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The Influence of Multiple Interviews on the Verbal Markers of Children's Deception

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This study investigated different verbal expressive markers of children recounting both true and false events. Seventy-eight children (M age = 7.58 years) interacted with a research assistant on 3 consecutive days. All children played a game that included a touching component in which the research assistant placed stickers on the child's body. Parents were then asked to coach their children to lie during subsequent interviews occurring 1 week later. Children were interviewed over 3 consecutive days. Results indicated that verbal expressive markers (e.g., cognitive operations, spontaneous corrections, admissions of lack of knowledge, temporal markers) of true and intentionally false reports were different in the first interview. However, these differences disappeared over subsequent interviews. Results of the current study highlight the importance of recording the first interview in which children disclose, particularly when using verbal markers as indicators of deception.

Keywords: deception detection, child witnesses, verbal markers

Credibility and reliability of child witnesses are of major concern in the criminal justice system (London & Nunez, 2002; Talwar, Lee, Bala, & Lindsay, 2004, 2006). Research has demonstrated that children make credible witnesses when truthfully recalling an event (e.g., Koriat, Goldsmith, Schneider, & Nakash-Dura, 2001; Ornstein, Gordon, & Larus, 1992; Quas, Goodman, Ghetti, & Redlich, 2000). However, other studies have indicated that children can be coached into telling convincing fabricated accounts of events (e.g., Lyon, Malloy, Quas, & Talwar, 2008; Orcutt, Goodman, Tobey, Batterman-Faunce, & Thomas, 2001; Talwar et al., 2004). Given the difficulties that people face in determining the veracity of children's statements and the number of interviews children face, it is important to investigate the presence of differences in language usage and consistency across multiple interviews.

Children's Lie-Telling Behaviors

Historically, adults believed that very young children were poor lie-tellers (Yang et al., 2005). Yet, more recent studies have

revealed that as young as 3 years of age, children engage in deceptive behaviors, such as keeping secrets or lying to protect themselves from getting into trouble, leading to a reconceptualization of child development theories related to lying (Lewis, Stanger, & Sullivan, 1989; Polak & Harris, 1999; Tye, Amato, Honts, Devitt, & Peters, 1999). Between the ages of 6 and 10 years old, the ability to elaborate on lies and maintain consistency across statements improves (Talwar, Gordon, & Lee, 2007). Children's true and intentionally false reports increase in length, complexity, and descriptive detail with age (Craig, Sheibe, Raskin, Kircher, & Dodd, 1999; Pipe, Lamb, Orbach, & Esplin, 2004; Vrij, 2005), suggesting that older children's lies may be more difficult to identify. Nevertheless, a significant body of research indicates that when adults attempt to detect children's intentionally false reports, they do so at rates rarely above chance (Saykaly et al., 2012; Strömwall, Bengtsson, Leander, & Granhag, 2004; Strömwall, Granhag, & Landstrom, 2007; Talwar et al., 2006).

Verbal Markers of Deception

Previous research has found that there are a number of verbal expressive markers associated with deception. For instance, research with adults has found that intentionally false reports tend to contain fewer first-person pronouns, fewer exclusive terms (e.g., *except*, *without*), more simple verbs (such as motion terms and spatial terms), and more negative emotional words (Bond & Lee, 2005; Newman, Pennebaker, Berry, & Richards, 2003). Other researchers have postulated that true reports will have more perceptual details (smell, taste, touch, as well as auditory and visual detail), more contextual information (spatial and temporal detail), and more affective information than intentionally false reports (Strömwall & Granhag, 2005; Vrij, Akehurst, Soukara, & Bull,

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2004). Conversely, intentionally false reports have more cognitive operations and appear to be more scripted (see Vrij, 2005). Vrij et al. (2004) found that both children and adults have more cognitive operations when describing a fabricated real-life event (rather than something they had witnessed or observed).

Multiple Interviews on Children's Veracity

Children involved in the justice system often are questioned across numerous interviews by a variety of professionals, such as social workers, police, and lawyers. By the time children testify in court, they are likely to have been interviewed about the events in question several times (La Rooy, Katz, Malloy, & Lamb, 2010). Children's ability to maintain true reports may be influenced by the type of questions. Researchers have found that children are more accurate when asked open-ended questions as opposed to close-ended questions. This effect is exacerbated when misleading or specific questions are repeated within or across interviews (Bruck & Ceci, 1999; Poole & White, 1991).

There has been little examination of children's ability to maintain their intentionally false reports over multiple interviews. Research on the effects of multiple interviews with children has yielded mixed results. For instance, some researchers have found evidence to suggest that repeated interviews increase the production of accurate information (Gilbert & Fisher, 2006; La Rooy et al., 2010; La Rooy, Pipe, & Murray, 2005). Repeated interviews may also facilitate recall of details and reduce the amount of detail the children forget to supply, all of which would be missed had children been interviewed only once (Goodman, Bottoms, Schwartz-Kenney, & Rudy, 1991; La Rooy et al., 2005, 2010). In contrast, other studies have suggested that repeated interviews may be detrimental to recall, given that children are highly susceptible to suggestion (Bruck, Ceci, & Hembrooke, 2002; Pipe & Wilson, 1994). In a study by Quas and Schaaf (2002), children were consistent in reporting information during two interviews; however, this consistency decreased in a third interview. Quas and Schaaf hypothesized that perhaps children were tired of contesting the false or suggestive statements of the interviewer, and as such, the children responded in a way that would appease the interviewer. Although there are reports investigating the utility and benefits of multiple interviews with children (see La Rooy, Lamb, & Pipe, 2009, for a review), there is little in the literature about the influence of multiple interviews on intentionally false statements.

