Non-verbal behavior of children who disclose or do not disclose child abuse in investigative interviews ☆

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ABSTRACT

Objective: The study focused on children's nonverbal behavior in investigative interviews exploring suspicions of child abuse. The key aims were to determine whether non-verbal behavior in the pre-substantive phases of the interview predicted whether or not children would disclose the alleged abuse later in the interview and to identify differences in the nonverbal behaviors of disclosing and non-disclosing children.

Method: We studied DVD-recorded interviews of 40 alleged victims of child abuse. In all cases, there was external evidence strongly suggesting that abuse had occurred. However, half of the children disclosed abuse when interviewed using the NICHD Investigative Interview Protocol, whereas the other half did not. Two raters, unaware whether or not the children disclosed, independently coded the videotapes for nonverbal indices of positive and negative emotions, stress, and physical disengagement in each 15-second unit of the introductory, rapport building, and substantive interview phases.

Results: Indicators of stress and physical disengagement increased as the interviews progressed while indices of positive emotions decreased. Non-disclosers showed proportionately more physical disengagement than disclosers in both the introductory and substantive phases.

Conclusions: Awareness of non-verbal behavior may help investigators identify reluctant children early in forensic interviews.

Practice implications: There is substantial evidence that, when questioned by investigators, many children do not disclose that they have been abused. The early detection of reluctance to disclose may allow interviewers to alter their behavior, helping the children overcome their reluctance by providing non-suggestive support before the possibility of abuse is discussed. Of course, nonverbal behavior alone should not be used to assess children in investigative interviews. However, nonverbal cues may nonetheless provide additional information to interviewers and assist them in identifying reluctant children.

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Many victims of child abuse are reluctant to divulge their experiences and may actively deny having been abused when directly asked (London, Bruck, & Wright, 2008). However, disclosure is often crucial for the initiation of child protective services, treatment, and criminal prosecution. To avoid false denials, interviewers may need to identify reluctant children as early as possible in investigative interviews and help them overcome their reluctance to talk. Previous research has demonstrated that non-disclosure by children who are known to have been abused can be predicted by examining children's reluctance (i.e., uncooperativeness) in the pre-substantive part of investigative interviews—before substantive issues are discussed (Hershkowitz, Orbach, Lamb, Sternberg, & Horowitz, 2006). However, that study focused exclusively on children's *verbal* behavior.

The overarching purpose of the present study was to examine the *nonverbal* behavior of disclosing and non-disclosing children who were being interviewed about their possible victimization. Specific goals were to: (1) determine whether children's nonverbal behavior in the pre-substantive phases of the interview predicted whether or not they would disclose, (2) investigate differences between the nonverbal behavior of disclosing and non-disclosing children, and (3) examine changes over the course of the interview in children's nonverbal behavior. To increase the validity of the study, we focused solely on children whose victimization had been substantiated by independent evidence.

Reviewing the research on children's disclosure, London, Bruck, Ceci, and Shuman (2005) concluded that more than a third (36%) of alleged victims fail to disclose sexual abuse when interviewed, even when there was clear evidence that abuse had occurred, although disclosure and non-disclosure rates varied considerably depending on the interview context and the way interviews were conducted. Other research on both physical and sexual abuse shows that preschoolers are more reluctant to disclose abuse than older children, that boys are more reluctant to disclose than girls, and that children who have already disclosed informally and those for whom there is strong corroborative evidence of abuse are more likely to disclose when formally interviewed (Hershkowitz, Horowitz, & Lamb, 2005; London et al., 2005).

