	7.05 (4.26)	8.77 (4.43)
CDC Minus Items 14 and 15	5.82 (4.55)	5.60 (3.48)	6.75 (4.12)	7.18 (4.13)

> Child reports hearing voices that talk to him or her. The voices may be friendly or angry and may come from "imaginary companions" or sound like the voices of parents, friends, or teachers. (Item 14)
>
> Child has a vivid imaginary companion or companions. Child may insist that the imaginary companion(s) is responsible for things that he or she has done. (Item 15)

Therefore, in addition to the total CDC scores, Table 3 shows the mean scores for the CDC excluding Items 14 and 15. With these items removed, there were no significant overall differences in the CDC scores for children in any of the role play groups. However, a two-way analysis of variance with gender and role play as between-group factors yielded an interaction effect, $F(1, 143) = 3.66$, $p = .06$. Further analyses indicated that the CDC scores (minus Items 14 and 15) for girls who engaged in role play were significantly higher ($M = 7.3$, $SD = 4.3$) than those for girls who did not engage in role play ($M = 5.1$, $SD = 4.3$), $t(72) = -2.1$, $p < .05$. This comparison was not significant for boys ($M_{\text{role players}} = 5.8$, $SD = 3.4$; $M_{\text{non-role-players}} = 6.5$, $SD = 4.7$), $t(71) = 0.6$, *ns*.

DISCUSSION

One of the most powerful resources available to young children for coping with stressful situations is their imagination. More specifically, many children create an imaginary companion or impersonate an imaginary character in response to life events ranging from the mundane (e.g., not having a real playmate available) to the traumatic (e.g., being abused by a parent). Important benefits of role play may be that children work through and make sense of events happening to them, explore alternatives to their own reality, and gain a sense of mastery and understanding of their own experiences (Bretherton, 1989; Partington & Grant, 1984).

Given that role play can function as a way to cope with trauma, and given the well-established links between trauma and dissociation, the creation of imaginary companions and pretend identities has been seen as a potential early marker of pathological dissociation. However, the vast majority of fantasy-prone children do not go on to develop a dissociative disorder. In fact, research has shown that children who engage in role play show advantages over other children in social understanding (Taylor & Carlson, 1997; see also Astington & Jenkins, 1995; J. Dunn, Brown,

Slomkowski, Tesla, & Youngblade, 1991) and that having an imaginary companion and other extensions of fantasy are better characterized as early markers of creativity than as the first signs of mental illness (Singer & Singer, 1990). Thus, the usefulness of information about role play in the diagnosis of dissociative disorders depends upon (a) the ability to accurately distinguish the characteristics of normative role play from the role play of dissociative children and (b) a clear understanding of the extent to which normative role play at a given age might influence dissociation checklist scores.

In past research we have argued that some of the characteristics of imaginary companions that are believed to be associated with pathological dissociation (e.g., vividness and uncontrollability) are actually quite common in nonclinical samples (Taylor et al., in press). In the present study, we addressed the issue of how normative role play is related to the most widely used assessment tool for dissociative disorders in young children, the CDC (Putnam et al., 1993). This was of interest because role play falls squarely in the category of "process symptoms" of pathologic dissociation, which include imaginary companionship, auditory hallucinations, and passive influence experiences (Putnam, 1991). Our results showed that 3- and 4-year old children who interacted with imaginary companions or impersonated imaginary characters received higher scores on the CDC than those who did not engage in extensive role play. As well, role play was related to children's ability to report their dreams. This finding supports previous research showing that individuals with imaginary companions have more frequent and more vivid nighttime dreams (Gleason, Jarudi, & Cheek, 2003; McLewin & Muller, 2006). However, having an imaginary companion or pretend identity was not associated with any of our measures of difficulties in children's lives (behavior problems, fears, or nightmares), that is, measures that are more likely to tap into the "behavioral," "affective," and "posttraumatic" symptoms of dissociation. In the following sections we discuss the results with regard to the development of dissociation, the relation between dissociation and developmental difficulties, and last the relation between role play and dissociation.

The Development of Dissociation

In this study, dissociation scores did not vary with gender, verbal ability, or age. Our finding of no difference for boys and girls in terms of dissociation replicates previous research with preschool children in which no

gender differences were found, even though dissociative identity disorder appears to be more common in women than men (Putnam, Hornstein, & Peterson, 1996). There is controversy in the literature regarding whether the disorder is associated with higher IQ. In our sample, the correlation was near zero, suggesting no relation in typically developing preschoolers, but it is possible that the relation is stronger in older children and adults. The lack of a relation between age and dissociation is surprising; however, it was probably due to the restricted age range of the children tested. Past research has shown that children tend to exhibit more dissociative behaviors than adults and that CDC scores decrease between the ages of 5 and 16 (Putnam, 1997). The CDC scores of children in our study were higher than those in a control group of children aged 5 to 8 years (M = 3.2) tested by Putnam et al. (1993). The relatively high CDC scores in our sample (M = 6.5) are consistent with the belief that there is an inverse relation between dissociation and age.

However, CDC scores are not always elevated in young children. In a study of maltreated and nonmaltreated preschoolers, Macfie et al. (2001) reported a mean CDC score of 1.8 for the control (nonmaltreated) group. One explanation for this discrepancy with our results might be the differences in demographics for the two samples. Macfie et al. were interested in examining the link between child maltreatment and dissociation. They recruited families with low socioeconomic status for their control group in order to have a sample that was comparable to the maltreated preschoolers. In previous research, children of low socioeconomic status have been found to have lower levels of pretend play (Youngblade & Dunn, 1995), and it is possible that parents of low socioeconomic status might be less likely to endorse items on the CDC that ask about pretending.