Only one study to date has examined children's true and false reports over multiple interviews (Bruck et al., 2002). In this study, children told both true reports (about a staged event) and false reports (based on fictional accounts told to the child in suggestive interviews). Children were then interviewed a total of five times across 6 weeks and their reports were analyzed for verbal expressive markers of deception (e.g., spontaneous corrections, contradictions, temporal markers, elaboration, and improbable details). The researchers found that false reports contained more details, temporal markers, and elaboration than true reports. Over repeated interviews, children added more new information across subsequent interviews for false stories than true ones. Children were also more likely to repeat the same details in true rather than false reports. Bruck et al. (2002) suggested that this finding supported the "Pinocchio" hypothesis, which predicts that the more false stories are recounted, the more they grow or become elaborated.

Granhag, Strömwall, and Jonsson (2003) postulated differences between liars who are giving intentionally fabricated reports and truth-tellers who are recalling an event that actually happened: the repeat versus reconstruct hypothesis. This hypothesis states that liars are motivated to appear to be consistent and display little doubt toward their own accounts. As a result, liars try to repeat their accounts exactly, whereas truth-tellers try to reconstruct the actual event from memory. Although this theory has been applied to adult lies, these researchers theorized that this hypothesis may also be applicable to children. Child truth-tellers should have more omissions across interviews as their memory begins to fade, as well as more new details as they remember details they had previously forgotten. Conversely, child lie-tellers should have fewer new details and more repeated details as they attempt to remain as consistent as possible across interviews.

To test this hypothesis, Strömwall and Granhag (2005) examined children's true and intentionally fabricated reports over two interviews. In this study, children either truthfully reported about a magic show they had witnessed or fabricated a story about a magic show they never saw. Contrary to the findings of Bruck et al. (2002) but consistent with the repeat versus reconstruct hypothesis, children in the fabricated condition had more repeated details, fewer omissions of previous details, and fewer new details. These results suggest that there may be differences in the consistency of children's true and intentionally fabricated statements over multiple interviews.

Repeated Events

In some cases of neglect or abuse, children are not only subjected to multiple interviews about their maltreatment, but are also likely to be reporting an event that has occurred several times. Despite this, most research has focused on children's ability to recall one event (Poole & White, 1991; Quas, Malloy, Melinder, Goodman, & D'Mello, 2007). Investigating children's reports of a repeated event over extensive and multiple interviews would increase the generalizability of findings for such cases. The consistency of statements when reporting about multiple—yet similar—events addresses both the influence of multiple interviews and multiple repetitions of events on children's ability to accurately recount those events. Of the few studies that have investigated children's ability to recall true repeated events, results have been inconsistent (e.g., Connolly & Lindsay, 2001; Goodman & Quas, 2008; Powell & Roberts, 2002; Powell & Thomson, 1996). Some researchers have found that children recalling true repeated events have more difficulty reporting specific details and are often inconsistent compared with reporting about a single event (Powell & Thomson, 1996). That is, children have trouble reporting specific details about a specific time the event occurred; however, they are more accurate when describing the events generally than children who experienced the event a single time. In contrast, other studies have reported greater deviation in detail when children are describing a single occasion rather than a series of events (Connolly & Price, 2006; Price, Connolly, & Gordon, 2006). Nevertheless, it appears that children as young as 7 years of age are able to regulate their memory while reporting past events in order to produce an accurate account of what happened (Koriat et al., 2001), indicating that children's ability to recall from memory is not as poor as was once suspected. However, it is unclear how children's intentionally

false reports about repeated events may be similar or different from their true reports of repeated events.

The Current Study

The goal of the present study was to investigate children's abilities to maintain true and intentionally false reports of a repeated event over repeated interviews. Verbal expressive markers of deception could be used to potentially reduce the intuitive guessing of professionals in the legal, forensic, and social services who must assess the veracity of children's statements when disclosing about abuse, neglect, or other transgressions of an adult. Thus, investigating verbal expressive markers of deception may provide a better understanding of children's reports about repeated victimization.

The impact of multiple interviews about true and fabricated accounts of repeated events was examined. Children between the ages of 4 and 11 years engaged in a game over three sessions with a researcher. The game involved a touching component. Children were coached to truthfully report the game they had played and to falsely claim that they had played another game with the researcher. Unlike previous studies in which children were asked to recount true and fabricated events they had witnessed, children in the current study were asked to recount true and fabricated (coached) false events in which they were active participants. As such, children recounted an interaction, as well as created stories about an interaction in which the child and researchers were active participants. Children were then interviewed about what had occurred during the play session over three interviews. Children's reports were transcribed and analyzed to determine whether true and intentionally false reports could be differentiated on the basis of verbal expressive markers. Based on previous findings (e.g., Bruck et al., 2002; Strömwall & Granhag, 2005; Vrij et al., 2004), we hypothesized that truthful accounts would have a higher word count, greater use of self-corrections, more self-references, and greater admissions of lack of knowledge, as well as more spatial, perceptual, and affective information than intentional false reports. Intentional false reports were expected to contain more temporal markers and more cognitive operations than truthful accounts.