Emphasizing the importance of standardized investigative interview practices, Hershkowitz et al. (2005) examined all child abuse investigations over a 5-year period in Israel, where forensic interviews must, by law, be conducted using the standardized NICHD Investigative Interview Protocol (see Lamb, Hershkowitz, Orbach, & Esplin, 2008 for a review). Consistent with London et al.'s conclusion, over a third of the children did not disclose suspected physical or sexual abuse. Although some suspicions are obviously unfounded, making non-disclosure appropriate, truly abused children are believed to conceal their victimization for a variety of reasons, including fear (Browne & Finkelhor, 1986; Farrell, 1988; Goodman-Brown, Edelstein, Goodman, Jones & Goodman, 2003), shame (Finkelhor, 1986; Furniss, 1991), guilt (Ney, Moore, McPhee, & Trought, 1986), or a desire to protect perpetrators (Sauzier, 1989; Summit, 1983), especially parents (Hershkowitz, Lamb, & Horowitz, 2007; Malloy, Lyon, & Quas, 2007).

Disclosure of abuse by victims is often a prerequisite for initiating legal intervention, however, and children who fail to disclose abuse risk continued victimization and denial of support and therapeutic interventions (Kelly & McKillop, 1996). Access to mental health services may be particularly important because child maltreatment is associated with a host of short and long-term adjustment problems, such as depression, dissociation, and post-traumatic stress disorder (Bonanno, Noll, Putnam, O'Neill, & Trickett, 2003; Cicchetti, 2010; Egeland, Sroufe, & Erickson, 1983; Egeland, Yates, Appleyard, & VanDulmen, 2002; Kendall-Tackett, Williams, & Finkelhor, 1993; Putnam & Trickett, 1997; Sternberg, Lamb, Guterman, & Abbott, 2006).

Because it is so important that children reveal their experiences, professionals have sought to develop supportive, yet non-suggestive, interviewing procedures so as to maximize valid disclosures of abuse (Lamb et al., 2008; Poole & Lamb, 1998). The NICHD Investigative Interview Protocol has been shown to improve the quality of interviewing and of the information provided by alleged victims (Lamb, Orbach, Hershkowitz, Horowitz, & Esplin, 2007; Pipe, Orbach, Lamb, & Cederborg, 2007), regardless of their age (Lamb et al., 2003; Orbach et al., 2000; Sternberg, Lamb, Orbach, Esplin, & Mitchell, 2001). Researchers have also investigated ways of identifying reluctant children as early as possible during forensic interviews. For example, Hershkowitz et al. (2006) examined differences in the dynamics of 100 investigative interviews conducted with disclosing and non-disclosing children. The children (4–13-year-olds) were interviewed using the NICHD Protocol. In all cases, there was strong independent evidence of abuse, yet half of the children denied having been abused when interviewed. The dynamics of interviews with disclosing and non-disclosing children differed significantly: Investigators interviewing non-disclosing children adhered less to best practice guidelines and compromised the rapport-building process by providing the children with less support and by using fewer open-ended free recall prompts in the pre-substantive phase. Of particular relevance to the present study, the children's cooperativeness in the pre-substantive part of the interviews predicted whether they made allegations in the substantive interview phase. This finding suggests that it might be possible to reliably identify reluctant children early in interviews, thereby allowing investigators to engage in more rapport building to decrease the children's reluctance before the possibility of abuse is discussed.

However, because Hershkowitz et al.'s study focused solely on verbal behavior, we do not know whether children's nonverbal behavior may similarly allow interviewers to detect reluctance. The present study was designed to address this issue, determining whether children's non-verbal behavior early in the interview predicted later disclosure. This may be particularly valuable because children's nonverbal behavior when describing abuse (e.g., facial displays of emotion, crying) is often used by professionals and jurors to judge children's perceived credibility (Golding-Meadow & Singer, 2003; Myers, Goodman, Redlich, & Prizmich, 1999; Regan & Baker, 1998): When children are upset, they tend to be perceived as more credible despite the evidence discussed below.