An alternative explanation is that we modified the wording of some items on the checklist (as described in the Method section) to be more appropriate for preschoolers, whereas studies that included a broader age range did not do so. This practice might have resulted in lower scores in previous studies because one is likely to circle 0 or leave the item blank if the example provided is not relevant. We believe that the examples included on the checklist should be age appropriate to better gauge the baseline level of dissociation at a given age or stage of development. Although it is important to be cautious when comparing our results with those of other studies of preschoolers, the present scores might be a more accurate assessment of normative dissociation at this age rather than an artifact of small changes to the wording; in contrast, we argue that other

studies might be *underestimating* nonpathological dissociation due to this factor. A more systematic comparison of the two versions in both clinical and nonclinical samples of preschool children would be necessary to examine this possibility.

In older children, a score of 12 or higher on the CDC is considered indicative of significant dissociative behavior (Putnam et al., 1993). Putnam (1996) found that 6.7% of nonmaltreated school-age children scored in the clinical range. In the study by Macfie et al. (2001), none of the preschool-age control group children scored in the clinical range. However, in our sample, 21 of the participants (14%) received a score of 12 or above. Without the imaginary companion items (Items 14 and 15), there were still 19 children (13%) who score above the clinical cutoff. Note, however, that in pathologically dissociative children, the mean CDC scores can be above 20 (Silberg, 1998a). These results suggest the importance of screening normative samples for trauma history (McLewin & Muller, 2006). Although we did not have a standard assessment of trauma, eight items in our questionnaire overlapped with items on the Trauma Symptom Checklist for Young Children (Briere et al., 2001). In a post hoc analysis (both with and without Items 14 and 15), the children who scored in the clinical range on the CDC also scored significantly higher on the eight trauma items than children who scored below the cutoff ($ps < .05$), suggesting that some children in our sample might have been considered clinical cases with more extensive screening; hence, caution is warranted when examining the mean CDC scores. However, the clinical-range participants did not differ from the remainder on role play or any other measures included in the study, and so including them did not appear to unduly influence the results.

The Relation Between Dissociation, Behavior Problems, and Fears

To examine the relation between normative dissociation and common difficulties in the preschool years, our questions about behavior problems and fears included a range of everyday issues. Parents' reports of the number of fears, the number and frequency of problems, and whether their children had nightmares were all associated with CDC scores. These findings suggest that the CDC taps into moderate childhood difficulties even in a nonclinical population. However, the information collected from children about their problems and fears did not have any relation to the children's level of dissociation or to the parents' reports of behavior

problems and fears. It is possible that 3- and 4-year-old children are not able to provide coherent information about these difficulties. In contrast, parent reports of behavior problems and fears might be more strongly correlated with dissociation than child reports because the CDC is also a parent-report instrument. That is, one is more likely to find consistency between two parent measures than between child and parent measures. It is also possible that the correlations would have been stronger if we had asked about more serious or non-normative fears or behavior problems.

The Relation Between Role Play and Dissociation

Our research showed that children who engaged in extensive role play (having personified objects, pretend identities, and invisible companions) scored higher than other children on the CDC; this was especially true for the group of children with invisible companions. When we reduced measurement overlap by omitting the questionnaire items about imaginary companions, this difference was no longer significant in the sample as a whole. It remained significant for girls only, however, despite the fact that girls and boys did not differ on their mean CDC scores. This result is likely due to the higher frequency of imaginary companions among girls versus the higher frequency of pretend identities among boys (S. M. Carlson & Taylor, 2005). Perhaps having imaginary others who are separate from the self is more closely linked with dissociative behaviors than enacting figures like the ones children see on television, at least from a parent's point of view.

These results suggest that one should be very cautious when using role play as part of the diagnosis of dissociative disorders in young children, especially in nonclinical samples. Instead, we argue that the results validate recent proposals to consider pathological and nonpathological dissociation and their sequelae independently (e.g., Becker-Blease et al., 2004). It is likely that individual differences in dissociation and fantasy may be linked throughout development in ways that are healthy and adaptive for coping and creativity (e.g., in actors, fiction writers, and scientists).

We can speculate on how the developmental pathways to high fantasy and dissociation might intersect. Lynn et al. (1988) proposed that there are two routes to the development of high levels of fantasy behavior: (a) encouragement from a significant adult, and (b) escape from an abusive environment (see also E. B. Carlson & Putnam, 1993). The pathway to dissociative tendencies in nontraumatized children might begin with a

fantasy-rich environment leading to a preference for role play activities, which in turn fosters nonpathological dissociation. Pathological levels of dissociation might result from the addition of trauma (e.g., child abuse) to this equation. It is also possible that the groups differ with respect to the ontological distinction, that is, the extent to which they experience imagined entities as real (Silberg, 1998b). Research with typically developing preschoolers suggests children are clear about the fantasy/reality distinction, although they are more prone to appear confused when the content of the fantasy is emotionally charged (for a review, see Harris, 2000; Samuels & Taylor, 1994; Taylor, Cartwright, & Carlson, 1993).

In conclusion, this study provides evidence for links between role play and nonpathological dissociation in preschool children. However, the results do not indicate that role play and dissociative experiences are synonymous. First, more research is needed to fully understand nonpathological dissociation in children. It will be important to test children across a wide age range to trace the developmental course of dissociative capacity in both clinical and nonclinical samples. Second, the ways in which pathological dissociation might depart from fantasy—such as amnesia for the event—remain to be delineated. Finally, potential causal links between role play and dissociation need to be put to empirical test. A longitudinal investigation of the development of role play and dissociation in low- and high-trauma-risk children would help to disentangle normal and pathological developmental trajectories.