Another objective of the present study was to examine the consistency in children's true and intentionally false reports across repeated interviews. Consistency is a criterion used in the justice system to evaluate the credibility of children's allegations of abuse (Conte, Sorenson, Fogarty, & Rosa, 1991). For instance, inconsistent reports can reduce mock jurors' ratings of children's credibility (Leippe, Manion, & Romanczyk, 1992; Ross, Dunning, Toglia, & Ceci, 1990). On the basis of the repeat versus reconstruct hypothesis (Granhag et al., 2003), intentionally false stories were expected to be more consistent across interviews than true stories and have fewer new details (Quas, Davis, Goodman, & Myers, 2007). Therefore, across subsequent interviews, children's true reports were expected to display more contradictions, omissions of information, and additions (new information), leading them to appear less consistent than intentionally false narratives. It should be noted that our predictions were based on single-event studies. There may be a different pattern when reporting repeated events. However, as there were no previous studies examining children's intentionally fabricated reports of multiple events, we could not predict the direction of these effects.

Although preschoolers are capable of lying (Chandler, Fritz, & Hala, 1989; Lewis et al., 1989; Talwar & Lee, 2002a, 2002b, 2008), the ability to maintain deception in a convincing manner increases with age. Therefore, younger children's lies tend to be more easily detected. Using the analysis of verbal expressive behavior, we hypothesized that younger children (vs. older children) would have the largest difference between their true and intentionally false reports in terms of verbal cues. Furthermore, we hypothesized that younger children would have more difficulty in maintaining consistency across interviews of their intentionally false reports. Finally, as previous research has found that there are gender differences in children's recall (Davis, 1999), we also examined whether there were any differences in girls' and boys' true and intentionally false reports.

Method

Participants

Participants were 78 children ($n = 38$ girls) from a database of previous participants, ranging in age from 4 to 11 years (M age = 7.58 years, $SD = 0.45$). All participants were English speaking. The participants were further divided into four age groups: 4- and 5-year-olds ($n = 19$, eight girls; M age = 4.58 years, $SD = 0.51$), 6- and 7-year-olds ($n = 20$, nine girls; M age = 6.55 years, $SD = 0.51$), 8- and 9-year-olds ($n = 20$, 11 girls; M age = 8.65 years, $SD = 0.49$), and 10- and 11-year-olds ($n = 19$, 10 girls; M age = 10.55 years, $SD = 0.27$).

Procedure

Children engaged in three play sessions with a research assistant (RA1) over consecutive days. Children and RA1 played the same game on each of the 3 days, and RA1 attempted to replicate the events of the interactions to make them the same across the 3 days. As such, with the exception of some minor details (e.g., the clothing the children were wearing or the sticker chosen by the child), the interactions were the same across the three play sessions. Participants were randomly assigned to one of three games: (a) the doctor game, in which children had to correctly identify and remove small body parts (e.g., heart, lungs) from a game board; (b) a guessing game, in which children had to guess the identity of an object on a card using yes-no questions; and (c) a memory game, in which children had to locate pairs of cards. For all games, after each successful trial, children received a sticker that was placed on their body (arm, hand, foot, knee, or cheek) by RA1. Each interaction lasted approximately 15 min.

At the end of the third visit, RA1 left documents with the children's parents explaining the game their child had played with RA1. Parents were instructed that a second research assistant (RA2) would visit their home three times in the following week to interview their child about what they had done with RA1. In preparation for these interviews, parents were instructed to coach their child to lie to RA2. Specifically, parents coached their children to report they had played two games with RA1. The children were to (a) truthfully report the game that they had actually played with RA1 (true report) and (b) incorrectly report playing a second game they had never played with RA1 (intentionally false report). The intentionally false game was always one of the alternative

game options not played with RA1. For example, if the child played the doctor game with RA1, he or she was instructed to fabricate a story about either the memory game or the guessing game. Parents were instructed to spend 15 min before each interview coaching their child to report both the true report and false report. Children were coached to “try to trick the interviewer” to make the interviewer believe the child played both games. To assess whether parents had coached the child as instructed, we asked parents after each interview how long and what they did when they coached the child. All parents reported complying with the instructions by coaching for an appropriate length of time. All parents said they had not played the “false” game with the child. Parents reported coaching the child by verbally describing the game or reading the description as given to them by RA1 and using a method of question and answer to rehearse. Parents were also asked how well they thought their child had learned the intentionally false report on a scale of 1 (*not at all*) to 5 (*very well*). Parents reported that overall their child had learned the false game fairly well ($M = 4.2$, $SD = 1.01$). There were no differences in the parental ratings as a function of age of child.