Many researchers have explored non-verbal behaviors associated with deceit in laboratory analogue studies, but findings have been mixed (Vrij, 2008; Vrij, Edward, Roberts, & Bull, 2000; Zuckerman, DePaulo, & Rosenthal, 1981). For example, whereas Porter et al. (Porter, Doucette, Woodworth, Earle, & MacNeil, 2008) observed more 'illustrators' (functional gestures supplementing what is said verbally) in liars than in truth tellers, the reverse was found in other studies (e.g., Vrij et al., 2000; Vrij & Mann, 2001). Similarly, hand and finger movements have been viewed by some researchers as indicators of truth-telling (e.g., Akehurst & Vrij, 1999) and by others as indicators of deception (Sporer & Schwandt, 2007). The absence of consistent nonverbal indicators of deceit may reflect the diverse ways that humans express mental states and regulate nonverbal cues, making it difficult to detect deceit nonverbally (Vrij, 2008). Not surprisingly, meta-analyses have revealed weak or no effects for most indicators tested (Bond & DePaulo, 2006; DePaulo et al., 2003; Sporer & Schwandt, 2007).

Most research on deception has involved adults, but when children have been examined in laboratory analogue studies, the conclusions have been similar. As with adults, nonverbal indicators rarely distinguished between deceptive and sincere children (Feldman, Devin-Sheehan, & Allen, 1978; Lewis, 1993; Talwar & Lee, 2002). Like adults, children seem to be aware of nonverbal cues (Talwar, Lee, Bala, & Lindsay, 2004) and able to control nonverbal cues quite effectively (e.g., Lewis, Stanger, & Sullivan, 1989; Talwar & Lee, 2002; Talwar, Murphy, & Lee, 2007). Even preschool children are sometimes able to conceal their lies regarding transgressions (e.g., Crossman & Lewis, 2006; Lewis et al., 1989; Talwar & Lee, 2002), but school-age children control their nonverbal behavior and mask deception with positive facial expressions (e.g., Feldman, Jenkins, & Popoola, 1979; Morency & Krauss, 1982) better than younger children do. These findings suggest that, as age increases, deception cues are likely to decrease, although both children and adults strive to conceal lies by inhibiting non-verbal behaviors (Stromwall, Hartwig, & Granhag, 2006).

Non-verbal indicators of reluctance to disclose documented histories of sexual abuse were examined by Bonanno and colleagues. Focusing on the facial expressions of 11- to 25-year-old females, the results of one study revealed that non-disclosers showed more expressions of shame in a free-recall session while disclosers showed more expressions of disgust (Bonanno, Keltner, & Noll, 2002). In a follow-up study, non-disclosers displayed more of the positive and negative emotional cues associated with "repressive coping" than disclosers (Bonanno et al., 2003).

In two studies, researchers examined children's nonverbal behavior in investigative interviews about suspected abuse. Wood, Orsak, Murphy, and Cross (1996) examined interviews conducted with 2- to 11-year-olds and coded the presence of the following nonverbal cues: emotions, attentiveness, and whether children were on or off task. As would be expected, older children were more "attentive/on task." Girls showed more sadness than boys but emotional displays were rare in this study. Sayfan, Mitchell, Goodman, Eisen, and Qin (2008) examined 3- to 16-year-olds' expressed emotions in investigative interviews by rating children's "negative affect" and "crying" on 6-point scales (from "very happy" to "very upset" and from "not crying" to "hysterically crying"). The children alleging sexual abuse were more upset than children alleging other types of abuse, but no significant age or gender differences emerged. Consistent with Wood et al.'s findings, most children were not rated as emotional, and their emotional expressions largely fell in the "neutral" category.

Although these studies are informative, they also raise questions that we hoped to address in the present study. First, all children in the studies by Wood et al. and Sayfan et al. disclosed abuse. Thus, it was not possible to determine whether nonverbal behavior in the pre substantive phase of the interview predicted disclosure, nor whether disclosing and non-disclosing children showed different nonverbal behaviors. Second, all children had been interviewed before the investigative interviews in which their nonverbal behavior was coded, and some of the investigative interviews were of questionable quality (e.g., described as "leading" by Sayfan et al., 2008). In this study, by contrast, we studied the first forensic interviews of the children, all conducted using the structured NICHD Protocol. Third, although Wood et al. reported that cases were "high risk" and Sayfan et al. conducted analyses on a subset of cases containing corroborative evidence, external evidence was not available for all cases. By contrast, external evidence strongly suggested that all children in the present study had been abused, whether or not they disclosed. Fourth, although Sayfan et al. provided ratings of "upset" at the beginning of the interview and at the time of disclosure, neither study systematically examined changes in nonverbal cues over the course of the interview.

