Young Eyewitnesses: An Examination Of Young Children's Response Accuracy To Target Present And Target Absent Lineup Arrays Following Training Procedures

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Dedications

This dissertation is for the children. I hope it may, in some way, make a difference.

This dissertation is dedicated to my family, who make a difference in my life every day.

To my fiancé, John Iorio. May our future together be filled with adventures, challenges, dreams, successes, and love.

To my grandparents:

Ruby Huneycutt. I treasure your cards and letters and your willingness to share your experiences and stories. May the wishes that you sent me this past Christmas come true for both of us: live, laugh, love. I love you.

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Abstract

Young Eyewitnesses: An Examination Of Young Children's Response Accuracy To Target Present And Target Absent Lineup Arrays Following Training Procedures

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The Young Eyewitnesses research study examined the relationship between lineup type (Lineup Present, Lineup Absent), experimental condition (Training, Control) and response accuracy (correct, incorrect, and Don't Know responses) for children ages 3 years through 8 years. Children watched a video depicting a picnic scene in which a woman steals a camera. After a distractor task, children were provided with general instructions and demonstrations regarding lineups, including specific instructions about Don't Know and Not Here response options. The children assigned to the training condition then made identifications from six lineup arrays of photographs of men. The rest of the children engaged in a card game (using the photographs of the men). All children then viewed the main lineup array, consisting of six photographs of women, a Don't Know card, and a Not Here card. Children's comprehension monitoring was assessed through a referential communication task. Lineup type had a significant effect on accuracy when response accuracy was measured at three levels (correct, incorrect, and Don't Know) but not when accuracy was collapsed to two levels (correct, incorrect). Training had no impact on response accuracy within the Lineup Present condition; it neither increased nor decreased the proportions of correct responses. In the Lineup Absent condition, there was a significant effect of training on response accuracy. The proportion of correct responses was significantly higher for children in the Training group as

compared to those in the Control group. In the Lineup Absent condition, there was a significant interaction between response accuracy and age (coded as a dichotomous categorical variable, with children ages 3 years through 5 years as one level and children ages 6 years through 8 years as the other), with the proportion of correct responses for the younger children significantly greater than the proportion of correct responses for the older children. Training did not have any observed negative impact on identification responses and, in the Lineup Absent condition, improved response accuracy. Implications for police and other personnel involved in working with child eyewitnesses and suggestions for continued research are discussed.

Chapter 1: Introduction and Literature Review

Children have, for a number of reasons, increasingly become active participants within the criminal justice system. One factor underlying children's increasing involvement is that there is more pressure to prosecute child abuse, both sexual and physical, and a rise in the number of trials that involve allegations of child sexual abuse (King & Yuille, 1987; Penrod, Bull, & Lengnick, 1989; Cashmore & Bussey, 1996). A result of the increase in child abuse allegations has been a concomitant increase in the numbers of children asked to present court testimony (Penrod, Bull, & Lengnick, 1989; Woolard, Reppucci, & Redding, 1996; Lindsay, Pozzulo, Craig, Lee, & Corber, 1997). Children may be victims and/or witnesses to a variety of other types of crimes in addition to child abuse (Goodman & Reed, 1986). A second factor underlying the increasing numbers of child witnesses is the reduction in limitations placed upon child witnesses: competence requirements have been reduced and requirements for corroboration of and warnings about children's testimony have been reduced or eliminated (Cashmore & Bussey, 1996; Goodman & Reed, 1986). A third factor is the expansion in recent years of research into the capabilities of and beliefs about child witnesses, including young children, and research findings that have dispelled some of the previously held views that child witnesses were neither reliable nor accurate. (Gross & Hayne, 1996; Cashmore & Bussey, 1996; King & Yuille, 1987).

Eyewitness evidence in general is not only accepted but valued by the legal system (e.g., Goldstein, Chance, & Schneller, 1989; Brigham, J. C. & WolfsKeil, M. P., 1983.[1]) One of the roles of a witness is often that of

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1 Brigham and WolfsKeil noted that their survey results indicated that defense attorneys felt that eyewitness identifications are "overemphasized" by judges and juries (1983).

identification: recognizing and identifying a suspect (Beal, Schmitt, and Dekle, 1995). Even where children are not required to present testimony in court, they may provide police with critical information that is important in the crime investigation and in decisions concerning whether to prosecute the case (Goodman & Reed, 1986). Witnesses to crimes are often asked to view a lineup of suspects to assist the police and the prosecution in determining whether the perpetrator of a crime is the suspect under investigation or in custody. Photographic identification is used at different stages in a criminal investigation. It may be used to assist police in identifying a suspect who is not yet in custody; for trial preparation; and for identification when a suspect is in custody, a practice that Loh (1984, p. 561, citing Sobel, 1982) notes has been criticized but one that is accepted as a general rule by lower courts (Loh, 1984). Sobel (1981) describes the use of photo identification procedures at three stages: investigation, custody, and the "defendant stage" (Sobel, 1981, Section 5:1). The investigation stage refers to the use of photographic procedures to assist in identifying the suspect (Sobel, 1981, Section 5:2). When a suspect is in custody, Sobel argues that a "corporeal lineup" is available and should be used. However, most courts permit the use of photo procedures (Sobel, 1981, Section 5:3). Sobel also expresses concerns against use of photo procedures after a defendant has been charged (the custody stage), noting specifically that among the concerns is that there is no right to counsel at "photographic identification procedures" (Sobel, 1981, Section 5:4, citations to legal cases omitted). For practical and methodological reasons, most eyewitness research is conducted using photographic identification procedures. Wells and Seelau (1995) note that photospreads are employed as frequently as live lineups and "hold up" in court as well as live lineups do (p. 766).