After approximately 1 week, RA2 interviewed the children. Children were asked to describe the events occurring with RA1. In line with research that has found that the most reliable information is obtained when interviewers use open prompts (Goodman, Hirschman, Hepps, & Rudy, 1991; Lamb, Hershkowitz, Orbach, & Esplin, 2008; Orbach & Lamb, 2001), interviews included an initial prompt (e.g., “Did RA1 visit you last week?”) and subsequent open-ended prompts (“I was told you played two games with RA1 last week. Can you tell me everything you did with RA1?” “What else happened?” “Tell me more about that.” “Did anything else happen?”). The questions were broad in nature, asking about the interactions in general and not about specifics that may have differentiated the play sessions from one another. Children were interviewed three times over 3 consecutive days by the same person. Interviews were approximately 20 min in length. Children were told they would be interviewed three times to see whether

they could recall and describe the events more than once. All children reported that they played two games. RA2 was blind to the game the child had actually played. The sessions were recorded and transcribed for further analysis. The design of the study was a 4 (age: 4–5, 6–7, 8–9, 10–11) \times 2 (sex) \times 2 (veracity: truth vs. lie) \times 3 (interview: 1, 2, 3) analysis of variance (ANOVA), with veracity and interview as within-subject factors.

Coding

Verbal markers. All interviews were transcribed and cross-checked twice by two individuals to ensure accuracy. Each story was transcribed verbatim and included both participant and interviewer statements. The transcripts were then coded by two independent coders who were blind to the hypotheses of the study and what games children played. Children’s verbal statements were coded for word count, cognitive operations, affective terms, perceptual information, spatial information, self-references, spontaneous corrections, temporal markers, unusual details, admitted lack of knowledge, and reproductions of dialog (see Table 1 for a description and example of codes). Six different reports (3 days, each including one true and one intentionally false report) were analyzed. Both coders coded 25% of the interviews to ensure consistency and agreement of ratings. The result of the interrater analysis was $\kappa = 0.85$, $p < .01$.

Consistency in details across interviews. To determine the consistency of reports across interviews, coders coded for repeated details across each pair of interviews (details mentioned in the first interview that were repeated in later interviews), new details (details mentioned in later interviews not mentioned in a previous interview), omitted details (details mentioned in an earlier interview not mentioned in a later interview), and contradictory statements (details that contradicted details in the earlier interview). Using a modified methodology developed by Strömwall and Granhag (2005), we counted details based on statements. For example, if the child stated that “there was a fork, and a board, and some

Table 1
Codes and Descriptions of Verbal Expressive Behaviors

Expressive marker	Code description	Example
Cognitive operations	Words referring to a cognitive process, e.g., <i>know, remember, think</i>	“I think we played it three times.” “I remember she said yes.”
Self-references	When child refers to self, e.g., <i>I, me, we, our</i>	“We played the picture game.”
Spontaneous corrections	When the child states, implicitly or explicitly, that he/she made an error	“She gave me two, no three stickers.”
Temporal markers	Words denoting order, e.g., <i>first, then, after that</i>	“She placed a sticker on me, then we played the next game.”
Lack of knowledge	Child admits he/she is unsure/unaware of correct response	“I don’t know.” “I can’t remember.”
Perceptual information	Details with regards to sight, smell, sound	“It smelled like cookies because mom was baking.”
Spatial information	Orientation of the room	“RA was sitting next to the coffee table.”
Affective terms	Terms of affection, e.g., <i>love, desire, care for</i>	“I loved working with the RA.”
Reproduction of dialogue	Dialogue replicated from a previous conversation	“RA said, ‘Put the sticker on your cheek,’ so I did.”
Unusual details	Random, unrelated information to the content of the message	“The RA had purple hair.”

body parts," this statement was counted as three details: the fork, the board, and the body parts. To control for units of information (which ranged from 10 units to 25 units), we calculated proportion scores for all four categories. The result of the interrater analysis was $\kappa = 0.89, p < .01$. Children's statements were coded by interview (Interview 1, Interview 2, Interview 3) and by story (true, intentionally false). Therefore, six different consistency scores were calculated: the difference between Interview 1 and Interview 2 for both the true and intentionally false story, the difference between Interview 1 and Interview 3 for both the true and intentionally false story, and the difference between Interview 2 and Interview 3 for both the true and intentionally false story. Therefore, if a child provided information in Interview 1 but not in Interview 2, this unit of detail was coded as an omission. However, if the child provided the detail in Interview 3, this was scored as consistent between Interview 1 and Interview 3 but a new detail in comparison to Interview 2.

Results

Preliminary analysis revealed no significant gender differences for any variables. Thus, the data of both genders were combined for the subsequent analyses. In line with the previous literature (Newman et al., 2003; Talwar & Lee, 2002a), categories coded with low frequencies (less than 20% of the time) were excluded. In total, six variables were included in subsequent analyses: verbosity, cognitive operations, spontaneous corrections, admissions of lack of knowledge, temporal markers, and self-references (see Table 2). For each verbal marker, a 2 (veracity: truth, lie) \times 3 (interview: 1, 2, 3), \times 4 (age: 4–5, 6–7, 8–9, 10–11) ANOVA was performed, with veracity and interview as within-subject factors.

