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Eyewitness Testimony of Children in Target-Present and Target-Absent Lineups*

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The effects of age of witness and age of suspect on eyewitness testimony were investigated. Forty-eight elementary school children and 48 college students viewed a slide sequence of a mock crime. This was followed by target-present or target-absent photo identification with a no-choice option, central and peripheral questions related to the crime, and a second photo identification. In photo identification, child witnesses had a higher rate of choosing than adult witnesses, suggesting that children have more lax criteria of responding. The accuracy data showed similar levels of sensitivity across ages although there was a trend toward reduced accuracy of child witnesses in target-absent lineups. All witnesses made more total choices and more correct rejections with child-suspect lineups than adult-suspect lineups. Central questions were answered better than peripheral questions by both age groups, but adults made significantly more "don't know" choices.

In the past few years, there has been an upsurge in the interest of eyewitness testimony of children (e.g., Ceci, Toglia, & Ross, 1987a; Gruneberg, Sykes, & Morris, 1988). With the heightened concern of child abuse, children are more evident in the courtroom, thus magnifying the need to determine their credibility. Researchers are focusing on the interaction of laws, legal practices, and current psychological knowledge in evaluating children's eyewitness testimony.

The present study addresses the child's cognitive capabilities in the eyewitness task, particularly with respect to memory. One way of measuring retention in the eyewitness situation is photo identification. Research on children's facial

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identification has involved many laboratory facial recognition studies but only a few eyewitness identification studies (see Shapiro & Penrod, 1986). Most laboratory facial recognition studies have shown that the number of correct identifications increases with age (e.g., Blaney & Winograd, 1978; Ellis, Shepherd, & Bruce, 1973; Flin, 1980; Goldstein & Chance, 1964). However, these facial recognition tasks differ substantially from real-life eyewitness situations. The laboratory facial recognition test usually involves a large set of distractor and target photos with the target photos identical on study and test. On the other hand, attempts to simulate the eyewitness situation with children have used recognition tests (lineups) with one target photo and several distractor photos (e.g., Goodman & Reed, 1986; King & Yuille, 1987; Marin, Holmes, Guth, & Kovac, 1979; Parker, Haverfield, & Baker-Thomas, 1986).

For the past decade, most eyewitness studies have failed to demonstrate developmental differences in photo identification (Davies, Stevenson-Robb, & Flin, 1988; Goodman, Hepps, & Reed, 1986; Marin et al., 1979; Parker et al., 1986). Recently, an attempt has been made to study young preschool children, and age differences in correct identifications are emerging. Goodman and Reed (1986) found an inferiority for 3-year-olds compared to adults, although this inferiority was not evident in 6-year-olds. In a later study, Goodman, Aman, and Hirschman (1987) confirmed this finding but only at long retention intervals of 7–9 days and not at shorter retention intervals of 3–4 days. Comparing younger children with older children, both Peters (1987) and King and Yuille (1987) found that children 6 years old or below were inferior to older children in correct identifications. Thus, when examining correct identifications, there appears to be a break around 6 years of age, with children below that age having greater difficulty correctly identifying the perpetrator than those above that age. Clearly, the gradual improvement observed across age with facial recognition is not evident in eyewitness simulation studies.

In the current study, the possibility of further developmental differences in eyewitness photo identification is examined within the context of Signal Detection Theory (SDT). SDT is highly relevant in conceptualizing the two processes of decision criterion and witness sensitivity that exist with every identification (Malpass & Devine, 1981). Sensitivity refers to the witness's memory strength of the offender's appearance, whereas decision criterion refers to the witness's response biases. The addition of a none-of-the-above or no-choice alternative (called the optional forced-choice paradigm by Flexser and Parker, 1986) in the photo identification lineups of the present study allows one to focus on the criterion biases of the witness as well as the sensitivity of the witness. Furthermore, the inclusion of this alternative is consistent with police policy to inform the witness that the suspect may or may not be in the lineup and allow the witness to indicate if he cannot identify the suspect. It may be that children and adults have been considered similar in eyewitness photo identification solely because of the emphasis on correct identifications or sensitivity. With a more ecologically valid lineup procedure that can reflect the witness's natural tendency to choose or guess as well as accuracy of response, developmental differences may emerge. Particularly, it is hypothesized that children (even those above 6 years of age) may feel more pressured than adults to choose a photo and thus may show a more relaxed or liberal criterion.