Lineup Identifications and False Positive Identifications

Lineup identifications are given great importance by both investigators and by juries. A group known as the Devlin committee examined all lineups (known in the British Isles as identification parades) conducted in England and Wales in 1973 and published their findings in a report known as the Devlin Report (Devlin, 1976, as cited in Loftus, 1979). Among the 2,116 lineups conducted, a suspect was identified in 45% (approximately 952). After being identified, 850 people were prosecuted (Devlin, 1976, as cited in Loftus, 1979). Therefore, approximately 89% of those identified were prosecuted. Among this group, the prosecution proceeded against 347 people when the only evidence against them was identification by either one (169 cases) or more (178 cases) eyewitnesses. Seventy-four percent of the 347 individuals were convicted. Loftus (1979) noted that this high percentage (74%) is indicative of the influence of eyewitness testimony when no other evidence is available. Loftus also noted that juries have accepted eyewitness testimony even when there is greater evidence of innocence (Loftus, 1979). Juries place great weight on positive eyewitness identifications during deliberations and in conviction decisions (Wells, 1993, cited in Dekle et al., 1996; Loftus, 1979; see also Wells, 1993).

The above hints at a problem that may extend far beyond isolated examples. A growing and substantial body of evidence from laboratory studies, field studies, and from the criminal justice system supports the conclusion that eyewitnesses frequently make mistakes (e.g., Goldstein, Chance, & Schneller, 1989; Pynoos & Eth, 1984; Connors, Lundregan, Miller, & McEwen, 1996). Concerns that false identifications could lead to wrongful convictions have been shown to be justified. "We must regard wrongful conviction as the gravest of errors that can occur in our system of justice" (Rattner, 1988, p. 284).

For example, a man who was identified from a group of photographs in 1984 served ten years of his sentence for rape, kidnapping, and robbery; in 1994, he was released from prison after a DNA test proved that he did not commit the crime. (Wells & Seelau, 1995). In Jones v. City of Grand Prairie (1999), a man brought a lawsuit after he was arrested and incarcerated following investigation as a suspect in the abduction and rape of a four-year-old boy. Soon after the child went missing, his mother found the boy, crying and injured. He provided conflicting descriptions of his assailant and described the assailant's vehicle. Subsequently, the child identified the man as his assailant from a photographic lineup array of six men. The man was incarcerated for 18 months; five months after he was released on bail, the prosecution dropped the charges following DNA analysis, which apparently excluded the man as the source of semen samples taken from the child's body during the medical examination. Jones v. City of Grand Prairie (1999).

Analyses involving larger numbers of cases and defendants have only confirmed what was illustrated in the above example. Wells (1993), referencing the work of numerous other researchers, stated that "[a]nalyses of what went wrong in producing more than 1,000 convictions of innocent people have revealed that the single largest factor leading to these false convictions was eyewitness error" (p. 554). Multiple analyses have been consistent in the finding that "mistaken eyewitness identification is the single largest source of wrongful convictions." (Wells & Seelau, p. 765).

Rattner, in what he described as an exploratory study, examined 205 criminal cases that met the following criteria: the cases took place after 1900, the cases resulted in conviction, and the defendant was later exonerated (1988).[2]

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2 Rattner's study did not include cases in which convictions were reversed on the basis of legal error, such as denial of due process. (Rattner, 1988). It is also important to note,

Twenty-one (approximately 10%) of the defendants in this sample had in fact been sentenced to death.[3] Rattner also reported findings similar to his from a study conducted in England by Brandon and Davies (1973) (as cited in Rattner, 1998). Brandon and Davies identified 70 wrongful convictions between 1950 and 1970 and found in their analyses that identification errors were among the most frequently occurring errors (as cited in Rattner, 1988). In his review of the types of errors involved in cases, both those in his sample and from other works, Rattner emphasized that multiple factors were usually involved (1988). However, in his analysis of the types of errors involved in the cases in his sample, Rattner found that eyewitness misidentifications were the most common errors, occurring in 100 cases (approximately 49%).[4] Rattner was not able to discern the context of the misidentifications, such as whether the witness had been subject to any pressure or suggestive procedures; whether the identification was same-race or cross-race; or the conditions under which the witness interacted with the defendant (Rattner, 1988).

In August 1999, the results of DNA testing had established that 67 people had been convicted and sent to prison, and some to death row, for crimes that they had not committed (Scheck, Neufield, and Dwyer, 2000, p. viv). Scheck, Neufield, and Dwyer (2000) stated that the leading cause of wrongful imprisonment is "eyewitness error" (p. xvi). Out of 62 cases in which the

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as Rattner discussed, the cases in his sample are not representative of all cases of wrongful conviction. Over 46% of the cases in his sample took place between 1920 and 1939 (Rattner, 1988). The three most frequently occurring crimes in Rattner's sample were murder, robbery, and forcible rape (Rattner, 1988).

3 Either the sentence was commuted to life in prison, during which time the defendant was exonerated and released, or the death sentence had not yet been carried out before exoneration (Rattner, 1988).

4 Other types of errors reported by Rattner included witness perjury, negligence by officials within the criminal justice system, and coerced confessions (1988).

accused was found to have been wrongly convicted, Scheck, Neufield, and Dwyer reported that eyewitness error was a factor in 52 of them (Scheck, Neufield, and Dwyer, 2000, Chart, Appendix 2).