Verbosity

Word count was calculated for participants' answers in regards to their explanation of the games. Fillers such as *umm* and *ahh* were not included in the count. The result of the interrater analysis was $\kappa = 1.00, p < .01$. Verbosity was similar in both the true ($M = 55.72, SD = 31.42$) and intentionally false reports ($M = 54.80, SD = 32.89$) across all three interviews (no significant main effect or interaction). Furthermore, verbosity did not

significantly differ across interview: Interview 1, $M = 57.96, SD = 33.09, 95\% CI [48.52, 61.42]$; Interview 2, $M = 56.88, SD = 33.60, 95\% CI [49.96, 63.12]$; and Interview 3, $M = 54.42, SD = 28.60, 95\% CI [48.98, 60.51]$.

Cognitive Operations

Cognitive operations were coded as any statement that displayed cognitive reasoning. The result of the interrater analysis was $\kappa = 0.71, p < .01$. The ANOVA revealed a main effect of interview, $F(2, 73) = 3.42, p = .04, \text{partial } \eta^2 = .10$. There were significantly more cognitive operations used in Interview 1 ($M = 0.93, SD = 0.10, 95\% CI [0.74, 1.12]$) than in Interview 2 ($M = 0.70, SD = 0.09, 95\% CI [0.51, 0.87]$) or Interview 3 ($M = 0.68, SD = 0.09, 95\% CI [0.50, 0.90]$).

Spontaneous Corrections

A spontaneous correction was coded as any unprovoked correction within the child's statement (e.g., "I received three stickers; no, I received four stickers"). The result of the interrater analysis was $\kappa = 0.83, p < .01$. The ANOVA yielded a significant Interview \times Veracity interaction, $F(2, 73) = 3.13, p = .05, \text{partial } \eta^2 = .08$. In Interview 1, participants used more self-corrections in their true reports than they did during their intentionally false reports, $t(77) = 2.06, p = .04, 95\% CI [-0.073, 0.43]$ (see Table 3). However, there were no significant differences between true and intentionally false reports in Interview 2, $t(77) = 0.16, p = .90, 95\% CI [-0.20, 0.23]$, or Interview 3, $t(77) = -1.25, p = .37, 95\% CI [-0.29, 0.11]$, respectively.

Lack of Knowledge

Admitting lack of knowledge was coded as any admission by the child that he or she did not remember or did not know. The result of the interrater analysis was $\kappa = 0.93, p < .01$. The ANOVA yielded a significant main effect of age, $F(3, 74) = 3.16, p = .03, \text{partial } \eta^2 = .16$, in which younger participants (ages 4–7 years) admitted to lack of knowledge significantly more often than older children (ages 8–11 years). An Interview \times Veracity interaction, $F(3, 74) = 2.56, p = .02, \text{partial } \eta^2 = .18$, indicates that participants in Interview 1 were more likely to admit lack of knowledge during their intentionally false reports than they did during their true reports, $t(77) = -0.24, p = .05, 95\% CI [-0.58, 0.10]$ (see Table 3). However, there were no significant differences between true and intentionally false reports in Interviews 2 and 3, $t(77) = -0.10, p = .44, 95\% CI [-0.27, 0.12]$, and $t(77) = -0.17, p = .13, 95\% CI [-0.35, 0.05]$, respectively.

Temporal Markers

The result of the interrater analysis was $\kappa = 0.84, p < .01$. Examination of temporal markers yielded a significant Interview \times Veracity interaction, $F(1, 74) = 3.63, p = .03, \text{partial } \eta^2 = .10$ (see Table 3). In Interview 1, participants used more temporal markers in their intentionally false reports than they did during their true reports, $t(77) = 0.63, p = .04, 95\% CI [-1.23, -0.04]$. However, there were no significant differences between true and intentionally false reports in Interview 2 and Interview 3,

Table 2
Frequency of Verbal Expressive Behaviors for True and Fabricated Narratives

Behavior	True		Fabricated	
	M	SD	M	SD
Verbosity	55.72	31.42	54.80	32.89
Cognitive operations	0.73	0.13	0.81	0.12
Self-references	7.61	5.06	7.10	4.87
Spontaneous corrections	0.51	0.11	0.46	0.88
Temporal markers	1.94	0.21	2.08	0.27
Lack of knowledge	0.55	1.07	0.72	1.15
Perceptual information	0.04	0.17	0.02	0.13
Spatial information	0.02	0.13	0.02	0.13
Affective terms	0.18	0.78	0.09	0.43
Reproduction of dialog	0.02	0.13	0.00	0.00
Unusual details	0.08	0.54	0.04	0.13

Table 3
Interview by Veracity Interactions of Verbal Markers of Deception

Marker	Interview 1		Interview 2		Interview 3	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Spontaneous corrections						
True condition	0.76	0.13	0.47	0.09	0.43	0.08
Fabricated condition	0.42	0.88	0.46	0.95	0.51	0.80
Lack of knowledge						
True condition	0.65	1.16	0.49	0.81	0.49	1.07
Fabricated condition	0.90	1.06	0.60	0.96	0.65	1.44
Temporal markers						
True condition	2.02	0.19	1.97	0.26	1.80	0.20
Fabricated condition	2.66	0.34	2.02	0.23	1.66	0.22

$t(77) = 0.06, p = .66, 95\% \text{ CI} [-0.70, 0.45]$, and $t(77) = -0.24, p = .52, 95\% \text{ CI} [-0.35, 0.68]$, respectively.