In addition to using the optional forced-choice paradigm, the present study also included both target-present and target-absent lineups. Both lineup types are necessary for forensic validity because the police may or may not have the perpetrator in the lineup. In target-absent lineups, an age superiority in correct responses (correct rejections) may emerge because of the hypothesized relaxation of decision criteria by child witnesses. A tendency for child witnesses to make more choice responses necessarily results in more errors in the target-absent situation. Furthermore, an accurate evaluation of correct identifications cannot be made without an examination of false identifications in target-absent lineups because the rate of choosing foils in target-present lineups does not alone provide this information (Malpass & Devine, 1984). Ultimately, the issue of false-positive responding may be more critical to eyewitness identification problems than accuracy of choice (Chance & Goldstein, 1984). In other words, choosing an innocent person may be more serious than a failure to choose the perpetrator of the crime.

Most previous child eyewitness identification studies have used only target-present lineups, but two studies conducted concurrently with the present study included target-absent lineups and have confirmed our expectations. Davies et al. (1988) showed that 7- and 8-year-olds made fewer correct rejections in target-absent lineups than 11- and 12-year-olds, and Yarmey (1988) observed a lax criterion for children 6 years of age. The present study extends these studies by directly comparing the decision criteria and memory sensitivity of both children and adults.

Another issue of importance is the reliability of eyewitness behavior. This issue was examined using the traditional test–retest method in which two lineups, separated by approximately 10 min of objective questions, were administered and any changes in performance were monitored. Although the judicial system often requires multiple reports and identifications, few studies have reported the effects of repeated testing. Gorenstein and Ellsworth (1980) observed that adults who made an incorrect identification in a target-absent, forced-choice paradigm were more likely to repeat the same incorrect choice than choose the correct alternative on a retest with target present. A comparable commitment effect in which adults maintained their decisions from Lineup 1 to 2 was evident in the Parker et al. (1986) study. On the other hand, Parker et al. observed that children were more likely than adults to change choices on repeated testing. The present study will determine whether this developmental difference still exists with the optional forced-choice paradigm. In particular, adults may not show a commitment to a none-of-the-above choice as they do to an actual photo. Gorenstein and Ellsworth (1980) suggest that when a person commits to a choice of an incorrect face this becomes new information that must be matched against old information. In line with Loftus's model (Loftus, 1981), if there are few discrepancies between the new incorrect face and the old correct face, the incorrect face is accepted and adjustments are made in memory. Obviously, such a process cannot exist when the first choice is the none-of-the-above alternative.

A performance measure that has traditionally been used to evaluate the accuracy of the identification response is eyewitness confidence. In fact, the United States Supreme Court (*Neil v. Biggers,* 1972) has recommended that confidence be used as a predictor of eyewitness accuracy, and several studies have shown that eyewitness confidence plays a significant role in the credibility people ascribe to identification testimony (e.g., Lindsay, Wells, & Rumpel, 1981; Wells, Ferguson, & Lindsay, 1981). However, as Wells and Murray (1984) point out in their review of 31 studies, the available data on correlations between confidence and accuracy are divided, with 13 studies finding significant correlations, and the remaining 18 finding none. A recent meta-analysis of 35 staged-event studies by Bothwell, Deffenbacher, and Brigham (1987) is somewhat more optimistic, reporting an estimated correlation of .25. Clearly, the relationship of confidence and accuracy is not yet resolved.

In the present study, the absolute confidence levels of children's and adult's testimony were compared. Likewise, the confidence/accuracy relationship was examined according to criteria established by Wells and Lindsay (1985). Parker et al. (1986) did find, with target-present lineups, that both children and adults showed similar absolute confidence levels and positive confidence/accuracy correlations. It remains to be determined what children's absolute confidence levels and confidence/accuracy correlations will be in both target-present and target-absent lineups with the optional forced-choice paradigm.

Age of suspect as a variable in photo identification was also examined in the present study. Reference to eyewitness identification studies with sex (e.g., Ellis et al., 1973) and race (e.g., Brigham & Barkowitz, 1978) as variables has shown that suspects of one's own sex or race are easier to identify. Analogously, it might be expected that suspects of one's own age also might be easier to identify. Very few identification studies have included the suspect's age as a factor (Cross, Cross, & Daly, 1971; List, 1986; Parker et al., 1986), and the results have differed across studies. Cross et al. did not report a statistical breakdown of the factor, and Parker et al. found no evidence for a cross-age or own-age preference. List examined the age of suspect variable in the context of a recognition test of yes–no questions about the crime and found an own-age preference for older adults that was not evident for younger adults. Thus, further research of this variable is warranted in the context of the optional forced-choice paradigm.

Although the major variable of interest in this study was photo identification across the two test trials, performance on objective questions related to the crime was also examined. Parker et al. (1986) observed that questions descriptive of the suspect were answered better than peripheral questions by adults, whereas there was no difference between question types for children. The present study sampled content areas that differed from Parker et al. for both the central and peripheral categories in an attempt to replicate the previous findings under new constraints.