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Children's expressed emotions when disclosing maltreatment☆

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ABSTRACT

Objective: Our goal was to examine children's expressed emotions when they disclose maltreatment. Little scientific research exists on this topic, and yet children's emotional expressions at disclosure may inform psychological theory and play a crucial role in legal determinations.
Method: One hundred and twenty-four videotaped forensic interviews were coded for children's emotional displays. In addition, children's trauma-related symptoms (depression, dissociation, and PTSD) and global adaptive functioning were assessed, and abuse type and frequency were documented.
Results: Most children in the sample evinced neutral emotion during disclosure. However, stronger negative reactions were linked to indices of psychopathology. Number of abuse experiences was inversely related to negative emotional displays.
Conclusion: Fact finders may profit from knowing that maltreated children do not necessarily cry or display strong emotion when disclosing maltreatment experiences. Nevertheless, predictors of greater negative affect at disclosure can be identified: fewer abuse experiences; higher global adaptive functioning; and for sexually abused children, greater dissociative tendencies.
Practice implications: Although further research is needed, practitioners should consider that children who disclose abuse may display relatively neutral affect despite having experienced maltreatment.

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Introduction

"She was extremely timid, and I think there's no way she'd put herself through this if she were lying. Became visibly upset when she began recalling molestation incidents; I think that she really didn't want to be there, but was, to testify" (Myers, Goodman, Redlich, & Prizmich, 1999, p. 418). This quotation from a juror in a child sexual abuse trial attests to the importance of children's affect when disclosing abuse. It suggests that individuals have certain expectations about how children "should" react if they were really abused.

The victim just referred to evinced negative emotions (anxiety, sadness, upset) expected of abuse victims (Regan & Baker, 1998). However, the one extant published study conducted in a forensic setting that concerned observed emotions in children as they disclosed abuse found that the majority of children were more likely to display relaxed or neutral behaviors than

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shame, sadness, or anger (Wood, Orsak, Murphy, & Cross, 1996). Is it possible that although most individuals believe that children should be upset when disclosing abuse, children are in fact more likely to seem relaxed or neutral? Can we identify factors that predict children's emotional expressions during disclosure of abuse?

The current study concerned children's emotional expressions during forensic interviews of suspected child maltreatment victims. Although emotional displays may or may not reflect actual emotional experience or feelings, emotional displays are of substantial interest in their own right (Ekman & Friesen, 1975), perhaps especially in the forensic context (Kaufman, Drevland, Wessel, Oversleid, & Magnussen, 2002; Kovera, Gresham, Borgida, Gray, & Regan, 1997). In the following sections, to generate hypotheses for our study, we consider expression of emotions, particularly negative ones, in relation to child maltreatment, age, and gender. We also address trauma-related psychopathology and abuse characteristics (e.g., frequency of maltreatment) as they may relate to negative emotions children express at disclosure. We then describe our study and its results.

Expression of negative emotions in maltreated children

It has been suggested that maltreated children learn that expression of negative emotions, like anger or distress, is unacceptable in certain contexts and could cause harm to themselves or family members (Briere, 1992; Cole, Zahn-Waxler, & Smith, 1994). Such children may employ strategies for managing negative emotions, such as hiding their emotional states from others in situations potentially related to abuse. During forensic interviews, this suppression of negative emotional display may contribute to stunted or neutral affect when children are discussing their abuse incidents with interviewers. This possibility is congruent with studies showing that maltreated children are likely to be dissuaded from expressing their feelings openly within the family and that they often use coping strategies to reduce emotional awareness (Briere, 1992; Cole et al., 1994; Harter, 1998), both of which may result in a neutral emotional display.

Age and gender differences in emotion expression

The ability to use strategies to hide negative emotions is also a function of children's age and gender. Preschoolers, compared to school-age children, are less able to use efficient strategies to hide their emotions (Harris, 1985; Harris, Olthof, & Meerum Terwogt, 1981; Saarni, 1989). Older children (ages 10-12 years) are more likely to report strategic suppression of their experienced emotions, especially sadness, than are younger children (ages 5-9 years; Fuchs & Thelen, 1988; Weiner & Handel, 1985).

However, older compared to younger children are more likely to understand the ramifications of child abuse allegations and legal investigations, and thus to express more distress. Older children show greater understanding of the legal system than do younger children (Block, Goodman, Oran, & Oran, 2005; Saywitz, 1989; Warren-Leubecker, Tate, Hinton, & Ozbek, 1989) and express more negative feelings about testifying (Goodman et al., 1992; Quas et al., 2005), which suggests that they may evince greater negative emotion during forensic-interview disclosures as well. Moreover, older children are generally more aware of society norms concerning sexual taboos and proper parental care (e.g., Goldman & Goldman, 1982), awareness that may result in greater distress during a forensic interview. Thus, we expected an age increase in emotional display when children disclose abuse in a legal context.

Gender may also be related to children's negative affect at disclosure. Boys and girls express emotions differently, with girls exhibiting less anger and more fear and sadness than boys (Belle, 1989; Belle, Burr, & Cooney, 1987; Fuchs & Thelen, 1988; Zeman & Garber, 1996), and boys being more successful at suppressing distress than girls (Alessandri & Lewis, 1996). Thus, we expected a significant gender difference in maltreated children's expressed distress during disclosure.

Trauma-related symptoms, psychological adjustment, and emotion expression

Child maltreatment is associated with adverse emotional reactions, such as depression, dissociation, and post-traumatic stress disorder (PTSD: Egeland, Sroufe, & Erickson, 1983; Kendall-Tackett, Williams, & Finkelhor, 1993; Putnam, 1997; Toth, Manly, & Cicchetti, 1992; Trickett & McBride-Chang, 1995). Emotional expressivity at disclosure may be affected by such trauma-related symptoms (Bonnano, Noll, Putnam, O'Neill, & Trickett, 2003; Bonanno et al., 2007). Maltreated children often evince symptoms of depression (e.g., Beitchman et al., 1992; Polusny & Follette, 1995), a potentially important predictor of maltreated children's expressed emotion during disclosure. Burnam et al. (1988) reported that 13% to 22% of abused children met criteria for depression compared to only 4% to 6% of non-abused children. Andrews (1995) demonstrated an association between depression symptoms and feelings of shame in adult female survivors of abuse. Shame is behaviorally manifested by downward head movements and gaze aversion (Bonanno et al., 2002), displays likely to be interpreted as indices of upset.