As Loftus has stated, "[m]isidentifications create a double horror: The wrong person is devastated . . . and the real criminal is still out on the streets . . . " (Loftus, 1993; see also Wells, 1993). The true rate of false identifications in legal proceedings cannot be determined or accurately estimated (Wells & Seelau, 1995; see also Loftus, 1993; Rattner, 1998). Wells (1993) stated that the "cases of false conviction were discovered to be false by rare and unpredictable events; hence, we do not know if they are representative of false convictions in general, and there might be no reliable way to make such a determination. Even if we knew that eyewitness error accounted for some constant percentage of all false convictions, say 55%, we would have no clear method for estimating the frequency of false convictions" (p. 554).

There are several reasons underlying the difficulty noted by the above researchers in estimating the rate of false identifications. False identification rates are not necessarily the same as, and are likely higher than, false conviction rates. As has been discussed, identifications (and therefore false identifications) occur at numerous stages in legal proceedings. False identifications at earlier stages, such as during investigation, may not be reported and accurate information on these types of identification may be difficult to obtain. Further, not every false identification leads to wrongful conviction. Even focusing only on cases of wrongful conviction, however, the true rate of false convictions (and involved identification errors) may, as Wells (1993) stated, remain beyond accurate estimation.

For cases of wrongful conviction to be studied, they have to be identified from among the numerous claims (both meritorious and non-meritorious) of

wrongful conviction that are made (and some that may not be made). Rattner (1988) discussed the challenges in creating a consistent definition for "wrongful conviction" cases to be included in analyses. He restricted his analyses to cases where the error had been officially recognized, not merely claimed (1988). When a claim for wrongful conviction is made, conclusive evidence (such as DNA evidence) is needed to establish the wrongfulness of the conviction.[5] It seems likely that continued research into wrongful conviction in cases in which there is DNA evidence (such as sexual assault cases), will increase the ability to more accurately estimate the rate of wrongful convictions in those types of cases. However, even in such cases, the DNA evidence has to exist; be appropriately preserved; analyzed; legal remedies pursued; and the results reported. Meanwhile, for numerous crimes, such as robbery, it is less likely that DNA evidence will be available to support or to contradict a claim of wrongful conviction. As a result, accurate estimates of the true rate of wrongful convictions remain difficult, if not impossible, to obtain.

While studies provide information regarding identification errors, some researchers hypothesize that, given the controlled nature of research studies, the rate of identification errors in research studies could be lower than the rate of identification errors that actually occur within the legal system (Goldstein et al., 1989). Goldstein and colleagues attempted to obtain information about the number of criminal cases in the United States in which eyewitness evidence was "of central importance" (p. 71). They noted a number of difficulties in obtaining information, including that cases are not identified based on type of evidence and that there is no national database of information from trial courts. Goldstein

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[5] Rattner listed bases for exoneration as evidence that was previously available but not utilized, evidence that was not previously available, or a confession by the perpetrator (1988). Wells et al. (2000) described the "exonerating power" of DNA (p. 589).

and colleagues surveyed district attorneys throughout the United States. Based on the 45 surveys that could be used in most analyses, they found that a median three percent (3%) of felony cases where there was not an admission of guilt (therefore not including cases that concluded with plea bargains) involved "crucial" eyewitness evidence (p. 72). Goldstein and colleagues concluded that, as a "rough estimate," approximately 77,300 people were arrested during one year based in some degree on eyewitness evidence.[6]

Role of Child Witnesses

The degree to which the eyewitness errors described above were made by child witnesses is unknown. Eyewitness errors, and their role in leading to wrongful convictions, cannot--and should not--be ignored by the legal system or by psychological research. These concerns must be balanced, however, against competing interests. While it is clear that eyewitnesses may make mistakes, it is also acknowledged that, particularly for certain crimes, eyewitness evidence may be the only evidence (e.g., Goldstein et al., 1989). And the only eyewitness may be a child. Again, psychological research, the legal system, and the media provide numerous examples. Unfortunately, these include recent examples of children who witnessed the abduction of child victims from their homes.

In July 2002, five-year-old Samantha Runnion was abducted from outside her home; her abduction, sexual assault and murder made national headlines. The witness to Samantha's abduction was her five-year-old best friend (Samantha mom: 'Little room for anger,' July 26, 2002). The description of the suspect (including information about speech patterns) and the sketch that were

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6 The authors multiplied the median percentage by the number of arrests for index crimes during the year 1986 (Goldstein et al., 1989, p. 73). In their discussion of the limitations of their research, the authors pointed to several factors that would lead to this estimate being low (Goldstein et al.).

released to the public by authorities were based upon information provided by Samantha's five-year-old friend (Police: Samantha's killer may bear signs of a struggle, July 18, 2002; see also Sheriff: '100 percent certain' suspect killed Samantha, July 19, 2002).[7] When Elizabeth Smart was abducted from her home, her younger sister was the only witness (O'Driscoll and Howlett, 2003, 2A).

In 1982, the Los Angeles County Sheriff's Homicide Division estimated that 10% (200) of the 2,000 homicides that took place within their jurisdiction "had a dependent youngster as a witness" (Pynoos & Eth, 1984, p. 88). The authors met with more than 40 of those children, who ranged in age from preschoolers to adolescents and for whom the assailants included parents, friends and relatives, and strangers (1984).

In 1983, a three-year-old girl was abducted, a crime witnessed by her four-year-old brother (Jones & Krugman, 1986). She was located 70 hours later. Five days after her abduction, the girl picked "the 'bad man'" from an array of six photographs. Five days after her identification, she viewed a videotaped lineup that included the suspect and four other men, who each spoke a set phrase; again, she identified the same man. Two weeks after her abduction, this child was again interviewed and at that time was shown a photographic lineup without the suspect in it, although it was "suggested" to her that the "'bad man'" was in fact in the group. The child indicated that he was not among the photographs (Jones & Krugman, 1986).[8] While the repeated presentation of lineups and the misleading nature of some of the lineup presentations raises

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[7] The suspect in Samantha Runnion's murder has been charged with sex crimes, murder, and kidnapping. His preliminary hearing is scheduled for July 2004 (Bickel, 2004).