The current study was designed to examine developmental differences in memory sensitivity and decision criteria in the photo identification of child and adult suspects. Test–retest reliability of identifications, the confidence/accuracy relationship, and performance on central and peripheral questions about the crime were also studied.

METHOD

Subjects and Design

Age of witness (child and adult) was factorially combined with age of suspect (child and adult) and with type of lineup (target-present and target-absent). Males and females were equally represented in each age-of-witness group. Forty-eight college students from Florida International University (M = 21 years) and 48 elementary-school children (M = 9 years) from West Laboratory School in Miami, Florida, served as subjects. The subjects were run in groups of 2 (target-present and target-absent) and were assigned to conditions in order of their appearance at the laboratory. The 2 subjects were separated by a portable screen so they could not see each other at the time of test.

Materials

Slide Sequences

Four slide sequences of 15 color slides each were constructed: two with all adults as participants (M = 24 years) and two with all children (M = 9 years). Within each age group, two different people served as the suspect in the crime. In all slide sequences the same scenario appeared. Basically, it involved a picnic scene at the park with three males and four females eating chips, drinking soda, and playing frisbee. On the 11th slide a fourth male enters and steals a radio from a blanket. The suspect is viewed in frontal view for three slides and in rear view for one.

Photograph Lineups

Lineups were composed of six 10.25 cm × 7.75 cm, black and white, head and shoulder, frontal-view photographs of the target and five distractors. Photographs were taken of 13 boys (M = 9 years) and 13 adult males (M = 24 years) who were chosen for their similarity in general appearance to one of the suspects. All were photographed in white T-shirts and with a serious expression. Eight adult subjects rated the similarity of the child distractors to one child suspect and the adult distractors to one adult suspect. Eight different adult subjects did likewise for the remaining child and adult suspects. From these ratings, separate lineups were constructed for each suspect, with the middle level of similarity typically chosen. (A pilot study showed that the highest level of similarity resulted in chance level identifications.) This resulted in four lineups: two lineups with different children as suspects (ages = 8 and 10) and two lineups with different adults as suspects (ages = 21 and 26).

Lineup Characteristics

Two measures of lineup fairness were used to evaluate the bias (functional size) and size (effective size) aspects of fairness (cf. Malpass & Devine, 1983) of the four lineups. Functional size focuses on the bias towards or away from the target, whereas effective size focuses on the degree to which a lineup contains implausible foils. Responses of mock witnesses were used to compute the functional (Wells, Leippe, & Ostrom, 1979) and effective sizes (Malpass, 1981). Initial determinations of effective and functional size required that certain foils be substituted for others in order to maximize lineup fairness.

After receiving a general description of the crime scene, 598 mock witnesses were given particular information regarding the age, race, and body-build of the suspect. They then viewed a slide of the lineup with the suspect (target-present) or suspect-substitute (target-absent) in either Position 2 or 4. Subjects were instructed to choose who they thought committed the crime, or, if they thought the suspect was not present, to choose the none-of-the-above alternative. The mock witnesses were tested in groups (ranging in size from 5 to 45) with each witness viewing two lineups, one from each age group. Because the target was placed in two different positions in both target-absent and target-present lineups, there were necessarily eight different testing groups.

Procedure

All subjects saw a 15-slide sequence of a simulated crime at a rate of 5 s per slide. They were instructed to determine what was happening in the story told by the slides because they later would be asked questions about the slides. Half of the subjects from each age group viewed slides in which a child was the suspect and half viewed slides in which an adult was the suspect. Immediately after the slide sequence, all subjects were asked to try to identify the suspect from a 6-person photographic lineup and a none-of-the-above alternative. They were informed that the suspect might or might not be in the lineup. For half the subjects the target was present in the lineup with five foils, and for half the subjects the target was replaced by another foil. The photos were presented in a 2×3 array with identifying numbers beneath each photo. The position of the target or target-substitute was counterbalanced across subjects so that each position was equally represented. Subjects were instructed to place a check mark beside the identifying number of the person they thought stole the radio or beside the none-of-the-above alternative in the booklet in front of them. They were asked to mark how confident they were of their choice by choosing one of three alternatives: (1) very sure; (2) think so, but not sure; (3) just guessing.

Subjects then answered 10 multiple-choice questions of which 5 were about central characteristics of the suspect or the stolen object and 5 were about peripheral events. Central and peripheral questions were alternated. All questions were presented with four answers including a "don't know" alternative. (See Appendix.)

Approximately 10 min later, a second lineup with the same photos, but in different positions, was administered to all subjects. This was followed by a second confidence rating.

