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ORIGINAL ARTICLE

Detecting Lies in Children and Adults

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Abstract In this study, observers' abilities to detect lies in children and adults were examined. Adult participants observed videotaped interviews of both children and adults either lying or telling the truth about having been touched by a male research assistant. As hypothesized, observers detected children's lies more accurately than adults' lies; however, adults' truthful statements were detected more accurately than were children's. Further analyses revealed that observers were biased toward judging adults' but not children's statements as truthful. Finally, consistent with the notion that there are stable individual differences in the ability to detect lies, observers who were highly accurate in detecting children's lies were similarly accurate in detecting adults' lies. Implications of these findings for understanding lie-detection accuracy are discussed, as are potential applications to the forensic context.

Keywords Children · Lying · Lie detection · Individual differences

Introduction

Both legal professionals and psychologists have an interest in the study of lie detection. In a legal setting, jurors, police officers, and attorneys are among those entrusted with the responsibility of determining when others are telling the truth. Accordingly, how people detect lies in others, and how accurately they do so, are questions of considerable forensic importance (Frank & Ekman,

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2004). These questions have also interested psychologists, in part, because of our human desire to know when we are being lied to, be it by our children, spouses, colleagues, or others.

Despite this interest in lie-detection, relatively few studies have examined adults' abilities to detect children's lies. Just like adults, children may be called upon by legal professionals to recount events that may or may not have happened, and fact-finders must determine the veracity of their statements. Children's statements may be particularly influential in cases where physical evidence of a crime is lacking, such as in many cases of child sexual abuse. Yet, relatively little is currently known about how accurate people are at determining when children are lying. The goal of this study was to redress this gap in the literature by examining adults' abilities to detect lies in children and adults. In addition, we were interested in the extent to which lie-detection abilities were generalizable across targets, that is, whether individuals who were particularly accurate in detecting adults' lies would be similarly accurate in detecting children's lies.

How accurate are people at detecting lies?

For purposes of this study, lying is defined as a deliberate falsification, in which the target has not been forewarned of the speaker's intention to lie (Ekman, 1997; Ekman, 2001). This is in contrast to other forms of deception (e.g., by magicians or poker players) in which the target is notified, either implicitly or explicitly, that misinformation may be provided. Findings from studies of lie detection indicate that, on average, people's accuracy in detecting adults' lies rarely exceeds that which would be expected by chance (Ekman, O'Sullivan, Friesen, & Scherer, 1991; Malone & DePaulo, 2001; Vrij & Baxter, 1999). These results may reflect adult liars' ability to conceal indicators of deception, observers' inability to perceive cues exhibited by liars, or both. Moreover, insofar as these findings can be extended to the forensic context, they suggest that it may be particularly difficult to distinguish witnesses who are lying from those who are telling the truth.

Developmental research suggests that as children get older, their understanding of deception improves and they become increasingly able to deceive others (DePaulo, Stone, & Lassiter, 1985; Lewis, 1993; Talwar & Lee, 2002; Wilson, Smith, & Ross, 2003). Although it has been hypothesized that young children's lies should therefore be more readily detectable compared to those of adults, few studies have directly addressed this issue. There is some evidence that adult observers are highly accurate in their detection of truth and lies in first graders (Morency & Krauss, 1982), whereas accuracy scores for fourth and fifth graders are somewhat lower (Allen & Atkinson, 1978; Orcutt, Goodman, Tobey, Batterman-Faunce, & Thomas, 2001; Westcott, Davies, Graham, & Clifford, 1991).

For instance, in one study, college students assessed the truthfulness of 32 children (ages 7–8 and 10–11 years) who were videotaped either lying or telling the truth about a visit to a natural history museum (Westcott et al., 1991). Participants' overall ability to detect children's lies was only slightly above chance (59%), a rate comparable to that found in studies concerning adults' lies. Accuracy was higher, however, when younger children and boys were being assessed. Results also suggested a truth bias, such that participants were more likely to judge the children to be telling the truth than to be lying.