[8] The interview continued with some continued variations in lineup presentation, including, presenting the child with the same photographs with the suspect's picture included (Jones & Krugman, 1986).

numerous concerns, the Jones and Krugman case study provides an example of the importance of a very young child's eyewitness identification and of a very young child's ability to provide an accurate identification.[9]

The increased presence of child witnesses, particularly the increase in reports of child victims of such crimes as child abuse, has led to the need to learn more about the credibility, and abilities, of child witnesses (Parker & Carranza, 1989; Goodman & Reed, 1986). Children may provide important information to police and may provide court testimony (Goodman & Reed, 1986). However, as Pynoos and Eth (1984) discuss, police may not recognize, understand, or adjust for the unique needs of child witnesses, resulting in conflicts that can have negative consequences for everyone (1984). As the legal restrictions on child witnesses have decreased and the presence of child testimony has increased, the importance of thoroughly and accurately understanding the capabilities of child witnesses has grown (Goodman & Reed, 1986).

Questions and doubts concerning the accuracy of child witnesses have been based largely on the issues of children's memory and suggestibility: many authors have discussed the oft-made assumptions that children have less accurate memories and are more subject to suggestion than are adults (e.g., Goodman & Reed, 1986; Brigham, Van Verst, & Bothwell, 1986). A number of researchers have noted the increased focus upon the eyewitness abilities of children (Peterson, Dowden & Tobin, 1999; Ricci, Beal, & Dekle, 1996; Melton & Thompson, 1987). Research studies have highlighted a discrepancy between the legal system's perceptions of young children's capabilities and the actual evidence of their capabilities.

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9 The suspect was charged with attempted murder, kidnapping, and sexual assault of a child. As part of a plea bargain, the suspect confessed 15 months after the abduction. His account of his sexual abuse of the victim was consistent with hers (Jones & Krugman, 1986).

Children Making Eyewitness Identifications

One of the roles of a witness is often that of identification: recognizing and identifying a suspect (Beal, Schmitt, and Dekle, 1995). Child witnesses may be called upon to make such an identification. For example, in Barber v. United States (1968), a nine-year-old girl and an adult witnessed a stranger sexually assaulting another child. The victim was unable to identify her assailant. Likewise, the adult could not. The nine-year-old testified at trial that she identified the defendant at a lineup five days after the incident. Barber v. United States (1968).[10] In Gray v. Rowley, (1979), the Court of Appeals for the Fifth Circuit described the "overwhelming" direct and circumstantial evidence against the defendant, including the identification by his victim: the nine-year-old girl described the appearance of her rapist, identified him in a lineup, and identified him while in court.

Although a great deal of research has examined children's memory for events, there has been less research focused upon the abilities of children to identify strangers (Lindsay et al., 1997). A number of factors may have led researchers to focus on areas other than identification of strangers. Child victim-witnesses are often the victims of crimes, such as kidnapping or sexual abuse, in which they have spent a large amount of time with the perpetrator (Gross & Hayne, 1996). In addition, child sexual abuse is most often perpetrated by people known to the child, so that questions of identification are somewhat rare (Davies, 1996). Nevertheless, identifications of people who may in fact be strangers are an important component of the legal process.

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10 In addition to other procedural issues, this case involved a dispute as to the identity of the assailant. The defendant testified that neither child identified him at the lineup and the prosecution presented no evidence from the police or other sources to resolve the question with regard to lineup identification. Barber v. United States, (1968).

Studies from international populations support the conclusion that children are often involved in identification of strangers. The results of a survey of cases brought to court in Wales and England, reported by Davies and Noon in 1991, indicated that 22% of defendants indicted for trial were in fact strangers to the child (as cited in Davies, 1996).[11] Identification processes are not limited to cases of stranger identification but may also be a tool for identifying a suspect when the person is known to a child but the child cannot provide a name.[12] Flin, Bull, Boon, and Knox (as cited in Davies, 1996) reported on a survey of juvenile witnesses in Scotland and emphasized that children may provide evidence in a wide variety of cases where identification is critical.

Research into Eyewitness Accuracy

Psychological research into eyewitness errors began in the 1970s (Wells et al., 2000). More than 2,000 publications had addressed the reliability of eyewitnesses by 1995 (Cutler and Penrod, 1995, as cited in Wells et al., 2000). There are numerous examples of studies with adult witnesses and varying rates of reported response accuracy. In a study conducted by Brigham, Maass, Snyder and Spaulding (1982), confederates served as customers who paid for purchases with pennies and then asked for directions. Overall, the 73 convenience store clerks who attempted to identify photographs of the "customers" (from lineup present arrays) had an accurate identification rate of 34 %, increasing to 47% when those who did not attempt an identification were excluded (Brigham, Maass, Snyder and Spaulding (1982).

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[11] It is unclear whether the cases involved child sexual abuse or a broader group of cases.

[12] For example, during a clerkship with the Family Court of the State of Delaware, this author observed part of a trial in a child sexual abuse case and, in discussions with Court staff, became aware that a lineup procedure had been employed. A lineup array was employed with a young child. The child was able to describe the suspect, who was known to her, in general terms, but could not provide a name.