Self-References

Self-references were coded as any statement in which the participant referred to him or herself. Statements including *I, my, our,* and *we* were coded as self-references. The result of the interrater analysis was $\kappa = 0.80, p < .01$. The ANOVA yielded a significant main effect of age, $F(3, 74) = 3.10, p = .03$, partial $\eta^2 = .10$, where 4- to 5-year-olds used significantly fewer self-references ($M = 4.94, SD = 0.978$) than all other age groups (6–7: $M = 7.14, SD = 0.91$; 8–9: $M = 9.72, SD = 1.06$; 10–11: $M = 8.75, SD = 1.16$).

As ANOVAs revealed significant verbal marker differences between true and false reports, a stepwise discriminant analysis using the Wilks's lambda method was conducted to determine whether the verbal markers could predict the veracity of children's statements for each interview. Five dependent variables were entered into the analysis: cognitive operations, temporal markers, self-references, admitting lack of knowledge, and spontaneous corrections. The overall Wilks's lambda for children's first interview was significant, Wilks's $\Lambda = 0.95, \chi^2(1, N = 76) = 4.14, p = .04$, indicating that children's true and false stories were successfully differentiated above chance levels. The correct classification rate for lie statements was 53.80%; for true statements, it was 61.50%. The beta coefficient for cognitive operations ($\beta = .95$) was statistically significant, with more cognitive operations significantly predicting that the story was false, $F(1, 76) = 4.28, p = .04$. All other coefficients were nonsignificant.

The overall Wilks's lambda for children's second interview was not significant, Wilks's $\Lambda = 0.99, \chi^2(1, N = 76) = 0.84, p = .21$, indicating that children's true and false stories were not successfully differentiated above chance levels. The overall Wilks's lambda for children's third interview was not significant, Wilks's $\Lambda = 0.99, \chi^2(1, N = 76) = 0.09, p = .53$, indicating that children's true and false stories were not successfully differentiated above chance levels.

Consistency Across Interviews

The purpose of analyzing consistency in details was to determine the similarities and differences of children's reporting of both

true and intentionally false reports over multiple interviews. Four consistency variables (new details, omissions, contradictory statements, repeated details) were analyzed. For each consistency variable, a 2 (interviews) \times 2 (veracity: true vs. intentionally false) \times 4 (age group) ANOVA was conducted. Thus, there were three comparisons per consistency variable (Interview 2 vs. Interview 1, Interview 3 vs. Interview 1, Interview 3 vs. Interview 2).

New details. New details were defined as any specific detail that was not mentioned in previous interviews. The results of the interrater analysis was $\kappa = 0.87, p < .01$. There was a significant Interview \times Veracity interaction, $F(1, 74) = 6.11, p = .02$. Comparing Interview 2 with Interview 1, participants made more new statements in their intentionally false reports ($M = 0.55, SD = 0.48, 95\% \text{ CI} [0.34, 0.81]$) than they did in their true reports ($M = 0.42, SD = 0.41, 95\% \text{ CI} [0.19, 0.60]$). However, comparing Interview 3 with Interview 1, there were more new details in the true reports ($M = 0.56, SD = 0.37, 95\% \text{ CI} [0.30, 0.79]$) than in the intentionally false reports ($M = 0.49, SD = 0.43, 95\% \text{ CI} [0.22, 0.70]$). There were no significant differences in new details between Interview 2 and Interview 3.

Omissions. Omissions were coded as any detail that was mentioned in previous interviews but excluded from subsequent interviews. For example, if participants stated in Interview 1 that they had a sticker placed on them during the game but in a later interview did not mention stickers, this was coded as an omission. The result of the interrater analysis was $\kappa = 0.93, p < .01$. There was a significant main effect of interview, $F(1, 74) = 10.19, p = .02$, partial $\eta^2 = .23$, with more omissions in Interview 3 ($M = 0.50, SD = 0.40, 95\% \text{ CI} [0.23, 0.75]$) than in Interview 1 ($M = 0.05, SD = 0.04, 95\% \text{ CI} [0.00, 0.08]$). There was no significant difference in omissions between Interview 2 and Interview 3.

Contradictory statements. When a participant stated a fact in an interview that was inconsistent with an assertion in a later interview, this was coded as being contradictory. The result of the interrater analysis was $\kappa = 0.75, p < .01$. There was a significant age effect, $F(3, 74) = 5.58, p = .002$, partial $\eta^2 = .21$, in which 4- to 5-year-olds ($M = 0.57, SD = 0.30, 95\% \text{ CI} [0.30, 0.81]$) and 6- to 7-year-olds ($M = 0.49, SD = 0.31, 95\% \text{ CI} [0.22, 0.71]$) made significantly more contradictions than 8- to 9-year-olds ($M = 0.28, SD = 0.27, 95\% \text{ CI} [0.09, 0.48]$) and 10- to 11-year-olds ($M = 0.20, SD = 0.23, 95\% \text{ CI} [0.02, 0.39]$). There were no other significant differences between interviews.