In addition, dissociation could lead some children to display neutral or stunted emotional affect when discussing abuse. Dissociation is a coping mechanism that enables an individual to deal with extreme stressors by psychologically escaping an otherwise inescapable situation. It is believed that dissociation can become habitual, resulting in psychopathology (Putnam, 2000). Highly dissociative children are at risk of developing chronic feelings of depersonalization and derealization, which may lead these children to appear emotionally stunted during a forensic interview (Bonnano et al., 2003). However, it is also possible that such children will become openly upset when required to articulate their highly stressful experiences.

Post-traumatic stress might also influence children's expression of emotion. Sufferers of PTSD typically show three types of symptoms: (a) re-experiencing the stressful event through flashbacks, nightmares, and daydreams; (b) avoidance behaviors, such as numbness and avoidance of thoughts and reminders of the trauma; and (c) hyper-arousal including sleep problems, difficulties in concentration, heightened startle responses, and irritability (American Psychiatric Association, 1994). These symptoms may affect children's emotional expressions during a forensic interview. For example, children who have repeated nightmares and flashbacks might be expected to become particularly distressed when discussing abuse. Putnam (1997) asserts that exposure to trauma-related stimuli (e.g., direct questions about the abuse) can increase the traumatized individual's susceptibility to re-experiencing abuse-related emotions. Conversely, children who have become emotionally withdrawn and numb as a part of their trauma response might be expected to evince less emotional upset.

It is also important to consider children's overall psychological adjustment. Recent research suggests that expression of positive emotion when discussing abuse is related to adjustment problems (Bonanno et al., 2007). To the extent that adjustment problems generally and trauma-related psychopathology specifically are correlated, the independent contribution of each should be determined. This was accomplished in the present study by inclusion of a measure of global adaptive functioning.

Child abuse characteristics and emotion expression

Child abuse characteristics, such as type and frequency of abuse, may play important roles in how children display emotion when disclosing abuse. For example, child physical abuse might be associated with greater anger (e.g., Hoffman-Plotkin & Twentyman, 1984), and child sexual abuse with greater shame (e.g., Bonanno et al., 2002). When adult females with histories of sexual abuse were asked to report how they felt emotionally during the sexual activities, victims' reactions fell into three categories: Guilt/Fear, Anger/Disgust, and Positive. Individuals in the Guilt/Fear group reported feeling guilty, afraid, ashamed, anxious, detached, and numb, and those in the Anger/Disgust category reported being angry, disgusted, and curious. Individuals in the positive emotions category reported feeling, for example, interested, special, important, and enjoyment (e.g., of the physical sensations). Of particular note was the finding that individuals in the Guilt/Fear group were more likely to be involved in repeated abuse incidences. That is, the children who were abused repeatedly (e.g., by a family member) were especially likely to report feeling ashamed, detached, and numb (Long & Jackson, 1993; see also Bonanno et al., 2002). In regard to the current study, such research might indicate that in a forensic interview, children who have been repeatedly abused might display stunted affect when disclosing abuse.

Overview

The present study focused on predictors of maltreated children's affect when they discussed incidents of abuse. Videotaped forensic interviews of abused children were coded, and indices of demographic information, abuse characteristics, and psychological functioning served as predictors.

Based on prior research (Wood et al., 1996), it was expected that the majority of maltreated children in our sample would evince neutral affect during disclosure. We considered neutral affect as an indifferent, flat, or calm expression, one that cannot be identified as expressing obvious negative affect (e.g., sadness, irritation, or anger) or positive affect (e.g., joy, happiness). Predictors of differences in children's emotional expressivity were also hypothesized. Specifically, older compared to younger children were expected to express greater emotional upset when they disclosed abuse. Males were expected to display less emotion than females. Further, greater depression was expected to predict more negative affect expression. We also tested the opposing hypothesis that children with more symptoms of dissociation would display less emotional expressivity versus the hypothesis that children with more symptoms of dissociation would display more emotional expressivity. We examined similar contrasting hypotheses for symptoms of PTSD. Finally, we expected that children who were repeatedly abused (measured by number of prior reported allegations) would express less upset during disclosure.

Method

Participants

The 124 children, ranging from 3- to 16-years-old ($M = 8.54$, $SD = 3.47$), were those who disclosed some form of abuse or neglect during a forensic interview conducted at an abuse-evaluation center. The sample was largely African American, female, and allegedly physically abused, sexually abused, and/or neglected (see Table 1).

The children had been removed from home by child protective services due to suspicions of maltreatment, or in a relatively few cases, brought to the center by caretakers. Caretakers who brought their children to the center received information about the study upon their arrival, and a staff member obtained their consent. For children who were wards of the state, consent was given by child protective services. Child assent was obtained as well. The study was reviewed and approved by Internal Review Boards at the child protective services department, the maltreatment evaluation center, and the University of California, Davis.

To be included, all children had a videotaped forensic interview and an affect rating provided by a forensic interviewer. Videotapes were included if the child disclosed some form of abuse or neglect and had a determination of maltreatment

Table 1
Characteristics of the sample.

Variable	Percentage	*N*
Gender		
Male	38%	47
Female	62%	77
Age		
3-5 years old	24%	30
6-8 years old	31%	38
9-16 years old	45%	56
Ethnicity		
African American	76%	94
Caucasian	13%	17
Hispanic	10%	12
Others	1%	1
Abuse type category		
Sexual Abuse	36%	45
Physical Abuse	43%	53
Neglect	21%	26

as indicated by the clinical staff at the evaluation center and/or by child protective services. Some of the videotapes were excluded due to poor sound or visual quality. Using these restrictions, a total of 124 tapes were coded for the present study. Our sample did not differ significantly from the entire sample ($n = 443$) in age, gender, abuse type, or race, χ^2s ≤ 1.99, ps $\geq .16$. Most of the children at the evaluation center did not experience a forensic interview, which was conducted only if a criminal case was being considered. There were no known refusals to participate, but our previous research on forensic and clinical interviews that encompassed the present sample indicated that approximately 18% of the larger sample did not disclose past abuse experiences (Ghetti, Goodman, Eisen, Qin, & Davis, 2002).