One less scientific, but nonetheless illustrative, experiment was conducted in 1974 when television viewers watching a news show observed a simulated purse-snatch (Bartol, 1983). The incident lasted 12 seconds; the thief ran toward the camera for approximately two seconds. The viewers were presented with a lineup; were told that the thief might not be in the lineup; and were asked to call to report whether they recognized him. The lineup presented was a lineup present array. Of the 2,000 viewers who phoned, 14.1% made a correct identification; 1,843 made an identification error (Buckhout, 1975, as cited in Bartol, 1983).

The combined impact of the eyewitness research, expert testimony by psychologists concerning eyewitness issues, media coverage, and the "DNA exoneration cases" combined to spur action by the justice system (Wells et al., 2000). The "first set of national guidelines in the United States for the collection and preservation of eyewitness evidence " was published by the Department of Justice in 1999 (Wells at al., 2000). While the media and, in fact, some psychologists had put forth the idea that eyewitnesses were unreliable and that there was nothing that could be done to address the unreliablity, eyewitness research and, in particular, the researchers who worked on the guidelines focused on "system-variable research, namely, that some eyewitness errors are attributable to the procedures used to collect eyewitness evidence and, as such, are preventable errors" (Wells et al, 2000, p. 589).

System Variables

The processes of eyewitness memory, and eyewitness identifications, are the result of a number of factors (Steblay, 1997). A number of factors that influence the accuracy of an eyewitness identification have been explored through research. Such factors include age, gender, race, and developmental level. Some of these factors are "situational," such as temporal factors (the time a

witness has to observe an event; the rate of events); the varying significance of details, such as the presence of a weapon; and the degree of violence involved in the event (Bartol, 1983). The race of the perpetrator and the level of witness stress are additional examples of situational variables (Steblay, 1997). Wells termed such variables estimator variables (Wells, 1978, as cited in Steblay, 1997; Wells (1978)). Wells (1978) used this term since these variables cannot be controlled in actual crimes and investigations but can only be estimated. The impact of estimator variables on eyewitness recall can be estimated only by analysis after the fact (Steblay, 1997). At the time of eyewitness lineup identification, estimator variables are already in place and cannot be changed.

Wells referred to other factors as system variables (Wells et al., 2000). Wells (1978) applied the term "system variables" because these variables can be examined and knowledge about system variables may be applied by the criminal justice system (Wells, 1978). While estimator variables are not within the control of the justice system, system variables are (Wells et al., 2000). System variables include such factors as the nature of lineups and interrogation procedures (Steblay, 1997). Such factors are part of the task demands, such as the nature of the lineup; the nature of the questions asked; and the assumptions made by the child with regard to the interview task (King & Yuille, 1987). System variables, and task demands, are factors that can be influenced by investigators (Steblay, 1997). Steblay, citing 1995 work by Seelau and Wells, noted that researchers have begun to suggest that research focus upon system variables. Seelau and Wells have argued that "the reliability of eyewitness identification is significantly influenced by methods used to obtain the identification that are controllable by the criminal justice system" (p. 765-66).

Research into such variables could suggest possible changes in investigative procedures that could improve eyewitness evidence (Steblay, 1997;

King & Yuille, 1987). For example, if provided with appropriate information, law enforcement agencies could design and implement specific lineup procedures, such as training, that improve decision-making accuracy: maximizing accurate identifications while minimizing false identifications (Steblay, 1997). The system variable research has developed in two main areas: event memory and identification memory, which is the ability of an eyewitness to identify a suspect from either a photographic or live lineup (Wells et al, 2000, p. 582). As Wells described, "the development of a scientific literature on system variables was unique in being able to inform the justice system of ways to increase the accuracy of eyewitness statements in general and decrease the frequency of identification errors in particular" (Wells et al., 2000, p. 582). The Eyewitness Evidence: A Guide to Law Enforcement (United States Department of Justice, 1999) publication represents progress in this area. Wells et al. (2000) describes this publication as "the first set of national guidelines in the United States for the collection and preservation of eyewitness evidence for criminal cases" (p. 581).

With the potentially serious consequences of mistaken identification, there has been concern with, and a focus upon, approaches to evaluate and to reduce the problem of false identifications (Wells and Seelau, 1995). Given the increasing involvement of child witnesses, there has also been increased interest in determining whether young children have the ability to make accurate identifications (Beal, Schmitt, & Dekle, 1995). However, more research has examined adult eyewitness abilities than children's (Pozzulo & Lindsay, 1997).

Research Focused on Children's Eyewitness Abilities

Research investigating children's facial recognition has been more focused upon studying laboratory facial recognition than on studying identification by eyewitnesses (Parker & Carranza, 1989). Facial recognition studies differ

methodologically from eyewitness studies. Although facial recognition studies usually involve large groups of distractor as well as target photos, eyewitness studies often use lineups, recognition tests with one target photo and several distractor photos (Parker & Carranza, 1989). Further, laboratory facial recognition studies generally use only target-present lineup arrays (Gross & Hayne, 1996). In their 1986 article, Brigham, Van Verst, and Bothwell noted that laboratory studies conducted by other researchers seemed to support the assumption that children were less reliable witnesses than adults, as children were found to perform more poorly than adults on recall memory tasks as well as on facial recognition tasks. Parker and Carranza (1989) noted that most facial recognition studies have found that, as children get older, the number of their correct identifications increases. Eyewitness research has not found a similar gradual increase in accuracy with age and, in fact, many studies using photo identification did not find developmental differences, although some age differences have emerged (Parker & Carranza, 1989).

Brigham, Van Verst, and Bothwell, in 1986, found that the only study published at that time examining children's performance under conditions that "simulated a real eyewitness task" was the 1979 study by Marin and colleagues (Brigham, Van Verst, and Bothwell, p. 296). Brigham et al., however, also reported that no age differences in description accuracy or identification accuracy were found in the unpublished study by Cane, Finkelstein, and Goetz (1981) (as cited in Brigham et al., p. 296-97). Brigham and colleagues (1986) did not report the ages involved, or the specific methodology, of the purse snatching study conducted by Cane et al.