Because children's *verbal* behavior in the pre-substantive interview phase predicts later disclosure of abuse, it is important to determine whether children's nonverbal behavior is similarly informative. In the current study, we took advantage of a unique opportunity to examine the nonverbal behavior of disclosing and non-disclosing children, for all of whom there was external evidence strongly suggesting that the children had indeed been abused. We examined: (1) differences between the nonverbal behaviors of disclosers and non-disclosers, (2) associations between nonverbal behavior early in the interviews and later disclosure/non-disclosure, and (3) changing patterns of nonverbal behavior across successive phases of the interviews.

First, we expected that negative nonverbal behaviors (i.e., signs of stress, physical disengagement, and negative emotions as defined below) would be more characteristic of non-disclosers than of disclosers in the pre-substantive interview phases and that their prominence would predict whether or not children disclosed in the substantive phases of the interview. Second, we expected that differences between disclosers and non-disclosers would be most marked in the substantive phase, when children might be expected to discuss abuse. Third, we hypothesized that abused children would display a variety of negative nonverbal behaviors and that these nonverbal behaviors would become increasingly prominent as the interviews progressed, while expressions of positive emotions would decrease as the interviews progressed, regardless of disclosure status.

Table 1
Characteristics of disclosers and non-disclosers.

	Disclosers	Non-disclosers
Mean age	8.9 years (SD = 2.7)	8.3 years (SD = 2.9)
Gender	75% male	50% male
Abuse type		
Physical	65%	65%
Sexual	35%	35%
Suspect identity		
Parent figure	60%	70%
Non-parent figure	40%	30%
Interview length	11.4 minutes (SD = 2.1)	13.2 minutes (SD = 4.0)

Method

Sample

Videotaped interviews of 40 alleged victims of child abuse (15 girls, 25 boys) ranging in age from 3.1 to 13.5 years (M = 8.6 years; SD = 2.8) were examined. Children were interviewed following suspicions of sexual abuse (n = 14) or physical abuse (n = 26). Suspected perpetrators were parent figures (n = 26) or non-parent figures (n = 14), including familiar adults and strangers. Half of these Israeli children disclosed abuse, and the other half denied abuse. In all cases, independent evidence suggested that abuse was very likely to have occurred. Independent evidence included:

1) Detailed suspect confessions to the police (n = 20). In these cases the police summaries of suspect interviews clearly identified the victims and included detailed descriptions of the abusive actions.
2) Independent statements by disinterested eyewitnesses to the police (n = 14). In these cases the eyewitnesses described the incidents of abuse in detail, clearly identifying the victims, the suspects, and core details of the abusive offences. Disinterested eyewitnesses included professionals (e.g., social workers, teachers, and psychologists and police officers) as well as other citizens.
3) Indicative medical evidence (n = 8). In these cases the medical evidence was documented by health care professionals from the health system and had to involve evidence clearly documenting abuse by way of semen traces or non-accidental bruises/fractures, for example.
4) In one case there was a video-recording of an abusive incident that clearly involved the child in the study, the suspect, and core aspects of the abuse.

In three cases, multiple types of corroborative evidence were available.

The sample was selected from an archive comprising interviews conducted all over Israel using as selection criteria the existence and documentation of corroborative external evidence, and the availability of a Digital video disc (DVD). Because fewer children failed to make allegations, we selected this group first and then sought matches from the larger group of cases in which children had made allegations when interviewed. The two groups were matched as closely as possible with respect to: the type of abuse (whether it was physical or sexual abuse), the suspect's identity (family member, familiar person, stranger); and the child's age (see Table 1).