Repeated details. Repeated details were coded as any specific details that were recurring across interviews. That is, any detail that appeared in both interviews was coded as a repeated detail. The result of the interrater analysis was $\kappa = 0.94, p < .01$. There was a significant interaction between interview and veracity, $F(1, 74) = 3.79, p = .05$, partial $\eta^2 = .08$. In comparison to Interview 1, participants were more consistent during the true reports ($M = 0.70, SD = 0.24, 95\% \text{ CI} [0.34, 0.88]$) compared with the intentionally false reports ($M = 0.62, SD = 0.31, 95\% \text{ CI} [0.34, 0.88]$) in Interview 2. However, this difference disappeared when comparing Interview 3 with Interview 1 (true: $M = 0.64, SD = 0.34, 95\% \text{ CI} [0.40, 0.85]$; false $M = 0.63, SD = 0.33, 95\% \text{ CI} [0.36, 0.90]$).

Discussion

We hypothesized that verbal expressive markers of true and intentionally false reports would differ. Specifically, we hypothesized that true reports would contain more self-corrections, spontaneous references, admissions of lack of knowledge, and words than intentionally false reports. We also hypothesized that true reports would contain fewer cognitive processes and temporal markers than intentionally false reports. When looking solely at the data from the first interview, these hypotheses were partially supported. As predicted, intentionally false reports in the first interview had fewer spontaneous corrections. They also had more temporal markers, corroborating the findings of Bruck et al. (2002). Furthermore, the number of interviews appears to influence the use of cognitive operations as children used fewer the more they were interviewed. Contrary to predictions and conclusions of previous research (e.g., Bruck et al., 2002), intentionally false reports had more admissions of lack of knowledge during the first interview compared with true reports. There were no differences in terms of self-references. The findings suggest that children's verbal expressive markers can be analyzed to discriminate between their true and intentionally false reports. Overall, these findings replicate previous research showing that intentionally false reports contain fewer spontaneous corrections and contain more temporal markers; however, they contradict existing findings on other verbal expressive markers of children's true and fabricated reports in one interview (Bruck et al., 2002).

A different story emerges when examining the second and third interviews. When children's statements were analyzed over multiple interviews, verbal expressive markers no longer differed between true and intentionally false reports. Discriminant analyses did not yield any significant effects for Interview 2 and Interview 3. The more a child was interviewed, the smaller the differences between the verbal expressive markers of the true and false reports. The current results suggest that there are no clear verbal markers to differentiate true versus intentionally false reports across multiple interviews. Thus, our first hypothesis was minimally supported. It is possible that a rehearsal effect may account for similarities between true and intentionally false reports across interviews. It appears that after the first interview, children were able to anticipate the questions from the interviewer and subsequently provided a similar answer for both their true and intentionally false reports. Results from the current research yield important implications for interpreting children's true and intentionally false reports as witness testimony. The first interview is critical. Only in the first interview were there verbal expressive markers that helped (albeit minimally) to discriminate between true and false statements. Police and child protection workers should make every effort to record their first investigative interview with a child. As it is unclear whether lay people or even frontline workers who have expertise with children would be able to discriminate true versus false reports, having a recording of the first interview would allow for the analysis of verbal markers.

Contrary to our predictions, less than 20% of children in the current study provided any spatial, perceptual, or affective information. As such, we were unable to include these verbal expressive categories in the analyses. It is possible that based on the familiarity of the environment (i.e., the children's homes) and the

nature of the games that spatial, perception, and affective information was not elicited.

It was predicted that children's true reports would contain more omissions and new information, thus appearing less consistent (more contradictions, less repeated details) than their intentionally false reports. Previous research suggests that intentionally false reports tend to be more consistent as individuals try to appear truthful and that consistency is not a reliable indicator of veracity (Quas, Davis, et al., 2007). Furthermore, the repeat versus reconstruct hypothesis predicts that there are differences between liars who are giving intentionally fabricated reports and truth-tellers who are recalling an event that actually happened. Liars try to repeat, to the best of their abilities, the narratives they have previously given. Because truth-tellers reconstruct events from memory, their narratives may be filled with self-doubt and be less consistent. Interestingly, research suggests that the vast majority of lay people believe that the opposite is true: Consistency is a marker for truthfulness and not fabrication (Strömwall & Granhag, 2005). Results from the second interview were not as predicted: Children added more new details to their intentionally false reports than their true accounts. However, these findings were reversed in the third interview, and as such were consistent with our hypotheses. Indeed, participants added more new details to their true accounts than to their intentionally false stories. There were no main effects in terms of veracity for omissions and contradictions. Furthermore, by the third interview, the amount of repeated details was similar for both true and intentionally false reports. In line with previous research (Powell et al., 2003; Quas et al., 2007), differences in consistency of narratives disappeared as children were repeatedly interviewed, revealing the importance of the first interview.