Coding of emotional expression

Interviewer ratings. At the end of the interview, the interviewer rated the child's upset and crying both for when the child entered the room and during disclosure. The scale for the child's negative affect ranged from 1 (very happy) to 6 (very upset), with 3.5 considered as neutral. The scale for the child's crying ranged from 1 (not crying) to 6 (hysterically crying), with 3.5 treated as moderately crying.

Researcher ratings. To establish inter-rater reliability, two researchers first jointly coded several tapes (not part of the current sample) using the same scales as those used by the interviewers at the child-abuse assessment center. All disagreements were resolved by discussion. After this practice period, the researchers independently coded 25% of the videotaped interviews, and these data were used to calculate reliability between coders and interviewers. Specifically, researchers rated the child's upset and crying upon entering the room and during disclosure, on the 6-point scales. The researchers were blind to the interviewers' and to each other's ratings and to hypotheses. Reliabilities were calculated within one scale point as an agreement. Proportions of agreement between the two raters, and between each rater and the interviewer, for negative affect at the beginning of the interview, ranged from .90 to 1.0. The proportions of agreement between the two raters, and between each rater and the interviewer, for negative affect when the child discussed/disclosed the abuse ranged from .75 to .95. The proportion of agreement between the two raters, and between each rater and the interviewer, for the cry scale was 1.0.

Psychological measures

Dissociative Experiences Scale for Adolescents (A-DES; Armstrong & Carlson, 1993). The A-DES, for 11-year-olds and older, is a downward extension of the DES (Bernstein & Putnam, 1986) that includes 30 items describing dissociative experiences (e.g., "When I am somewhere that I don't want to be, I can go away in my mind."). Children are asked to rate how often each experience happens to them on a 0-10 scale (0 = never and 10 = always). The A-DES has adequate reliability (alpha = .93), internal validity, and discriminant validity (Armstrong, Putnam, Carlson, Libero, & Smith, 1997). Reliability within the current sample was also adequate (alpha = .93). Higher scores indicate greater dissociative tendencies.

Child Dissociative Checklist (CDC). The CDC is an observer-report measure of dissociative behavior, ranging from normal to pathological, in 4- to 19-year-olds. A 3-point scale (0 = not at all true to 2 = very true) is used to indicate whether behaviors such as "Child frequently talks to him or herself, may use a different voice or argue with self at times" are characteristic of the child. In the present study, the CDC was administered only to caretakers who had been caring for the child for at least 2 months at the time of the assessment. The instrument is temporally reliable, with test-retest reliability coefficients ranging

from .61 to .69, and test-retest reliabilities for individual subscales ranging from .57 to .92 (Putnam, Helmers, & Trickett, 1993). The CDC is internally consistent (alphas = .80 to .95) and has obtained a Spearman-Brown coefficient of .94 (Putnam et al., 1993). In the current sample, alpha was .86.

Child Depression Inventory (CDI-S; Kovacs, 1983). The CDI-S is a widely used self-report measure of depression for 8- to 15-year-olds (Kovacs, 1983). For each of 10 items, children are asked to point to one of three statements that best represents how they felt in the past 2 weeks, for example "I feel sad: 0 (once in a while), 1 (many times), or 2 (all the time)." Higher numbers indicate elevated depression. The CDI-S is internally consistent, with alpha coefficients ranging from .71 to .89 (Kovacs, 1992). In the current sample alpha was .75.

Trauma Symptom Checklist-Child Version (TSC-C; Briere & Runtz, 1993). The TSC-C, a downward extension of the TSC-40, is a 54-item questionnaire designed to assess post-traumatic stress, dissociation, anxiety, anger, sexual concerns, and depression in 8- to 15-year-olds who have been abused and/or traumatized. Children indicate on a 4-point scale (0 = never to 3 = almost all of the time) how often experiences such as "Feeling nervous or jumpy inside" happen to them. Higher scores designate a greater number of symptoms. The inventory is psychometrically sound and predictive of maltreatment history (e.g., Briere, 1996; Briere & Runtz, 1993; Evans, Briere, Boggiano, & Barrett, 1994; Friedrich, 1993; Sadowski & Friedrich, 2000). The reliability within the current sample was high (alpha = .94).

Post-Traumatic Symptom Inventory for Children (PT-SIC; Eisen, 1997). The PT-SIC is a 28-item self-report measure of symptoms of posttraumatic stress in young children (4 years of age and up). The PT-SIC has excellent internal reliability (alpha = .91) and adequate test-retest reliability, $r = .88$, when administered to a clinical sample of maltreated children (Eisen, 1997). Within the current sample alpha was .89.

Global Assessment of Functioning (GAF; American Psychiatric Association, 1994). This measure is based on criteria described in the DSM-IV manual. The child's psychological, social, and educational functioning is rated on a 100-point scale. Higher ratings indicate higher levels of adaptive functioning. The GAF scale is almost identical to the Global Assessment Scale, which has high reliability, and good concurrent and predictive validity; it is among the most useful instruments for measuring psychological functioning (Endicott, Spitzer, Fleiss, & Cohen, 1976; Sohlberg, 1989).