Materials, measures and procedure

All interviews were conducted in Hebrew by 6 (1 male and 5 female) trained youth investigators (see Sternberg, Lamb, & Hershkowitz, 1996, for information about the Israeli system). All interviewers had similar professional background with first degrees in Social Work and at least 2 years' experience working in the Israeli Youth Investigative Service. All investigations were the first forensic interviews with the children, and were conducted using the NICHD Investigative Interview Protocol (Lamb et al., 2008; Orbach et al., 2000). The interviews were conducted in 2002 (n = 7), 2003 (n = 5), 2005 (n = 2), 2006 (n = 18), and 2007 (n = 8). The length of the interviews ranged from 5 min to 45 min, with an average of 12 min (M = 12.33, SD = 2.99).

The NICHD Investigative Interview Protocol. The NICHD Protocol divides the interview into two main parts – *pre-substantive* and *substantive*. In the beginning of the pre-substantive part, which contains two main phases, interviewers introduce themselves to the children and explain the purpose and ground rules of the interview (*introductory phase*). Interviewers then attempt to establish a supportive environment and build rapport. During this *rapport-building phase*, episodic memory retrieval strategies are rehearsed as open-ended prompts are used to explore neutral events experienced by the children (e.g. activities from the previous day, a recent birthday or other significant event).

Subsequently, interviewers proceed to the *substantive phase* by posing a series of open-ended invitations concerning potential abuse. If the children make allegations, interviewers attempt to elicit as much information as possible using free-recall open-ended invitations (e.g., "Tell me everything about that"). Only after interviewers exhaust open-ended

prompts and techniques to elicit information from children do interviewers progress to more focused prompts (Lamb et al., 2008).

DVD recorded investigative interviews. During the interviews, the video camera was focused on the children (head to legs fully visible in all but one case). The introductory, rapport building, and substantive interview phases were identified and marked by a native Hebrew speaker who was not involved in coding the interviews. The structured NICHD Protocol involves clear transitions between the interview phases, (e.g., "Today I would like to get to know you better" signals the transition to the rapport building phase) and so when inter-rater reliability regarding the demarcation of the phases was assessed on 25% of the DVDs, there was 100% agreement.

Coding. A coding scheme to measure nonverbal behaviors was developed specifically for the present study. To avoid the influence of para-verbal cues (e.g., pitch of voice), the sound was switched off during coding. Two non-Hebrew speaking coders who did not know whether the children disclosed or any other case characteristics (e.g., abuse type, suspect identity) coded the videos individually. The substantive phases were coded until children began to make allegations of abuse or until the interviewers terminated the phase and switched the focus to neutral topics. In each 15-second unit, the coders noted the presence or absence of nonverbal behaviors (described below) that were assumed to be indicators of stress, physical disengagement, and emotions (positive and negative).

Stress

(1) *Twitching* – abrupt, distinct movements of any part of the body.
(2) *Fidgeting* – use of one or both hands to touch or manipulate any body part or object.
(3) Pulling hair
(4) *Tapping* – repetitive thumping movements of the hands/fingers and/or feet.
(5) *Shifting position* – changes in the sitting position or shifts of the upper torso in any direction.
(6) *Biting/sucking/licking* – any behaviors in which the tongue was seen, a body part or object was grasped in the teeth, or the mouth deliberately touched a body part or object.
(7) *Rigidity/tensing up* – heightened muscle tension and the absence of physical movement.
(8) *Self-soothing movements* – deliberate and repetitive movements such as rocking or stroking.

Physical disengagement

(1) *Shrinking* – shortening or narrowing the body.
(2) *Closing off* – crossing arms and/or legs.
(3) *Looking away* – not looking at the interviewer for more than 4 seconds.
(4) *Covering* – hiding any part of the face or head.
(5) *Getting up* – completely or partially leaving the seat.
(6) *Turning away* – moving the child's entire upper torso away from the interviewer.

Emotions: facial displays of negative emotions

(1) *Anger*
(2) *Fear*
(3) *Sadness*
(4) *Shame*
(5) *Disgust*

Emotions: facial displays of positive emotions

(1) *Smiling/laughter*
(2) *Happiness*

Because shrinking, getting up, and turning away inevitably required children to also shift position, "shifting position" was not coded when any of these other behaviors was coded.