Research has suggested that people practice their intentionally false accounts in order to remain consistent and appear truthful (Strömwall & Granhag, 2005). In the current study, participants rehearsed both true and intentionally false accounts in order to remain consistent and appear believable. Another reason that intentionally fabricated reports became more like true reports in the latter interviews could be that children were deriving their intentionally false reports from the previous interview; therefore, the false reports were also derived from the child's memory (Johnson & Raye, 1981; Strömwall & Granhag, 2005). It could be argued that both stories were being recalled: the true event from the actual play sessions, and the intentionally false report from Interview 1. Furthermore, it is possible that as children were interviewed by the same adult on all three occasions, they may not have repeated as many details because they assumed that the adult already knew these details.

In the current study, the youngest children had the greatest difficulty reporting consistently, regardless of veracity and interview. As hypothesized, younger children were more likely to admit lack of knowledge, add the fewest number of new details across interviews, and make the most contradictions compared with all other age groups. However, with age, these differences disappeared, and older children were better able to give consistent true and fabricated reports. Studies on the development of children's lie-telling have found that children's ability to maintain their lies is related to their cognitive development (Polak & Harris, 1999; Talwar & Lee, 2008). Young children tend to have fewer cognitive resources available for such mental manipulation, restricting their ability to effectively maintain their fabricated re-

ports. Future studies should examine the developmental trajectory of manipulating cognitive load on the ability to construct, deliver, and maintain fabricated reports. However, given the age range of the children in this study, it is surprising that there were not more significant age by veracity interactions suggesting that children of various ages may use the same strategies.

In the current study, no gender differences were found. Research has suggested that adults' perceptions of girls' and boys' reports differ with boys perceived as more likely to be lying than girls (e.g., Talwar & Lee, 2002a; Talwar et al., 2006). However, results of the current study indicate that boys and girls did not differ in their abilities to maintain their true and fabricated reports.

Limitations and Future Directions

Given ethical constraints, the interaction between child and researcher did not explicitly simulate the environment in which children are abused or neglected. Given this, a relatively innocuous event involving touch was used. In clinical and forensic settings, children may be reporting about traumatic events that involve physical harm to the child. Nevertheless, the present situation could be analogous to some situations that children report. Some children who are abused are enticed by an adult using a "game" situation in trying to appear friendly. Once the child is engaged, abusers may incorporate genital touch or inappropriate exposure within the context of the game. The methodology in this study would be partially analogous to this specific abusive situation.

Another potential limitation is that the children were always interviewed by the same individual. It is possible that having multiple interviewers could have changed the responses of the child. In some instances, the same interviewer will interview child witnesses on more than one occasion (e.g., the social worker may interview a child more than once). It also is possible that each time a new professional interviews children, they may repeat more details as they have never told the new interviewers their stories. Given that the child was aware that the adult in the current study had heard their account the day prior, the absence of significant differences between the second and third interviews may have been due to the child's awareness that the interviewer already knew some information about their interactions.

Further compounding this effect is the possibility that parents may have coached differently between interviews. Future research should investigate children's true and intentionally false statements and the level of parental coaching. Moreover, based on the current design, it is unclear whether the time delay or the coaching can account for any of the significant effects. Future studies should account for level of coaching and time delay in order to better understand the effects these may have on children's verbal markers of deception.

There have been new developments in the detection of deception of adults' intentionally false reports that should be explored in terms of children's reports. Vrij et al. (2009) found that asking adults unanticipated questions enhances the detection of liars who were unprepared for this type of questioning. Specifically, they found that less anticipated questions involved spatial details (where was one sitting in relation to the front door) and temporal details (who finished their meal first). In future studies, adding unanticipated questions when interviewing children may increase the differences in verbal expressive markers of true and intention-

ally false reports. Greater differences may be found between child lie-tellers and truth-tellers than adults because of children's less mature cognitive flexibility. In particular, across multiple interviews, it may be useful to include new unanticipated questions in each interview.

In addition, the current findings revealed greater differences between verbal markers of true and fabricated reports in the first interview. Along with research on intuitive lie detection, suggesting that most observers are not capable of correctly discriminating truth from lies (e.g., Edelstein, Luten, Ekman, & Goodman, 2006; Leach, Talwar, Lee, Bala, & Lindsay, 2004), it would be interesting to see whether viewing the first interview would yield higher levels of correct classification than the second and third interviews. Adults having greater difficulty classifying later events would further support the need to record the earliest possible interview. Finally, future research should explore the impact of different interviewers on children's abilities to maintain their truthful and fabricated reports across repeated interviews.

Conclusion

Because child witnesses involved in the judicial process are asked to recount their stories on many occasions, the investigation of multiple interviews warrants further investigation. By asking children to give multiple reports of multiple events, the current study permits a better understanding of the difficulty that investigators, judges, and jurors face in determining the veracity of children's statements about repeated victimization. The findings indicate that there are verbal cues that may aid in the differentiation of true and fabricated reports. However, the verbal expressive markers that aided in the classification during the initial interview are no longer diagnostic during subsequent interviews. Translating our findings into applied settings, the first account of a child's story may be the best interview to use when determining the veracity of a child's statements. As such, all frontline workers such as child protective services and police officers should make every effort to record the first interview with a child to facilitate the detection of deception.

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