RESULTS

Characteristics of Lineups

The effective and functional sizes of all lineups were calculated separately for the target-absent and target-present lineups with the no-choice alternatives (55 of 598) excluded from the calculations. The effective sizes of all eight lineups were similar, ranging from 4.6 to 5.1. The functional sizes of the lineups were also comparable, ranging from 3.5 to 7.6 except for one child target-absent lineup with a functional size of 14.8.

Photo Identification

Overall, 34% of the subjects made the correct choice on Lineup 1 and 36% on Lineup 2. The position of the suspect or suspect substitute in the photographic array had no effect on the subject's choice, χ^2 (5, N = 192) = 1.35, $p > .05$.

Table 1 shows the frequencies and mean proportions of correct responses and errors in Lineup 1 and Lineup 2 as a function of age of witness and age of suspect. Wells and Lindsay's (1985) designation of two types of correct responses (correct identifications in target-present lineups and correct rejections in target-absent lineups) and four types of error (false rejections and foil identifications Type α in target-present lineups and foil identifications Type β and false identifications in target-absent lineups) was used. Foil identifications Type α occur only when the suspect is guilty, whereas foil identifications Type β and false identifications occur only when the suspect is innocent. Foil identifications Type α or β are both "known errors" in that the legal system knows in advance who the foils are (Wells & Turtle, 1986), whereas false identifications are "unknown errors." Because the data were categorical, separate log-linear analyses were carried out on each measure and for each lineup as a function of age of suspect, age of witness, and sex of witness. The analysis of correct identifications in target-present lineups revealed no main effects or interactions on Lineup 1 or Lineup 2. The correct

Table 1. Mean Proportion Correct Responses and Errors in Lineup 1 and Lineup 2 as a Function of Age of Witness and Age of Suspect[a]

	Lineup 1				Lineup 2			
	Adult witness		Child witness		Adult witness		Child witness	
Identification decision	Adult suspect	Child suspect	Adult suspect	Child suspect	Adult suspect	Child suspect	Adult suspect	Child suspect
Target present								
Correct identifications	.08 (1)	.42 (5)	.33 (4)	.50 (6)	.25 (3)	.50 (6)	.42 (5)	.33 (4)
Foil identifications Type α	.25 (3)	.25 (3)	.42 (5)	.42 (5)	.42 (5)	.25 (3)	.33 (4)	.58 (7)
False rejections	.67 (8)	.33 (4)	.25 (3)	.08 (1)	.33 (4)	.25 (3)	.25 (3)	.08 (1)
Target absent								
Correct rejections	.67 (8)	.25 (3)	.42 (5)	.08 (1)	.67 (8)	.25 (3)	.42 (5)	.08 (1)
Foil identifications Type β	.17 (2)	.42 (5)	.58 (7)	.75 (9)	.25 (3)	.42 (5)	.58 (7)	.75 (9)
False identifications	.17 (2)	.33 (4)	.00 (0)	.17 (2)	.08 (1)	.33 (4)	.00 (0)	.17 (2)

[a] Frequencies are in parentheses.

rejections analysis in target-absent lineups revealed a main effect of age of suspect for both Lineups 1 and 2, (.54 vs. .17, χ^2 (1, n = 48) = 6.33, $p < .01$ for both) showing that more correct rejections were made in target-absent lineups composed of adult photos than those composed of child photos. There were no other main effects or interactions.

Turning to the errors, there were no main effects or interactions for false identifications or foil identifications Type α in Lineups 1 or 2. For foil identifications Type β there was a main effect for age of witness in both Lineup 1 (.67 vs. .29, χ^2 (1, n = 48) = 5.90, $p < .01$) and Lineup 2 (.67 vs. .33, χ^2 (1, n = 48) = 4.64, $p < .05$): Children made significantly more such foil identifications than adults. With false rejections there was a main effect of age of witness (.50 vs. .17, χ^2 (1, n = 48) = 5.08, $p < .05$) in Lineup 1 but not in Lineup 2. In the former case children made fewer false rejections than adults.

Overall Choice Responses

Choice behavior was specifically examined because it reflects the response biases of eyewitnesses. Choices are defined as the total number of lineup members chosen whether they were correct identifications or not. Thus, they include correct identifications, foil identifications Type α and β, and false identification errors, but not correct and false rejections. An age of Witness × Age of Suspect × Type of Lineup × Sex of Witness log-linear analysis of Lineup 1 choice behavior revealed a main effect of age of witness, χ^2 (1, N = 96) = 6.59, $p < .01$, and a main effect of age of suspect, χ^2 (1, N = 96) = 8.81, $p < .01$. Children are more likely to make choices than adults, and more choices were made with child lineups than adult lineups. There were no other main effects or interactions. A similar analysis on Lineup 2 choice behavior yielded a significant main effect of age of suspect, χ^2 (1, N = 96) = 5.98, $p < .01$, and a marginal main effect of age of witness, χ^2 (1, N = 96) = 2.64, $p < .10$. Again, there were no other main effects or interactions.