Inter-rater reliability

After being familiarized with the literature on nonverbal behavior and its interpretation, the researchers reviewed 8 DVDs of interviews with children who were not to be included in the study in order to draw up an inclusive list of behaviors that could be identified reliably. A coding manual was then developed and 2 coders applied it to 6 further DVDs in order to assess inter-coder reliability. Once they had attained levels of agreement in excess of 90%, the coders began working with the

Table 2
Proportion of time units including at least one indicator of the nonverbal indices: means and standard deviations.

Interviewer phase	Nonverbal indices		
	Positive emotions	Stress	Physical disengagement
Introductory			
Disclosers	.48 (.25)	.52 (.35)	.18 (.26)
Non-disclosers	.42 (.31)	.55 (.30)	.45 (.39)
Total	.45 (.28)	.54 (.32)	.33 (.36)
Rapport-building			
Disclosers	.31 (.28)	.62 (.30)	.53 (.23)
Non-disclosers	.32 (.27)	.75 (.26)	.64 (.26)
Total	.32 (.27)	.69 (.28)	.59 (.25)
Substantive			
Disclosers	.16 (.30)	.62 (.39)	.49 (.28)
Non-disclosers	.22 (.30)	.76 (.27)	.71 (.31)
Total	.19 (.30)	.69 (.34)	.61 (.31)
Overall			
Disclosers	.30 (.26)	.62 (.28)	.48 (.21)
Non-disclosers	.28 (.24)	.70 (.22)	.62 (.27)

target interviews. Reliability was re-checked 8 times by having one rater recode randomly selected DVDs previously coded by the other rater. Adequate inter-rater reliability was maintained (all Kappas > .80) and any disagreements were resolved by discussion.

Analyses

Most of the nonverbal behaviors were seldom observed, making it impossible to compare meaningfully the frequencies with which each occurred. Instead, composite scores for each of the 4 behavior categories (stress, physical disengagement, positive emotions, and negative emotions) were computed and analyzed. Composite scores reflected the proportion of time units during which at least 1 of the component behaviors was observed. Scores (see Table 2 for means and standard deviations) could thus range from 0 (none of the component behaviors observed in any 15-second time unit) to 1 (at least one of the component behaviors was observed in every 15-second time unit) and were computed for each of the three interview phases (Introductory, Rapport-Building, Substantive) and overall (across the entire interview). Negative emotions occurred very rarely ($M = .01$ across the entire interview) and thus were not analyzed. Analyses dealt first with group differences overall before examining differences in relation to phase of the interview.

Results

Preliminary analyses using *t* tests or correlations (as appropriate) revealed no significant differences between disclosers and non-disclosers with respect to the children's age, gender, abuse type, suspect identity, overall interview length, or length of the individual interview phases. Older children [$r(40) = -.35$; $p = .026$] and sexual abuse victims ($M = 77$, $SD = 23$) displayed proportionately more signs of stress than younger children and physical abuse victims [$M = 60$, $SD = 25$; $F(1, 38) = 4.26$, $p = .046$, $\eta^2 = .10$]. No other significant differences were found.

As shown in Table 1, nonverbal cues of stress were most common. A repeated measures ANOVA examining scores on the three nonverbal behavior dimensions (stress. physical disengagement, positive emotions) revealed a significant within-subjects effect, $F(2, 78) = 26.52$, $p < .011$, $\eta^2 = .41$. Follow-up simple effects analyses revealed that all means differed significantly from one another (stress $M = 66$, physical disengagement $M = 55$, positive emotion $M = .29$), $Fs(1, 39) \geq 5.52$, $ps \leq .024$, $\eta^2 = .12–.51$.

A key aim of the study was to determine whether nonverbal behavior in the pre-substantive parts of the interview predicted disclosure in the substantive phase. Interview phase (introductory, rapport-building and substantive phase-within subject factor) × allegation (discloser vs. non-discloser-between subject factor) mixed model ANOVAs examining stress, physical disengagement, and positive emotions separately were thus conducted to identify differences between disclosers and non-disclosers in the 3 phases of the interview.