Composite measures. All measures were standardized, and composite measures of depression, dissociation, and PTSD were created. The depression composite measure was the average of the CDI-S total score and the TSC-C depression subscale. A principal components analysis with promax rotation revealed that the two measures of depression (CDI-S and TSC-C) loaded on the same factor with 75% of the variance explained (alpha = .67). Similarly, the dissociation composite measure was the average of four scores: the CDC total score, the A-DES total score, and the two TSC-C dissociation subscales. A principal components analysis with promax rotation confirmed that the four measures of dissociation loaded on the same factor with 66% of the variance explained (alpha = .79). A principal components analysis with promax rotation revealed that the two measures of PTSD (PT-SIC and the TSC-C PTSD subscale) loaded on the same factor with 82% of the variance explained (alpha = .77).

Abuse characteristics

Abuse type. Abuse type was determined in conjunction with the child abuse evaluation program based on current medical and forensic evaluations, and previous history as reported by child protective services. Children were separated into three abuse status categories. A child was classified into the sexually abused category if he or she had a known history of sexual abuse based on child protective services reports, or if the current program investigation indicated that the child had been sexually abused. Specifically, the sexually abused group included children with a known history of sexual abuse alone or combined with other forms of maltreatment. A child was classified as physically abused if he or she had a known history of physical abuse according to child protective services reports, or if the current program investigation indicated that the child had been physically abused, but there was no history of child sexual abuse. A child was classified into the neglect category if he or she had a previous history of neglect, but no known history or current incidents of abuse (sexual or physical).

Number of abuse allegations. The number of abuse allegations was calculated based on the frequency of former sexual abuse, physical abuse, or neglect accusations indicated by child protective services.

Procedure

As a part of the child maltreatment assessment procedure, children individually received a forensic interview. During the interview, one of five forensic interviewers (blind to the study hypotheses) questioned the child about possible maltreatment using a semi-structured interview that minimized, but still included some, leading questions ("Has anybody ever hit or whooped you?" "Do you have enough food at home?" "Has anyone ever touched you on your private parts?" [asked after determining that the child understood the term "private parts"]). The interview often involved use of anatomical dolls and

Table 2
Means and standard deviations for key variables.

Variable	Gender		Abuse type			Overall	*N*
	Males	Females	SAB	PAB	Neglected		
Age	8.32 (3.59)	8.68 (3.42)	8.84 (3.56)	9.04 (2.85)	7.00 (4.09)	8.54 (3.47)	124
Negative affect at beginning of interview	2.74 (1.03)	2.52 (.90)	2.49 (.82)	2.87 (1.00)	2.27 (.96)	2.60 (.95)	124
Negative affect at disclosure	3.62 (.80)	3.73 (.97)	3.91 (.82)	3.64 (.90)	3.38 (.98)	3.69 (.90)	124
Frequency of abuse allegations	3.88 (.2.83)	5.04 (4.54)	4.80 (4.08)	4.65 (4.66)	4.14 (2.02)	4.60 (4.01)	112
Composite dissociation[a]	.14 (.91)	−.03 (.80)	.05 (.63)	.05 (.95)	.06 (1.03)	0 (1.00)	93
Composite depression[a]	.11 (1.1)	.19 (.98)	.05 (.90)	.24 (.102)	−.10 (1.27)	0 (1.00)	78
Composite PTSD[a]	−.05 (.95)	.05 (.95)	.06 (.93)	−.04 (.85)	.04 (1.33)	0 (1.00)	95
GAF	67.83 (9.29)	69.43 (8.04)	68.18 (7.80)	67.48 (9.42)	72.67 (6.85)	68.82 (8.54)	97

*Note. SD*s in parentheses. Dissociation, depression, and post-traumatic stress disorder (PTSD) composite measures were standardized (*Z* scored). GAF = Global Assessment of Functioning. SAB = sexual abuse. PAB = physical abuse. The *N*s reported are the original ones before imputing missing values.

[a] *z* scores.

body charts. During this interview, or right after, the interviewer rated the child's upset and crying in regard to when the child had entered the room and when the child had discussed the abuse.

At the end of a (separate) psychological consultation interview, a licensed clinical psychologist (blind to the study hypotheses) assessed the child's GAF. The child-report dissociation, depression, and PTSD measures were administered to age-appropriate participants within ±2 days of the forensic interview. Parents or caretakers who were available completed the CDC.

Results

Means for key variables are presented in Table 2. To preview, descriptive data concerning the overall demeanor of children at disclosure are presented first. Next, the relations among participant factors (age, gender, race), abuse factors (type of abuse, frequency of abuse), and psychopathology measures (depression, dissociation, PTSD, GAF) are elucidated. Finally, results of a multiple hierarchical regression analysis, conducted to detect the independent contribution of predictors of negative affect at disclosure, are described.

Negative emotional expression in maltreated children

Congruent with our expectation to find high proportions of neutral emotional display, 75% of the children in our sample evinced a neutral expression when disclosing abuse (their negative affect was coded at the midpoints, that is, at 3 or 4, of the 6-point scale). A neutral expression corresponded to flat affect, lack of emotional expression, blank stares, or monotone voice. Further, 98% of the children did not cry when disclosing the abuse; only three cried at that time.

Imputing missing data

Because of the complex nature of the study design and sample, it was not possible to obtain a complete data set on every participant. Mainly, this happened because the child was released from the program before completing all questionnaires. In a few cases, a negative affect at disclosure or a crying rating by the forensic interviewer was missing. In these cases, one of the researchers who had established reliability with the forensic interviewers completed the rating. To account for missing data, a linear regression interpolation method was used (see Elliot & Hawthorne, 2005, for review).