Although these findings suggest that lie-detection accuracy decreases with the age of the target, to our knowledge only one published study has compared untrained observers' accuracy in detecting lies among child versus adult targets (Feldman, Jenkins, & Popoola, 1979). Feldman et al. (1979) investigated adults' ability to tell when third graders, seventh graders, and adults were lying about a drink's taste. These researchers found that participants were better able to identify when third graders were lying than when either seventh graders or adults were lying. There was no significant difference between participants' lie-detection accuracy for seventh graders and

adults. These findings suggest that, at least by the seventh grade (i.e., approximately age 12), children have become proficient enough in controlling their nonverbal behavior to hide indicators of lying.

It is important to note that these findings may be limited in their generalizability to the forensic context. That is, children in these studies told relatively innocuous lies (e.g., about a visit to a museum), which may differ from the kinds of lies told, for instance, during police investigations or criminal trials. In the present study, children, aged 5–7, and adults were asked to lie about being touched by a male research assistant. This particular lie was chosen because of its possible forensic implications; for instance, sexual abuse allegations often involve (potentially false) accusations of inappropriate touching. On the basis of prior research, we hypothesized that observers would be more accurate when detecting the lies of children than those of adults.

Are there stable individual differences in the ability to detect lies?

Although most observers rarely exceed chance accuracy when detecting lies, there is some evidence that certain groups of individuals (i.e., Secret Service and CIA agents, police officers, sheriffs, and "deception-interested" psychologists) can detect lies at significantly higher rates (e.g., (Ekman & O'Sullivan, 1991; Ekman, O'Sullivan, & Frank, 1999; Mann, Vrij, & Bull, 2004). Individuals who are highly accurate when distinguishing truth from lies also tend to score high on tests measuring the ability to recognize microexpressions of emotion (facial expressions present for only a quarter of a second) (Ekman & Friesen, 1969), a finding that has been replicated many times, including in the United States, England, and Canada (Ekman, 2001). These findings suggest that, under certain circumstances, liars may exhibit behavioral cues that the trained (or experienced) perceiver can use to determine the veracity of their statements.

These findings also suggest that there are relatively stable individual differences in the ability to detect lies. Insofar as lie-detection success is a stable characteristic of an individual, it may be related to other abilities, such as skill in "reading" others' emotions. Along these lines, studies have been conducted to examine whether detection accuracy is associated with the ability to interpret nonverbal behaviors (Littlepage, Maddox, & Pineault, 1985; Littlepage, McKinnie, & Pineault, 1983) or with other personality factors, such as self-monitoring (Kraut & Poe, 1980) or social anxiety (DePaulo & Tang, 1994). Most of these studies have found no relation between personal abilities and detection accuracy (but see DePaulo & Tang, 1994).

There is some evidence, however, that observers' ability to detect lies in one target is related to their ability to detect lies in another target. Frank and Ekman (1997), for instance, compared individuals' detection abilities across two different types of lies (i.e., a false opinion scenario, in which participants had to lie about a strongly held opinion, and a crime scenario). Results indicated that the ability to detect lies in one scenario was positively related to the ability to detect lies in the other scenario (see also Frank & Ekman, 2004), suggesting that lie-detection abilities may generalize across situations and may therefore reflect a relatively stable individual difference or ability. Following this line of reasoning, we hypothesized that observers who were accurate in their detection of adults' lies would be similarly accurate in their detection of children's lies.

Method

Observers

Participants (i.e., observers) were 144 undergraduate students, ranging in age from 17 to 34 years ($M = 20.3$ years, $SD = 2.30$). Fifty-eight percent of the sample was female. Approximately 80%

of observers described themselves as U.S. citizens, and 67% reported that their first language was English. The ethnic composition of the sample was 38% Asian American, 32% Caucasian – non-Hispanic, 11% Hispanic, 4% African American, and 15% of various other descents. Students participated in exchange for course credit.