There was a significant effect for allegation $F(1, 32) = 5.63$, $p = .024$, $\eta^2 = .15$ in the analyses of physical disengagement, with children in the non-disclosure group showing proportionately more physical disengagement ($M = .59$, $SD = .05$) than children in the disclosure group ($M = .40$, $SD = .06$). There was also a significant effect for phase $F(2, 31) = 19.00$, $p = .000$, $\eta^2 = .55$, with physical disengagement more prominent in the rapport-building phase ($M = .58$, $SD = .04$) and in the substantive phase ($M = .59$, $SD = .05$) than in the introduction ($M = .32$, $SD = .05$). There was no significant interaction between interview phase and group, but because we had predicted contrasting group differences at different stages of the interview, we compared group means for different phases using *t* tests. One showed [$t(33.31) = 2.35$, $p < .025$] more physical disengagement on the part of children in the non-disclosure group ($M = .46$, $SD = .07$) than of children in the disclosure group ($M = .18$, $SD = .08$) in

the introductory phase. Another t test [t (32) = 2.06, p < .047] showed more physical disengagement in the non-disclosure group (M = .70, SD = .31) than in the disclosure group (M = .49, SD = .28) in the substantive phase.

The analysis of stress revealed no significant effect for allegation but a significant effect for phase F (2, 31) = 4.53, p = .019, η^2 = .22 with more stress in the rapport building phase (M = .68, SD = .04) and in the substantive phase (M = .68, SD = .05) than in the introduction (M = .53, SD = .05). There was no interaction between interview phase and group.

The analysis of positive emotions revealed no significant effect for allegation but a significant effect for phase F (2, 31) = 11.69, p = .000, η^2 = .43 with positive emotions less prominent in the substantive phase (M = .19, SD = .05) than in the rapport building phase (M = .31, SD = .04) and less prominent in the rapport building phase than in the introductory phase (M = .45, SD = .04). There was no interaction between interview phase and group.

In sum, nonverbal cues of stress were most prominent, while positive emotions were least common. The prominence of all three nonverbal behaviors changed over the course of the interview, with both stress and physical disengagement becoming more and positive emotions becoming less prominent. There were differences between the groups with respect to physical disengagement, with children in the non-disclosure group more disengaged physically than children in the disclosure group in both the introductory and substantive phases of the interview.

Discussion

This study of children's nonverbal behavior during investigative interviews about suspected abuse of which there was independent corroboration provided important insights into the informativeness of children's nonverbal behavior. As expected, negative nonverbal behaviors (stress and physical disengagement) became increasingly prominent as the interviews progressed, while the display of positive emotions decreased. During the pre-substantive part of the interview (specifically, the introductory phase), physical disengagement was more prevalent among non-disclosers than disclosers. Importantly, and as predicted, this difference in the nonverbal behavior of non-disclosers and disclosers predicted whether or not the children made allegations of abuse in the substantive phase of the interviews. In the substantive phase, non-disclosers were again more physically disengaged than their disclosing counterparts. Although we expected comparable differences between disclosers and non-disclosers in stress and emotionality, these differences were not evident.

Differences in the non-verbal behavior of disclosers and non-disclosers were also reported by Bonanno et al. (2003) but our findings extend theirs by showing that these differences in reluctance are characterized by physical disengagement. They also extend Hershkowitz et al.'s (2006) findings, showing that the verbal disengagement they identified as a correlate of non-disclosure is paralleled by nonverbal disengagement. Interestingly, indices of physical disengagement at the very beginning of the interviews (i.e., during the introductory phase) predicted whether children would disclose later in the interviews, whereas the discriminating verbal cues identified by Hershkowitz et al. only became predictive in the later rapport-building phase. Thus, observing nonverbal signs of physical disengagement may help investigators detect potentially reluctant children even earlier in the interviews, perhaps allowing them to adopt strategies to reduce their reluctance.