Reliability of Testimony

Change in Lineup Choice

To determine the stability of choice, an Age of Witness × Age of Suspect × Type of Lineup × Sex of Witness log-linear analysis was carried out on the change in choices from Lineup 1 to Lineup 2. This analysis failed to yield any significant main effects or interactions. Changes involving the no-choice alternative were then examined separately. Adults made seven such changes, whereas children made none of these changes. A log-linear analysis on such changes showed that this difference was statistically significant, χ^2 (1, N = 96) = 3.90, $p < .05$.

A point-biserial correlation of change with accuracy was carried out to determine whether subjects who changed their responses were more likely to have been incorrect on Lineup 2 than those who did not change their responses. However, there was no relationship between accuracy and change of response, r = $-.11$, $p > .05$.

Confidence Ratings

There were no differences in absolute confidence levels for child and adult witnesses nor child- and adult-suspect lineups. The major findings of interest involved changes in confidence from Lineup 1 to Lineup 2. Child witnesses showed an increase in confidence from Lineup 1 to Lineup 2, and child-suspect lineups were rated with higher confidence on Lineup 2 than Lineup 1. An Age of Witness × Sex of Witness × Type of Lineup × Age of Suspect × Time of Lineup analysis of variance showed a significant main effect of time of lineup with higher confidence on Lineup 2 than Lineup 1, $F(1,80) = 5.95, p < .05$. This main effect is qualified by two significant interactions: the Time of Lineup × Age of Witness interaction, $F(1,80) = 11.67, p < .001$, and the Time of Lineup × Age of Suspect interaction, $F(1,80) = 5.95, p < .05$. A test of the simple main effects of the former interaction showed that there was no change in confidence level across Lineups 1 and 2 for adult witnesses, $F < 1$, whereas there was a significant increase in confidence from Lineup 1 to Lineup 2 for child witnesses, $F(1,80) = 17.14, p < .001$. A test of the simple main effects of the Time of Lineup × Age of Suspect interaction failed to find any differences in confidence level across lineups with adult suspects, $F < 1$, but a clear increase in confidence across lineups with young suspects, $F(1,80) = 12.31, p < .001$.

In order to examine the confidence–accuracy relation, point-biserial correlations were conducted on identification accuracy and confidence level. Accuracy is defined as an identification of the suspect in a target-present lineup and a correct rejection in a target-absent lineup. For both Lineups 1 and 2, the overall correlation failed to reach significance, $r = .03, p > .05$ and $r = -.08, p > .05$, respectively. A breakdown by type of lineup also failed to demonstrate any evidence of correlations in target-present lineups (r's $= -.10$ and $.01$, p's $> .05$ for Lineups 1 and 2, respectively) or target-absent lineups, (r's $= .13$ and $-.15$, p's $> .05$ for Lineups 1 and 2, respectively).

Wells and Lindsay (1985) point out that overall correlations of accuracy and confidence that include the two types of accuracy responses (correct identification and correct rejection) and the four types of errors (false identification of suspect, false rejection, foil identification Type α, and foil identification Type β) are of little utility from the forensic perspective. Rather, they recommend an analysis of whether accurate identifications are made more confidently than false identifications; and, likewise, correct rejections are made more confidently than false rejections. Foil identification errors are known errors and are thus removed from these analyses. Point-biserial correlations conducted on correct and false identifications with confidence rating failed to yield significant correlations either on Lineup 1, $r = .00, p > .05$, or on Lineup 2, $r = -.03, p > .05$. Likewise, a similar correlational analysis on correct and false rejections with confidence ratings also failed to yield significant correlations on Lineup 1, $r = -.11, p > .05$ or on Lineup 2, $r = -.15, p > .05$.

Point-biserial correlations were also conducted on choosing rates and confidence level. Again, there was no evidence of a correlation on Lineup 1, $r = -.16$, $p > .05$, or on Lineup 2, $r = .05, p > .05$.

Objective Questions

The 10 multiple-choice questions included 5 central questions and 5 peripheral questions. An Age of Witness × Sex of Witness × Age of Suspect × Question Type analysis of variance on total correct yielded a main effect of question type, $F\ (1,88) = 77.58$, $p < .001$, with central questions answered significantly more correctly than peripheral questions. There were no other main effects or interactions.

The number of "don't know" choices made on the objective questions was also subjected to an Age of Witness × Sex of Witness × Age of Suspect × Question Type analysis of variance. There was a significant main effect of age of witness, $F\ (1,88) = 14.14$, $p < .001$, and of question type, $F\ (1,88) = 30.66$, $p < .001$. Adults made more "don't know" choices than children, and there were more "don't know" choices with peripheral than central questions.