Materials

Videotaped interviews

Observers were shown two series of videotaped interviews, one of adults and one of children. All interviews were approximately 5 min in duration. The videotape of adults included individual interviews with five men and five women between the ages of 18 and 24 years. The videotape of children included five male and five female children between the ages of 5 and 7 years. For each interview, the videocamera was positioned to provide a close-up head-on-view of the child's or adult's face and upper torso as he or she sat next to an interviewer behind a desk. The interviewer, who was blind to the experimental hypotheses and whether the interviewees were lying or telling the truth, was also visible on the videotape. The videocamera was concealed from the liars/truthtellers, although they had been informed that a video recording would be taken.

Both children and adults were interviewed about a play session that had occurred in a university laboratory with a male research assistant named Kris. During the session, which involved a single child or adult at a time, Kris touched half of the participants on their bare stomach, nose, and neck (in the context of a game). Approximately 2 weeks later (M = 11.5 days), participants returned to the laboratory for a standardized interview about their interaction with Kris. The same 30-question interview was used for both children and adults. The interview began with a series of open-ended questions (e.g., "Tell me what happened when you came here last time"). However, the majority of questions were closed-ended and focused primarily on whether participants had been touched by Kris (e.g., "Did the man touch your nose?," "Did he touch your stomach?").

Participants who were touched on their bare stomach, nose, and neck during the play session were asked to answer all questions truthfully. Participants who were *not* touched on their bare stomach, nose, and neck during the play session were asked to lie during their interviews, that is, to say that Kris had touched them on the bare stomach, nose, and neck, when he had not done so. Children and adults who were instructed to lie were told to pretend that they were actors/actresses and to be as convincing in their lies as possible.

Procedure

Observers viewed the videotaped interviews in small groups of approximately 20 people. Two versions of the child and adult videotapes were created, varying in the order of interview presentation. Both order of presentation (i.e., child vs. adult) and videotape version were counterbalanced across groups. After obtaining informed consent, observers were given a rating sheet with the age of each liar or truthteller indicated next to the corresponding item number, and an instruction sheet describing the interview scenario. Observers were instructed that after watching each interview they were to indicate on the rating sheet whether or not they thought the person had been lying. Observers were not told how many interviewees were lying or telling the truth.

A practice interview was shown to familiarize observers with the video format and the rating sheet. Observers were not given feedback as to whether the practice person was lying or telling

Table 1 Mean proportion accuracy scores for child and adult targets according to honesty condition

Honesty condition	Target age	
	Children	Adults
Truth	.48 (.26)	.59 (.25)
Lie	.52 (.23)	.41 (.23)

Note. $N = 144$. Standard deviations are given in parentheses.

the truth. The rest of the interviews per age group (child vs. adult) were then shown. After each interview, observers were given a chance to make their judgments before the videotape continued. The same procedure was repeated for the second videotape.

Results

Observers' accuracy was determined by computing the proportion of interviews correctly identified (i.e., truth vs. lie). Separate scores were calculated for the child and adult interviews. Preliminary analyses indicated that the order of video presentation (i.e., whether child or adult targets were viewed first) and video version were unrelated to detection accuracy; thus, neither is considered further.[1]

Detection accuracy

On average, observers accurately evaluated 50% of both child, $M = .50$, $SD = .18$, *range* = .10–.90, and adult, $M = .50$, $SD = .19$, range = .10–.90, targets. Accuracy was unrelated to observer age, gender, or ethnicity. To determine if accuracy varied according to whether the targets were lying or telling the truth, a 2 (target age: child vs. adult) $\times$ 2 (honesty condition: truth vs. lie) repeated-measures analysis of variance (ANOVA) was conducted, with the proportion of targets correctly identified serving as the dependent variable. The means from this analysis are presented in Table 1. Results revealed a significant main effect of honesty condition, $F(1, 143) = 12.17, p = .001, \eta_p^2 = .08$, and a significant interaction between target age and honesty condition, $F(1, 143) = 47.14$, $p < .001$, $\eta_p^2 = .25$. Simple effects analyses indicated that participants were significantly more accurate in detecting adults' versus children's truthtelling, $F(1, 143) = 19.02, p < .001, \eta_p^2 = .12$, and, as predicted, children's versus adults' lying, $F(1, 143) = 24.51, p < .001, \eta_p^2 = .15$.[2]