Although nonverbal indicators of stress (discussed below) may reflect generalized mental states, physical disengagement may reflect the children's feelings about the interviewers more directly. Interestingly, increasing physical disengagement was evident in both groups, perhaps indicating how taxing the interviews were for the children. Two-thirds of the children had been abused by their own parents, rendering disclosure especially problematic (Hershkowitz et al., 2005; London et al., 2008).

In general, stress was more commonly observed than the other nonverbal behaviors, perhaps because children expected early on that the interviewers wanted to explore experiences of abuse. However, the fact that nonverbal signs of stress increased as the interviews progressed suggests that the process itself was stressful for the children. Contrary to our hypotheses, stress was not more characteristic of non-disclosers than disclosers, perhaps because a ceiling effect prevented stress from discriminating between the two groups. Specifically, as Table 2 showed, half of the time units in the introductory phase and over two-thirds of the time units in the rapport-building phase involved nonverbal displays of stress, regardless of group.

It is not clear why children who had allegedly experienced sexual abuse appeared more stressed than children who had allegedly experienced physical abuse. However, this finding is consistent with Sayfan et al. (2008)'s finding that children alleging sexual abuse were more "upset" during investigative interviews than children alleging other types of abuse. Perhaps sexual abuse itself is more stressful (Maikovich, Koenen, & Jaffee, 2009; Marks, Lamb, & Tzioumi, 2009; Vyssoki & Schuermann-Emanuely, 2008; Werner & Werner, 2008) or more difficult to discuss in investigative settings than other types of abuse (Alaggia, 2004; Keary & Fitzpatrick, 1994; Lippert, Cross, & Jones, 2009; London et al., 2008).

Age was also associated with the nonverbal expression of stress, with stress less prevalent among older than younger children. This finding is consistent with other research suggesting that children develop better control over nonverbal channels as their muscular control increases (Ekman, Roper, & Hager, 1980; Feldman & Phillipot, 1993; Kieras, Tobin, Braziano, & Rothbart, 2005; Saarni, 1984) and as they learn to mask nonverbal cues (Feldman et al., 1979; Morency & Krauss, 1982; Talwar & Lee, 2002; Talwar, Murphy, & Lee, 2007).

The facial expressions one might expect to characterize abused children, especially those reluctant to disclose their experiences, were not evident, perhaps because facial expressions are more controllable than body movements (Ekman & Friesen, 1969), or because the video recordings were insufficiently detailed to capture and code subtle facial expressions rather than larger body movements. Because nonverbal expressions of emotions, especially negative emotions, are displayed

in micro facial expressions, the coding of emotions may have been compromised in this study. However, other researchers have similarly found that negative emotions are rarely expressed by children disclosing abuse (Sayfan et al., 2008; Wood et al., 1996). Thus the children studied by Sayfan et al. were largely rated as having neutral expressions, while those studied by Wood et al. were relaxed or neutral. These findings, like our own, underscore that children being interviewed about abuse do not behave as adults expect and this may have important implications for perceptions of children's credibility (e.g., Golding-Meadow & Singer, 2003; Myers et al., 1999; Regan & Baker, 1998).

Our study was the first to examine disclosing and non-disclosing children's nonverbal behavior in a forensic context and some methodological limitations must be recognized. Firstly, because prior research has not identified nonverbal cues associated with abuse disclosure, indices were created on a conceptual basis. Secondly, the fact that most of the targeted behaviors appeared rarely meant that they could not be examined individually. Thirdly, the predictive value of nonverbal behavior was limited, suggesting that the informativeness of early physical disengagement was much less than we had hoped, while other dimensions of nonverbal behavior had no predictive value.

These limitations notwithstanding, we found that signs of physical disengagement early in investigative interviews were associated with later disclosure/non-disclosure. In the field, these nonverbal signs of disengagement may permit the early detection of reluctance to engage, signalling to interviewers that they need to delay the discussion of substantive issues until rapport has been established conclusively. Of course, nonverbal behavior alone should not be used to assess children in investigative interviews. However, nonverbal cues may nonetheless provide additional information to interviewers and assist them in identifying reluctant children.

Acknowledgments

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