A trend has been seen in the eyewitness studies of preschool children: rather than a gradual increase as age increases, some studies have found that children under the age of six years have more difficulty with correct

identifications than do children over six (Parker & Carranza, 1989). Saywitz argues that a "simple relation between age and eyewitness performance" has not been found by the research (1987, p. 36). The memory development research does suggest, however, that the interaction between age and other factors, including task demands and situational factors, is critical in eyewitness memory performance (Saywitz, 1987).

Responses to Lineup Arrays

A witness who is called upon to view a lineup, whether it is a live lineup or a photo array, is of necessity viewing one of two possible lineup conditions. In a lineup present condition, the perpetrator is in fact in the lineup. In a lineup absent condition, the perpetrator is not among the choices presented. Wells and Seelau (1997) note that the greatest risks with respect to mistaken identification occur in a lineup absent situation. Errors in a target-present lineup can occur when the lineup is incorrectly rejected or when one of the foils is selected. As Beal and colleagues discussed, selection of a foil in a target-present lineup generally does not pose a risk of false arrest, given that the foils are known to the police; such an error, however, may well undermine the child's credibility. In a target-absent lineup, however, the risks increase. Errors may still lead to reduced credibility, as the child may select one of the foils. More serious, however, is the possibility that the child could make a false identification by selecting the innocent suspect, resulting in false accusation and a risk of false conviction (Beal, Schmitt, & Dekle, 1995).

The research into adult eyewitness identification performance, which is more extensive than that focusing on children, provides not only valuable information but also a framework for understanding the variables under investigation in the research on child witnesses. For all witnesses, a primary focus has been the study of methods through which accurate identifications can

be increased and false identifications reduced (Pozzulo & Lindsay, 1999; Wells et al., 2000). Within the adult eyewitness literature, the number of false positive identifications in lineup absent conditions decreases with no significant decrease in accurate identifications in target-present conditions when sequential, rather than simultaneous, lineups are utilized (Loftus, 1993). When witnesses are first presented with a lineup absent array and do not make an identification, they are then more accurate when subsequently viewing a lineup present (Loftus, 1993).

Some research studies included only lineup present arrays. Brigham, Van Verst, and Bothwell (1986) used six-person lineup present arrays, with the distractor photographs or foils chosen based upon similarity to the target.[13] One-hundred-twenty children (40 fourth-grade students, 40 eighth-grade students, and 40 eleventh-grade students) participated. The children participated in groups and observed a live staged theft; each child was then questioned individually, including both leading and nonleading questions about what had happened and about the "thief." Each child was presented with the photographic lineup and asked to identify the thief if he was there; the children were given the option of rejecting the lineup by not choosing any picture. Overall, 83% of the children responded correctly on the identification task by selecting the target photograph; 7% selected a foil; and 10% rejected the lineup. Brigham, Van Verst, and Bothwell (1986) reported that, in a univariate analysis, age significantly affected performance on the lineup identification task. Follow-up testing reflected that eighth-grade students and eleventh-grade students had similar performances on the lineup identification task and were more accurate than fourth-grade students (Brigham, Van Verst, & Bothwell, 1986). However, the statistics presented by these authors must be viewed with caution, as they

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[13] Brigham, Van Verst, and Bothwell (1986) reported a functional size of 8 and an effective size of 3.59 for their lineup.

reported using parametric statistics (including MANOVA) with dichotomous dependent variables (including lineup identification accuracy) (Brigham, Van Verst, & Bothwell, 1986).

In a review of studies concerning children's ability to make identifications, Parker and Ryan (1993) noted that children six years of age and older have been found to perform at rates comparable to adults with regard to the number of correct identifications, while preschool age children do not perform as well. Similarly, Gross and Haynes (1996) noted that children over five years of age perform comparably to adults when presented in lineup present conditions.

Research Including Lineup Absent Conditions for Child Witnesses

Research has begun to examine children's performance when presented with target absent lineups (Pozzulo & Lindsay, 1997; Gross & Haynes, 1996; Parker & Ryan, 1993; Beal, Schmitt, & Dekle, 1995; Dekle, Beal, Elliott, & Huneycutt, 1996).

King and Yuille, in a 1986 study, examined the accuracy of children in lineup present and lineup absent conditions in which the target was a stranger. Across the age groups, children made correct identifications 80% of the time in the lineup present condition. Ten percent made an incorrect identification. In the lineup absent condition, however, although the children were warned that the target picture might not be in the array and that they could reject the array, only 40.5% of the children correctly rejected the lineup array. The rate of false identifications differed among the age groups: children between eight and eleven years of age made an identification in the lineup absent condition 74% of the time while teenagers (13 and 14 years of age) did so 36% of the time (as cited in King & Yuille, 1987). Additional studies by Yuille et al. (1986) and by Davies et al. (1988) support the finding of poor performance in the lineup absent

condition and an effect of age, with younger children making fewer rejections of the array than older children (as cited in Davies, 1996).

The two different possible lineup conditions present different types of possible errors, the ramifications of which must be considered. Dekle et al. (1996) found that children and adults differed in their pattern of responding: in the lineup absent condition, children were more likely to err in making a false positive identification (choosing one of the distractor photographs). Across all conditions, adults were more likely to indicate that they were not certain (Dekle et al., 1996). In their discussion of research studies, Gross and Hayne (1996) noted that the general result in both lineup present and lineup absent conditions has been that children make more errors of commission than of omission. Dekle et al. (1996) noted that a number of researchers have found that, in a lineup absent situation, children are more likely than adults to select someone, even if given warnings that the perpetrator might not be there and when told that they do not have to choose anyone.