To determine whether there was a relationship between photo identification accuracy and performance on the objective questions, point-biserial correlations of identification accuracy with central- and peripheral-question accuracy were conducted for both Lineups 1 and 2. For both lineups, accuracy on photo identification showed no overall correlations with performance on either the central or peripheral questions, all $r < .10$, $p > .05$. Point-biserial correlations were then computed separately for child and adult witnesses, male and female witnesses, target-present and absent lineups, and child and adult suspects. These analyses yielded a positive relationship with Lineup 1 identification accuracy and peripheral-question accuracy for young witnesses, $r = .28$, $p < .05$, and for target-present lineups, $r = .33$, $p < .05$. All other correlations were nonsignificant.

The relationship of photo identification choice responses with central- and peripheral-question accuracy was also examined by computing point-biserial correlations. For central-question accuracy there was no correlation with choice for either Lineup 1 or 2, $r = .06$, $p > .05$. However, there was an overall positive relationship between choice response and peripheral-question accuracy on Lineup 1, $r = .21$, $p < .05$, although this relationship just missed significance on Lineup 2, $r = .18$, $p < .08$.

DISCUSSION

The major results of the present study are readily summarized within the context of witness decision criteria and sensitivity. The photo identification choice data show that child witnesses make more overall choices than adult witnesses. Because choice data reflect decision criteria, we must conclude that child witnesses have more lax criteria than adult witnesses and are more likely to guess. There are probably a number of factors that contribute to this increased guessing behavior by child witnesses. Children may be more likely to assume that the target must be in the lineup especially with an adult authority figure presenting the photospread. Likewise, the task demands of the simultaneous presentation lineup may have exerted greater pressure to choose a photo for children than adults.

Social factors as well as cognitive factors (see Ceci, Ross, & Toglia, 1987b) most likely play a role in this behavior, and further studies are needed to determine how these factors contribute to the child witness's propensity to guess in the eyewitness situation.

An examination of the accuracy data allows us to determine how these additional choice responses are distributed by child witnesses. On Lineup 1 target-present lineups, children made significantly fewer false rejections than adults, and their extra choices were distributed over both correct identifications and foil identifications Type α. Although an examination of Table 1 suggests that children make more correct identifications and foil identifications Type α than adults, these differences were not statistically significant (.42 vs. .25, $p < .26$ for both). On Lineup 2 there was no longer a significant age difference in false rejections, and correct identifications were now clearly the same for both age groups. It appears that the child witness's sensitivity is not seriously impaired in the target-present lineups of this study.

It is not possible to demonstrate the lax criterion of child witnesses in studies using the forced-choice paradigm (Marin et al., 1979; Parker et al., 1986) because in that paradigm, both children and adults are forced to guess, camouflaging any natural tendency for children to guess more than adults. Studies using the optional forced-choice paradigm (Davies et al., 1988; Goodman & Reed, 1986; Goodman, Hepps, & Reed, 1986; Goodman, Aman, & Hirschman, 1987; King & Yuille, 1987; Yarmey, 1988) have typically found comparable levels of correct identifications across age groups with the exception of the inferiority of preschoolers. However, most of these studies (Goodman & Reed, 1986; Goodman, Aman, & Hirschman, 1987; King & Yuille, 1987; Yarmey, 1988) have either collapsed false rejections and foil identifications or failed to report relevant data, so that the stricter criterion used by older witnesses is not evident. On the other hand, Yarmey did report significantly more foil identifications Type α for his younger witnesses and Goodman, Aman, and Hirschman also found a trend in that direction similar to the present study. Davies et al. found no differences in correct identifications, false rejections, or foil identifications Type α in their study comparing witnesses from 7 to 12 years old. This failure to find any differences may be due to the particular constricted age range tested by these investigators.

In target-absent lineups, we had expected developmental differences to emerge in the number of correct rejections. Although there appears to be an age superiority in correct rejections in both Lineups 1 and 2, it never reached statistical significance (.46 vs. .25, $p < .17$ for both lineups). Age superiority in correct rejections was found in Davies et al.'s (1988) study comparing older children (11–12 years old) with younger children (7–8 years old). However, Yarmey (1988) found no significant differences in correct rejections from 6-year-olds to adults. Clearly the variables that influence the level of correct rejections across age need to be investigated. In the current study, the guessing tendency of children was reflected in greater foil identifications Type β but not in false identifications. Forensically, foil identifications are not serious errors because they are "known errors." In other words, the identification of a foil does not result in charges being brought against the identified person. Firm conclusions cannot be made regarding developmental differences in false identifications because the frequency of such errors is very low. As previous studies have collapsed both error types in the target-absent lineup, direct comparisons cannot be made with the present study. Davies et al. and Yarmey found that the combined errors were similar across the age ranges examined in their studies.