Predictors of negative emotional expression at disclosure

Type of abuse was recoded into two variables: SAB (child sexual abuse = 1, physical abuse or neglect = 0) and PAB (child physical abuse = 1, child sexual abuse or neglect = 0). Gender was coded as males = 0 and females = 1. Race was coded as African Americans = 1 and all other races = 2. As a first step, correlations were calculated. Significant associations were found for a subset of predictors concerning the ratings of emotional distress at disclosure for maltreated children (see Table 3). Specifically, number of abuse allegations was significantly but negatively correlated with negative affect at disclosure, indicating that children with a greater number of prior alleged abuse incidences expressed less upset at disclosure. SAB was significantly correlated with negative affect at disclosure, such that sexually abused children were rated as more upset at disclosure than were the other children. Negative affect at the beginning of the interview was also significantly related to negative affect at disclosure. In contrast to our prediction, psychopathology measures were not significantly correlated with negative affect at disclosure. Finally, physically abused children were more upset at the beginning of the interview than were the other children.

To control for interrelations among the variables, a multiple hierarchical regression was performed. First, we examined the individual scatterplots of each variable and the dependent measure (i.e., negative affect at disclosure). Because no outliers

Table 3
Correlation matrix for all maltreated children.

	Gender	Race	Age	SAB	PAB	Number of abuse allegations	GAF	Composite PTSD measure	Composite depression measure	Composite dissociation measure	Negative affect at beginning	Negative affect at disclosure
Gender	1											
Race	0.24**	1										
Age	0.05	0.03	1									
SAB	0.17*	0.06	0.07	1								
PAB	−0.23**	−0.13	0.12	−0.65***	1							
Number of abuse allegations	0.14	0.01	0.08	0.04	0.01	1						
GAF	0.09	−0.06	−0.11	−0.06	−0.14	−0.08	1					
Composite PTSD measure	0.03	−0.07	−0.08	0.05	−0.07	0.00	−0.18	1				
Composite depression measure	−0.01	−0.04	−0.39***	−0.09	0.06	−0.04	−0.10	0.24**	1			
Composite dissociation measure	−0.10	−0.07	−0.28**	0.01	−0.04	−0.06	−0.12	0.40***	0.27**	1		
Negative affect at beginning	−0.12	−0.01	0.10	−0.09	0.24**	−0.16	−0.14	−0.01	0.06	0.02	1	
Negative affect at disclosure	0.06	0.07	0.09	0.19*	−0.04	−0.22**	0.05	0.04	0.10	0.17	0.48***	1

Note. *$p < .05$, **$p < .01$, ***$p < .001$. Gender was coded as males = 0 and females = 1. Race was coded as African Americans = 1 and all other races = 2. GAF = Global Assessment of Functioning. PTSD = post-traumatic stress disorder. SAB = sexual abuse. PAB = physical abuse.

Table 4
Multiple hierarchical regression analysis: Predicting negative affect at disclosure ($N = 124$).

Variable	*B*	*SE B*	β
Step 1			
Negative affect at beginning of interview	.46	.08	.49***
Gender	.19	.15	10
Race	.10	.18	.05
Age	.01	.02	.03
Step 2			
Negative affect at beginning of interview	.48	.08	.50***
Gender	.13	.15	.07
Race	.09	.17	.04
Age	.01	.02	.02
SAB	.41	.19	.22*
PAB	.00	.20	.00
Frequency of abuse allegations	−.04	.02	−.20*
Step 3			
Negative affect at beginning of interview	.45	.08	.47***
Gender	.16	.15	.09
Race	.14	.17	.07
Age	.04	.02	.14
SAB	.50	.19	.27**
PAB	.10	.20	.05
Frequency of abuse allegations	−.04	.02	−.21*
Depression	.12	.09	.11
Dissociation	.25	.11	.20*
PTSD	−.03	.09	−.03
GAF	.02	.01	.17*
Step 4			
Negative affect at beginning of interview	.47	.07	.49***
Gender	.16	.15	.09
Race	.08	.17	.04
Age	.04	.02	.14
SAB	1.2	1.3	.64
PAB	.10	.19	.06
Frequency of abuse allegations	−.05	.02	−.22*
Depression	08	.09	.7
Dissociation	.14	.11	.12
PTSD	−.02	.09	−.02
GAF	.02	.01	.22*
SAB × Dissociation interaction	.52	.23	.20*
SAB × Frequency of abuse interaction	.03	.04	.10
SAB × GAF interaction	−.01	.02	−.47

Note. $R^2 = .24$ for Step 1 ($p < .001$); $\Delta R^2 = .05$ for Step 2 ($p < .05$); $\Delta R^2 = .09$ for Step 3 ($p < .01$); $\Delta R^2 = .04$ for Step 4 ($p = .07$). $^*p < .05$, $^{**}p < .01$, $^{***}p < .001$. Gender was coded as males = 0 and females = 1. Race was coded as African Americans = 1 and all other races = 2. GAF = Global Assessment of Functioning. PTSD = post-traumatic stress disorder. SAB = sexual abuse. PAB = physical abuse.

were detected, we created the regression model using information on all 124 participants (with missing values imputed). In each step of the model variables were entered simultaneously. The rationale for entering variables in each step was conceptual. In the first step, the negative affect score from the beginning of the interview was entered as a covariate. All participant factors (age, gender, and ethnicity) were entered at this stage. Abuse characteristics (abuse type and number of abuse allegations) were entered in the second step. Next, the psychopathology measures (depression, dissociation, PTSD, and GAF) were entered. In the final step, interactions between abuse type and the other significant factors (from the earlier steps) were entered. Results of the regression analysis are reported in Table 4.

The first step in the regression accounted for 24% of the variance in negative affect at disclosure. This result was due to the negative affect at the beginning of the interview which was positively related to negative affect at disclosure. Step 2 added 5% to the shared variance explained in negative affect at disclosure, with SAB and the frequency of abuse allegation as significant contributors. Accordingly, children who were sexually abused expressed more negative affect at disclosure compared to the rest of the sample, and children who had more abuse incidents expressed less negative emotion at disclosure. At Step 3, the dissociation and GAF psychopathology measures added 9% to the shared variance explained. Namely, higher dissociative symptom scores predicted less negative emotion at disclose, and higher GAF scores were associated with more negative emotion at disclosure. Note that although it is possible that the children who obtained higher scores on the GAF were more intelligent, a measure of short-term memory, which correlates with full-scale IQ, was not a significant predictor of negative affect at disclosure.