In the lineup present condition, there are two possible responses in addition to a correct identification or an error of commission (false identification). A witness may also indicate that the perpetrator is not there; researchers often define this error as an error of omission (Peters, 1991, p. 70; Gross & Hayne, 1996) or a false rejection (e.g., Yarmey et al., 1994). A witness may indicate that he or she does not know or is uncertain if the perpetrator is present (a Don't Know response); this may also treated as an error (Gross & Hayne, 1996; Ricci, Beal, & Dekle, 1996).

Researchers have further separated the possible responses to lineup arrays. Parker and Ryan (1993) and Parker and Carranza (1989) utilized the system of Wells and Lindsay (1985) (see also discussions in Parker & Ryan, 1993; Parker & Carranza, 1989). In this system, there are two categories of correct

responses (correct choice, lineup present; correct rejection, lineup absent) and four types of errors (false rejection or foil identification error, lineup present; false identification or foil identification error, lineup absent) (Parker & Carranza, 1989).[14] Therefore, in a lineup present condition, Yarmey and colleagues described the three types of errors that follow from Wells and Turtle's classification: correct identification, foil identification, or incorrect rejection (1994). Foil identification errors pose less risk, as they are known errors: investigators know who the foils are (Wells & Turtle, 1986, as cited in Parker & Carranza, 1989). Yarmey and colleagues, while noting that foil identifications may be "theoretical[ly]" relevant, described them as "forensically irrelevant" (Yarmey et al., 1994). False identifications, however, are " 'unknown errors' " (Parker & Carranza, 1989, p. 139). Parker and Carranza (1989) also examined choice behavior. Choice behavior is the "total number of lineup members chosen," regardless of whether the choice is correct (Parker & Carranza, 1989).

Table 1

Response options

	Lineup Present	Lineup Absent
Correct	Correct Identification	Correct Rejection
Incorrect	Foil Identification Incorrect Rejection	Foil Identification False Identification

14 The foil errors are sometimes referred to as foil identifications type Alpha and foil identifications type Beta. When the suspect is guilty, a foil error is an alpha error; when the suspect is innocent, the foil identification is a Beta foil error (Parker & Carranza, 1989).

Researchers have begun to analyze not just the correct responses but also the types of errors committed. Parker and Carranza (1989) presented children (9 years of age) and adults with a slide show of a simulated crime; they utilized both lineup present and lineup absent arrays. Response choice was examined as a function of age of suspect, age of witness and gender of witness. No main effects or interactions were found with regard to correct identifications in the lineup present conditions. Similarly, there were no main effects for false identifications (choosing the substitute photograph in lineup absent) or for foil identifications in the lineup present condition. Children were more likely to make foil identifications in the lineup absent condition than were adults. With regard to choice behavior, children were more likely than adults to make choices (Parker & Carranza, 1989). In the lineup present condition, the extra choices were reflected in both foil identifications and correct identifications. Comparisons of the children's correct and foil identifications in the lineup present condition with those of adults did not reveal a significant difference. In the lineup absent condition, children's tendency to guess resulted in more foil identifications but not more false identifications. No significant age differences were found between children's and adults' correct rejections (Parker & Carranza, 1989). Parker and Carranza (1989) concluded that, although children do have a tendency to guess, the impact of children's guessing behavior upon accuracy scores should be examined with caution.

Parker and Ryan (1993) presented adults and children (ranging in age from 8 years 1 month to 11 years, 1 month) with a slide show of a simulated crime. Across all conditions, there was no statistically significant difference for age, although it approached significance. An analysis of the target present lineups found no main effects in correct identifications but revealed a significant main effect of age for both types of errors (false rejections and foil

identifications), with children making more false identifications than adults but fewer false rejections (Parker & Ryan, 1993). An examination of choice behavior revealed that child witnesses made more choices than did adults (Parker & Ryan, 1993).

Lineup Response Options and Errors

In examining previous research, caution must be exercised in interpreting correct and false responses, as researchers have been inconsistent in defining which responses are included as errors. Ricci, Beal and Dekle (1996) did not analyze the different types of errors. For the lineup absent condition, a correct response was defined as a correct rejection of the lineup or as a Don't Know/not sure response. Gross and Hayne (1996), however, distinguished between errors of commission and of omission and defined a Don't Know response as an error of omission. Errors of omission were defined as a statement that the target was not present or a Don't Know answer in lineup present conditions and as a Don't Know response in lineup absent conditions (Gross & Hayne, 1996).

Many researchers report their findings in terms of the proportion of responses. However, there are other approaches for evaluating lineups. Lindsay, Lea, and Fulrod (1991) discussed the diagnosticity ratio. This ratio has been advocated by Wells and Lindsay (1980, 1985, as cited in Lindsay, Lea, and Fulrod) as possibly the "best indication of the potential value of a lineup technique as a source of evidence" (Lindsay et al., 1991, p. 743). Ratios are calculated for identifications (proportion of correct identification in lineup present / proportion of false identification in lineup absent) and for rejections (proportion of correct rejections in lineup absent / proportion of false rejections in lineup present) (Lindsay et al., 1991). "The higher the diagnosticity ratio, the greater the probative value of identification decisions from such lineups should be" (Lindsay et al., 1991, p. 743). The diagnosticity ratio permits comparisons of

identifications and rejections across lineup types, as both the correct/target photograph and the designated "suspect" are in lineup arrays with the same foil photographs (Lindsay et al., 1997). This ratio is also of interest when research is focused upon whether one technique or procedure is more successful in reducing false identifications, even when the "suspect" and the "target" are very similar in appearance (Lindsay et al., 1997, p. 394).