In summary, children indeed have a greater propensity to guess, but the impact of this behavior on sensitivity is minimal.[1] Nevertheless, the accuracy difference in target-absent lineups is worthy of some attention since children consistently (across both Lineups 1 and 2), although not significantly, make fewer correct rejections than adults. In target-present lineups the nonsignificant elevation of correct identifications in Lineup 1 for child witnesses is of only marginal interest because it washes out on Lineup 2 and is inconsistent with the literature. Thus, the strong evidence for guessing behavior in children and the suggestion that guessing could impact on accuracy scores (particularly correct rejections) warrant caution and vigilance in interpreting child witness identifications. It is possible that increased power might render some of the marginal findings significant. Furthermore, certain variables such as similarity of lineup members might sway the balance and cause a preponderance of the extra choice responses to move to the forensically critical alternatives.

Age of suspect data show that eyewitnesses of both ages are more likely to choose or guess when presented with child lineups. This increased guessing reduces correct rejections and shows a tendency toward an increase in correct identifications. There is no ready explanation for the lax decision criteria with child-suspect lineups, and because there are only two targets and two target substitutes at each age of suspect level, the conclusions that can be drawn from the data are limited. Nevertheless, it is noteworthy that once again there were no interactions of age of witness with age of suspect, consistent with Parker et al.'s (1986) findings of no cross-age or own-age preferences in eyewitness identification. The age of suspect findings in the present experiment suggest prudence in interpreting identifications of child criminals and clearly point to the need for further experimentation on this variable.

Consistency of response is critical to the judicial system, especially because the typical case involves repeated questioning before numerous persons (e.g., attorneys, police, judge, social workers, and peers). Changes in identifications from Lineup 1 to Lineup 2 address this question and in the present study show a similar number of changes across age. On the other hand, Parker et al. (1986) observed a greater number of changes for children than adults in the forced-choice paradigm. This apparent discrepancy is readily explained by the fact that in the optional forced-choice paradigm adults make significantly more change responses involving the no-choice alternative than do children. The propensity for this type of change by adults neutralizes the earlier finding of greater changes with children.

[1] An application of Flexser and Parker's (1986) signal detection analysis to Lineup 1 data revealed that a fit in which child and adult witnesses had the same d' (sensitivity) but different β (criteria) did not differ significantly from the observed scores, χ^2 (3) = 2.16, $p > .50$.

It appears that the strong commitment effect exhibited by adults in Parker et al. is not an issue when the no-choice alternative is available.

Jurors and the legal system tend to believe that witnesses who change their minds are less credible than those who are consistent on repeated testing. However, there is no evidence of a correlation of response change with incorrect response for either adults or children in this experiment. This appears to be another case where the juror's intuitive beliefs are inconsistent with research evidence (Wells, 1984).

Stability of choice was also looked at through confidence ratings. When only one lineup test was made, both adult and child witnesses showed similar levels of confidence. With a retest, however, different levels of confidence emerged, with child witnesses increasing in confidence over adult witnesses, and all witnesses increasing in confidence with child-suspect lineups. Such heightened levels of confidence on a second test have been observed by Hastie, Landsman, and Loftus (1978), who found that urging adults to guess about an object led to increased levels of confidence on a repeat question about the object. The confidence level results in the present experiment are consistent with these data in that higher confidence levels were observed on a second test in situations that were preceded by high levels of guessing on a first test (i.e., child witnesses and child-suspect lineups).

These observations are of import forensically especially because there were no concomitant increases in accuracy. As the United States Supreme Court's recommendations (*Neil v. Biggers,* 1972) and lay intuition (Wells, 1984) both claim that eyewitness confidence is a good indicator of eyewitness accuracy, it is of definite concern that confidence levels increased with repeated testing. We now have further evidence to support Whipple's (1909) early contention that we should "reduce the number of times that witnesses are called upon to testify." This recommendation appears to be particularly valid with child witnesses and with all witnesses who are identifying child suspects.

Eyewitness confidence is used in the legal profession as a predictor of accuracy, but the psychological literature is not supportive of these contentions (Bothwell et al., 1987; Deffenbacher, 1980; Leippe, 1980; Wells & Lindsay, 1985; Wells & Murray, 1984). In the present experiment, correlations of confidence and accuracy were nonexistent regardless of the breakdown. Although Wells and Murray suggest that one is more likely to find significant correlations in target-present lineups than in target-absent lineups, there was no such evidence in the present experiment. The eyewitness accuracy–confidence relationship once more appears of little use forensically.