[1] Although accuracy was unrelated to videotape order (i.e., child vs. adult targets viewed first), there was a general tendency for accuracy to decrease across interviews, particularly for adult targets in the lying condition. It is possible that these targets were more consistent in their statements, which made them appear more believable, or that observers were less attentive to later targets. When analyses were reconducted using only the first three targets viewed in each category (i.e., child and adult targets lying and telling the truth; 12 targets in total), the pattern of results obtained was virtually identical to that reported here.

[2] Accuracy for individual targets ranged from 32 to 77% for the truthtelling child targets, 20 to 79% for the lying child targets, 45 to 84% for the adult truthtelling targets, and 17 to 72% for the adult lying targets.

Signal detection analyses

Although proportion accuracy is typically used to assess lie-detection success (Malone & DePaulo, 2001), an important limitation of the analyses just presented is their failure to consider truth and lie judgments simultaneously. That is, because 50% of the targets in this study lied about their experience and 50% told the truth, chance performance (i.e., 50% accuracy) could result if observers judged all targets to be telling the truth (or to be lying). Alternatively, 50% accuracy could be obtained if a participant performed at chance on *both* truthful and untruthful interviews. This limitation is addressed by signal detection analysis (Green & Swets, 1966; Swets, Dawes, & Monahan, 2000), which provides a measure of *discrimination* (d') between two groups of items (i.e., honest and dishonest reports, for purposes of the present study). Higher d' scores reflect better discrimination abilities; a d' score of zero indicates chance performance.

Signal detection analysis also provides information about observers' biases (β) in making these determinations. For example, are observers more likely to think that children are lying compared to adults, or vice versa? For purposes of this study, a positive β score reflects a tendency to judge targets as lying, whereas a negative score reflects a bias toward "truth" judgments; a β score of zero indicates the absence of bias.

The d' scores

The d' scores in this study ranged from -2.12 to $+2.12$ and were unrelated to observer age, gender, and ethnicity. A repeated-measures ANOVA revealed that there was no significant difference in observers' ability to discriminate between truth and lies for child, $M = .001$, $SD = .96$, versus adult targets, $M = .006$, $SD = 1.04$. Note that, on average, participants were at chance when discriminating between truth and lies for both child and adult targets.

β scores

β scores ranged from -1.0 to $+1.0$, and were not significantly related to observers' age and ethnicity. Because preliminary analyses indicated that bias was related to participant gender, a 2 (gender) $\times$ 2 (target age: child vs. adult) ANOVA was conducted. Results revealed main effects of both gender, $F(1, 142) = 4.68$, $p < .05$, $\eta_p^2 = .03$, and age, $F(1, 142) = 35.57$, $p < .001$, $\eta_p^2 = .20$. As can be seen in Table 2, participants were relatively unbiased when evaluating children's statements, but were biased to judge adults' statements as truthful. Women were also more likely than men to make "truth" judgments. The interaction between gender and target age was nonsignificant.

Table 2 Bias (β) scores for child versus adult targets

	Target age		
Gender	Child	Adult	Mean
Male	.10 (.44)	−.11 (.46)	−.01 (.33)
Female	.04 (.29)	−.28 (.41)	−.12 (.28)
Mean	.06 (.36)	−.21 (.44)	−.07 (.31)

Note. $N = 144$. Standard deviations in parentheses. Negative scores indicate a bias toward "truth" responses, whereas positive scores indicate a bias toward "lie" responses.