Finally, adding the interaction effects in Step 4 contributed 4% to the variance explained in the negative affect measure. As can be seen in Table 4, although SAB and dissociation were no longer significant predictors on their own, a significant

interaction between SAB and dissociation emerged. This interaction indicated that for children who had been sexually abused, a higher score on the dissociation measure predicted greater negative affect at disclosure.

Inspection of the distributions of all measures in the regression model suggested that none violated assumptions of normality. That is, measures of skewness and kurtosis were within the acceptable two standard deviation ranges for the psychopathology measures (depression, dissociation, PTSD, and GAF) as well as for the dependent variable (i.e., negative affect at disclosure; $.41 > sess > -.40$, $SEs = .22$; $.80 > seks > .37$, $SEs = .43$). Further examination of the residuals plots revealed that the linearity and homoscedasticity assumptions were not violated. Finally, measures of multicollinearity were also within the acceptable range ($1 < VIFs < 1.5$); thus, adding the interaction terms did not affect the stability of the model.

To the extent that our sample might have included children who, despite their disclosure, actually had not experienced maltreatment, we also examined the subset of cases in which corroborated evidence existed (i.e., cases that had the following types of evidence: medical evidence, confession by perpetrator, or eyewitness). The same pattern of results emerged when we analyzed only the corroborated cases.

Discussion

This study examined the characteristics of maltreated children's emotional display at time of disclosure of abuse incidents, as well as the unique predictors of these children's negative affect. It is generally expected that during their disclosures, child victims will be highly distressed, cry, and show other negative emotional reactions. This expected pattern of reaction seems to make their story more credible to jurors (Myers et al., 1999). However, our findings cast doubt on the validity of these expectations. Consistent with prior research (Wood et al., 1996), our study showed that most of the children displayed neutral affect when they discussed abuse incidents, and most of them did not cry.

Nevertheless, in line with our expectations, maltreated children who had a greater number of prior abuse allegations appeared less upset when discussing the abuse. It could be argued that abuse had become a regular part of these children's lives and therefore they had developed a stunted emotional reaction to the violence. Another possibility is that these children simply had more previous interviews, and thus talking about the abuse was less upsetting for them.

For the sexually abused group, dissociation predicted children's negative affect. Specifically, sexually abused children who had more dissociative characteristics were more upset when discussing abuse. Previous studies indicate that highly dissociative children are at risk of developing chronic feelings of depersonalization and derealization (Putnam, 2000). It might have been expected that these characteristics would have led the maltreated children in the present study to appear emotionally stunted during the forensic interview (Bonnano et al., 2003). Yet, sexually abused children who had more dissociative characteristics seemed more upset. This finding is consistent with the argument that some sexually abused children may become upset at time of disclosure because they are forced, in effect, to confront these stressful events.

Clinicians rated the children's global adaptive functioning. The GAF measure provides an overall evaluation of children's mental health-related behavior. Children rated as better functioning expressed more emotion at disclosure. These children may be more in touch with their negative emotions or more aware of the implications of the maltreatment. Taken together with the present findings for dissociation, the results suggest that symptoms of certain forms of emotional problems are important predictors of emotional expressivity at disclosure.

Contrary to expectation, age and gender were unrelated to negative affect at disclosure. This might have been influenced by the fact that the number of children in certain age and/or gender groups did not afford sufficient statistical power. For example, in the sexually abuse group most of the children were 9 years or over (50%), and in the physically abuse group, there was a relatively small number of young children (13%). Further, in general there was a smaller number of males than females in all the abuse groups. Nevertheless, the (nonsignificant) trends for the mean negative affect ratings were relatively consistent with the stated hypotheses. Specifically, females tended to be somewhat more upset at disclosure than males, and older children tended to be more upset than younger children.

Our findings must be viewed in light of the limitations of the study. First, the sample was relatively homogenous ethnically, with 75% of the sample being African American, and all data were collected in one geographical area. Therefore, the results may not generalize across other ethnicities and locales. Second, we had a limited number of children in certain maltreated groups. Third, the possibility exists that some of the children had not in fact been maltreated; however, the results replicated in corroborated cases. Nevertheless, the leading nature of the interview might have influenced emotional expression. Fourth, because we had to rely on a composite measure of PTSD, we could not reliably separate intrusive, hyperarousal, and avoidance/numbness symptoms. A fifth issue, mentioned earlier, is that children who were repeatedly abused might have been repeatedly interviewed in the past. Sixth, interviewers' preinterview knowledge about the case could have affected their ratings, and the interviewers themselves were not trained to be reliable with each other in use of our negative affect scale. However, the fact that researchers, who were naïve to the preinterview allegations, reached high inter-rater reliability with the interviewers, and with each other, motivates greater confidence in the findings. Finally, co-occurrence of abuse types may have negatively affected our results. In future studies, researchers should consider larger and more diverse samples, coding for discrete emotions, assessing clusters of PTSD symptoms, relying on nonleading interviews, and carefully indexing number of previous interviews.

Nevertheless, our findings are important for understanding how children react emotionally when they disclose abuse in forensic interviews, and perhaps in clinical interviews as well. The results may also be relevant to court settings, when abused children are required to testify (but see Quas et al., 2005). Although it is expected that during their disclosures, child

victims will be highly distressed, cry, and show other negative emotional reactions, we found, as did Wood et al. (1996) previously, that children in forensic interviews often display neutral affect at disclosure, and most do not cry. Although the abused children's affect was often neutral, stronger negative reactions were linked to: fewer abuse experiences; global adaptive functioning; and for sexually abused children, dissociation.

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Child Dissociative Checklist (CDC)
Reference list of articles using the CDC
9-30-10

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