As choice behavior has been considered more theoretically relevant than accuracy data (Malpass and Devine, 1984), correlations of confidence ratings and choice responses were also examined. There was no evidence of such correlations for either Lineup 1 or Lineup 2 consistent with several studies in the literature (Cutler, Penrod, & Martens, 1987; Fleet, Brigham, & Bothwell, 1987; Murray & Wells, 1982). However, others have found positive correlations (Malpass & Devine, 1981) or negative correlations (Hosch, Leippe, Marchioni, & Cooper, 1984). Clearly the confidence/choosing relationship requires further investigation.

An examination of accuracy of response on the objective questions shows a comparability across age groups. Central questions were answered better than peripheral questions for both children and adults. This is consistent with Goodman, Aman, and Hirschman's (1987) finding that central information questions are answered more accurately than peripheral information questions regardless of age. Although Parker et al. (1986) observed a similar central question superiority with adults, they did not find a difference across questions for children. In the present study, central questions involving descriptive statistics (e.g., age and weight) were eliminated from the pool of central questions. It may be that the child witnesses in the Parker et al. study were poorer than adults at estimating age and weight and so suffered a suppression of the descriptive or central questions. This hypothesis is consistent with Davies et al.'s (1988) finding that accuracy on height, weight, and age questions improved steadily with age. As Johnson and Foley (1984) point out, children perform as well as adults on memory tasks in which they have the requisite prior knowledge but are at a disadvantage when adults have more prior knowledge.

As with photo identification, children did demonstrate a greater guessing tendency than adults on the objective questions. The adult performance once more reflects a more stringent criterion with significantly more "don't know" choices than the child performance. Scogin and Calhoon (1986) also observed that their old-old subjects ($M = 81$) were more likely to give "don't know" responses to multiple-choice questions than their young-old participants ($M = 68$). These combined results suggest that subjects may become more cautious in their responding throughout the whole lifespan.

Intercorrelations among the dependent measures of identification accuracy and central- or peripheral-question accuracy were carried out to determine whether research supports the contention of the U.S. Supreme Court and of mock jurors (Wells & Leippe, 1981) that eyewitness identification should be discredited if there are concomitant errors in peripheral detail recall. Wells and Leippe (1981) and Cutler et al. (1987) both found evidence for negative correlations of identification accuracy and peripheral detail recall. On the other hand, Pigott and Brigham (1985) found no relationship between description and identification accuracy of the target, whereas Wells (1985) found evidence for a positive correlation but attributed it to characteristics of the particular target faces. In the present experiment, there were no overall correlations of identification accuracy with either peripheral- or central-question accuracy. Although the failure to find overall correlations favors the rejection of the Supreme Court's contentions, in certain situations (target-present lineups or child witnesses) positive correlations of identification accuracy with peripheral-question accuracy did emerge. Clearly, further research must explicate the conditions under which positive, negative, or no correlations will occur.

Correlations of the choice data with central- or peripheral-question accuracy revealed that memory for peripheral detail was significantly correlated with choice responses. This finding is consistent with both Wells and Leippe (1981) and Cutler et al. (1987). As Cutler et al. point out, this suggests that subjects base their decisions to choose a lineup member on their ability to recall peripheral information about the crime.

In conclusion, the results of the present experiment clearly show the pervasive nature of children's guessing behavior. This increased propensity to guess does not appear to seriously alter the child witness's sensitivity, although there was a trend toward reduced accuracy of child witnesses in target-absent lineups. With objective questions the number of correct responses was comparable across age groups, but more "don't know" choices were made by adults. Thus, the data point to a more lax decision criterion for children across response measures.

APPENDIX

Central Questions

1. Was the person who stole the radio wearing
   regular glasses ___ no glasses ___ sunglasses ___ don't know ___
2. Was the person who stole the radio wearing
   jacket ___ sweater ___ shirt ___ don't know ___
3. What did the thief put the radio in?
   bag ___ picnic basket ___ suitcase ___ don't know ___
4. Was the person who stole the radio wearing
   shorts ___ long pants ___ suit ___ don't know ___
5. What color hair did the person have who stole the radio?
   blond ___ red ___ brown ___ don't know ___

Peripheral Questions

1. What were the people drinking?
   milk ___ soft drinks ___ juice ___ don't know ___
2. What color was the blanket upon which the radio sat?
   pink ___ yellow ___ blue ___ don't know ___
3. What color was the frisbee that the people were throwing?
   red ___ yellow ___ white ___ don't know ___
4. Who was wearing the hat?
   boy ___ girl ___ no one ___ don't know ___
5. What color of flowers were on the bushes in the background?
   red ___ yellow ___ pink ___ don't know ___

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