Relation between accuracy with adults and with children

The second goal of this study was to determine whether the ability to detect lies in children is related to the ability to detect lies in adults. Results were consistent with the hypothesis that lie-detection ability is a generalizable skill: The correlation between observers' overall detection-accuracy scores for adults and children was significant, $r = .39$, $p < .001$, as was that between d' scores for adults and children, $r = .40$, $p < .001$. Thus, observers who were accurate in detecting truth and lies in adults were also likely to be accurate in detecting truth and lies in children. In addition, bias scores for children and adults were significantly related, $r = .18$, $n = 144$, $p < .05$, suggesting that observers were somewhat consistent in their tendency to favor "truth" or "lie" judgments.

Discussion

This study was designed to investigate adults' abilities to detect lies in children and adults. We had two primary goals: First, we examined the hypothesis that adults are more accurate in detecting children's compared to adults' lies. Second, we considered the relation between accuracy of lie detection for child and adult targets.

How accurate were observers at detecting lies?

Overall lie-detection accuracy in this study was 50% for both children's and adults' statements. This finding is consistent with previous research, which indicates that untrained observers rarely exceed chance performance in lie detection (Ekman et al., 1991; Malone & DePaulo, 2001).

On the basis of the previous research, which suggests that the ability to deceive others develops with age (DePaulo et al., 1985; Talwar & Lee, 2002), we hypothesized that children's lies would be more accurately detected than those of adults. This hypothesis was partially supported: Observers were significantly more accurate when detecting children's versus adults' lies. However, the opposite pattern emerged for truthtelling determinations: Observers were more accurate when assessing adults' compared to children's truthtelling. Moreover, accuracy was above chance only for the adult truthful interviews, whereas accuracy for the adult untruthful interviews was significantly below chance.

That observers were more accurate in determining children's compared to adults' lying, with the reverse pattern evident for truthtelling, suggests that observers may be biased in making these determinations. Indeed, signal detection analyses indicated that observers were more likely to make "truth" judgments when evaluating adult interviews, but were equally likely to make "truth" or "lie" judgments when evaluating child interviews. Moreover, analysis of d' scores revealed no significant differences in observers' ability to discriminate between adults' versus children's truthful and untruthful statements. Although very few prior studies of lie detection have incorporated signal detection analyses (Malone & DePaulo, 2001), findings from the present study highlight the importance of using such measures, which simultaneously consider accuracy for both truthful and untruthful statements. It is possible that previous findings, indicating greater lie-detection accuracy for younger versus older child targets, similarly reflect response biases rather than the actual behavior of the targets (or the skill of the observers).

The truth bias uncovered in this study is consistent with previous research on lie detection in adults (DePaulo, Charlton, Cooper, Lindsay, & Muhlenbruck, 1997; Malone & DePaulo, 2001; Vrij & Baxter, 1999) and children (Westcott et al., 1991). Of note, however, Ekman et al. (Ekman & O'Sullivan, 1991; Ekman et al., 1999) found the opposite pattern of results among

(predominantly male) law enforcement officers; these individuals appeared to be biased toward judging adult targets as untruthful. Thus, a truthtelling bias may be evident primarily among laypersons, such as college students, or at least among those who are judging people they know are not suspected of a crime.

The findings of Ekman et al.(Ekman & O'Sullivan, 1991; Ekman et al., 1999) may also reflect the small percentage of women in law enforcement. In the present study, female observers were more likely than male observers to believe both children and adults. This finding is consistent with research on jurors' perceptions of child sexual abuse victims (Bottoms & Goodman, 1994; Castelli, Goodman, & Ghetti, in press; Golding, Sanchez, & Sego, 1997; McCauley & Parker, 2001) and adult rape victims (Frazier & Borgida, 1988). In these studies, female mock jurors are more likely than their male counterparts to find both children's and adults' statements credible.

Further research is necessary to better understand why observers were more likely to believe adults than children in this study, and to examine the source of observers' biases. It is also important to examine whether this bias generalizes to forensic settings: To the extent that judges, jurors, or attorneys are predisposed to believe that adults (but not children) are telling the truth, children may be perceived as less credible when recounting their experiences, simply because of their age. Manipulating the conditions under which observers make their judgments (i.e., resulting in more or less conservative decisions) could elucidate factors that contribute to these biases.

It is important to note that, as in most studies of lie detection, our findings are generalizable only to instances of deliberate falsification. Lies told under different circumstances (e.g., as the result of overly suggestive or coercive interview procedures) may differ in the ease with which they can be detected by observers.

Are there stable individual differences in the ability to detect lies?

As argued by Frank and Ekman (1997), if the ability to detect lies is a relatively stable and generalizable skill, detection accuracy should be correlated across situations in which lies are being told. Although in the present study only one situation (i.e., lying about being touched) was employed, two groups of targets (i.e., children and adults) were involved. Thus, observers' accuracy across these two groups could be compared.

Consistent with the hypothesis that lie-detection abilities are generalizable, we found that observers' abilities to detect lies in children were strongly related to their abilities to detect lies in adults. Although the average observer was at chance when discriminating between true and false statements, those who were highly accurate (or inaccurate) with one group of targets were also highly accurate (or inaccurate) with the other group. This finding suggests that some observers may be especially skilled at determining the veracity of others' statements. Future research may uncover particular skills or personality characteristics that may be important for detection success, for example, empathy, sensitivity to social cues, or conscientiousness. Moreover, further research focused on highly accurate observers may identify specific behavioral or verbal cues indicative of lying (e.g., facial expressions) (Frank & Ekman, 2004); such information could be useful for training police officers, judges, or other individuals involved in judging the veracity of children's and adults' statements.

Note that previous research has generally failed to find a relation between observers' abilities to detect lies in one individual and their abilities to detect lies in another individual (Kraut, 1978). Ekman (2001) has argued that these findings are due in part to the "low-stakes" nature of the lies being detected. That is, when people are telling relatively innocuous lies, they tend not to be concealing strong negative emotions that could betray their true feelings. Indeed, when Frank and Ekman (1997) compared individuals' detection abilities across two different types of

"high-stakes" lies (i.e., a false opinion scenario and a crime scenario), both with considerable rewards and punishments at stake, they found that the ability to detect lies in one scenario was positively related to the ability to detect lies in the other scenario (see also Frank & Ekman, 2004). It is possible that the correlation obtained in the present study between detection accuracy for child and adult targets similarly reflects the nature of the lies being told: Targets were asked to lie about being touched by a male research assistant, which may be more anxiety-provoking than being asked to lie, for instance, about visiting a museum or the taste of a drink. Cues indicative of lying may thus have been more detectable, at least to some observers, in the present study than in previous research. More generally, insofar as lies told in a forensic context (e.g., about having committed a crime) are similarly anxiety-provoking, it is possible that such lies would be more easily detectable, particularly to skilled or experienced observers, than those told in most laboratory studies of lie-detection (Frank & Ekman, 2004). If so, the implications for the courtroom are far-reaching. For example, some jurors may be particularly skilled at detecting high-stakes lies when a witness takes the stand. It would be of interest in future research to determine if such jurors have any greater sway in juror decision-making.

Conclusions

In summary, this study extends previous research on lie detection in several ways. First, our findings provide some support for the prediction that children's lies are more easily detected than those of adults. Second, our results indicate that observers may be biased to judge adults' (but not children's) statements as truthful, at least in the context of the present study. Third, women were more likely than men to show this truth bias. The source and extent of these biases deserve attention in future research. Finally, results from this study are consistent with those of Frank and Ekman (1997) in suggesting that some individuals are particularly skilled at detecting lies. A closer examination of the personality characteristics of highly accurate observers, and the strategies they use to detect lies, may lead to a better understanding of the specific skills involved in lie detection.

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