Lindsay, Pozzulo, Craig, Lee, and Corber (1997) expressed concerns with analyzing results from lineup present and lineup absent presentations within the same analysis. While responses can be categorized as correct and incorrect, "correct rejections are failures to choose anyone while correct identifications require selection of the target. Thus, choosing and accuracy are confounded. Different psychological processes may control these decisions" and, therefore, Lindsay and colleagues advocate analyzing identifications from the two types of lineup presentations separately (Lindsay et al., 1997, p. 396, footnote 3).

Lindsay and colleagues (1997) discussed the practice by researchers of identifying and focusing on a specific "suspect," most often chosen as the person in the lineup absent array who is most similar in appearance to the target. However, the authors point out that this may result in an overestimation of rates of false identification, as in the actual forensic context, the "suspect" may not be "highly similar" in physical appearance (1997, p. 394; see also Lindsay, Lea, & Fulford, 1991). Lindsay et al. noted that suspects may be arrested for several reasons other than physical appearance, such as prior criminal record or presence near the crime scene (1997). Lindsay and colleagues (1997) suggested that, in lineup absent conditions, the false identification rates should be examined. This is calculated by taking the proportion of incorrect identifications and dividing it by the nominal size of the lineup (Lindsay et al., 1997).

The types of errors made have different ramifications and pose different concerns. Errors of omission or "Don't Know" errors are seen as much less serious and troublesome errors under the American system of justice than are false positives, which are in fact false accusations of innocent people (Peters, 1991, p. 70). Dekle et al. (1996) found that, in the target-absent lineup, children who made errors made foil identification errors, choosing foils who would have been known to be innocent, and not making false identifications. Although in many situations a false positive identification will be known to investigators, as a known foil was chosen, in some cases a suspect may be selected and there is a risk of false accusation (Ricci, Beal, & Dekle). In addition, a witness who makes an incorrect identification may lose credibility, which could affect the witness' testimony about other information (Pozzulo & Lindsay, 1999).

Some researchers have separately analyzed the types of errors in lineup identifications. For example, Parker and Ryan (1993) conducted loglinear analyses with age (child, adult), gender, type of lineup presentation (sequential, simultaneous), and practice. The researchers appear to have conducted separate loglinear analyses for each type of lineup (lineup present, lineup absent) and each type of response (correct response, foil identification, and false identification). An analysis of correct identifications in the lineup present condition revealed no main effects (Parker and Ryan, 1993). There was, however, a significant main effect of age for foil and false identification errors, with children making more foil identification errors but fewer false rejections than adults (Parker and Ryan, 1993). In the target absent condition, Parker and Ryan combined foil and false identifications (they reported few false identifications) and the analyses revealed a main effect of age, making more mistaken identifications than adults (Parker & Ryan, 1993).

The rate of mistaken identifications, which can occur in both lineup present and lineup absent conditions, is an area of serious concern to researchers as well as to law enforcement. In their 1991 article, Goodman, Bottoms, Schwartz-Kenney, and Rudy (1991) noted the relatively high rates of false positives in lineup absent conditions found by two groups of researchers (King and Yuille; Parker and Carranza). Research has confirmed the findings that children are less likely than adults to correctly reject a target absent lineup; they have relatively high rates of choosing a photograph in the lineup absent condition, resulting in a false identification. (e.g., Dekle et al., 1996; Pozzulo & Lindsay, 1998).

Alternative Methods of Lineup Array Presentation

In the search for methods by which to improve eyewitness accuracy, researchers have considered other methods of presenting lineup arrays. The task of viewing simultaneous lineups is thought to depend upon a type of decision-making process known as relative judgments (e.g., Gonzalez, Ellsworth, & Pembroke, 1993; Lindsay et al., 1997). When the target is in the lineup, relative judgements tend to be successful, as the "guilty suspect is more likely than any other lineup member to resemble the witness' memory of the criminal" (Lindsay et al., 1997, p. 392). However, when the target is not present, witnesses may choose the person who is most similar to their memory of what the target looked like (Lindsay et al, 1997). Pozzulo and Lindsay (1999) described the process of making a decision in a simultaneous lineup as a two-step decision making process. In the first step, the witness makes a relative judgment as to which photograph or person most closely resembles the target. In the second step, the witness makes an absolute judgement as to whether that person is in fact the target (Pozzulo & Lindsay, 1999). Although the witness may not have to make an absolute judgment in a lineup present array in order to make a correct

identification, an absolute judgment is necessary in a lineup absent array (Pozzulo & Lindsay, 1999).

Lindsay, Lea, and Fulford (1991), Lindsay and colleagues (1997), and Pozzulo and Lindsay (1999) cited a number of studies involving adult witnesses that support the use of sequential lineups, which have been found to have no significant effect on the rate of correct identifications but to increase correct rejections in lineup absent conditions. Sequential lineups are conducted by presenting the witness with one photograph at a time (e.g., Lindsay et al., 1997). Lindsay et al. (1997) presented children (ages 8 to 10 and ages 11 to 15) and adults with simultaneous lineups, showups, and sequential lineups. There were no significant differences between the two groups of children on correct identification decisions (overall) but there was a significant difference between the adults and the children, with adults being significantly more likely to make correct identification decisions (Lindsay et al., 1997). There was no difference in the rate of correct "decisions" (overall) by children and adults in the showup condition or in the simultaneous lineup condition. However, when presented with a sequential lineup, adults were more likely to make a correct decision than children were (1997). There were no significant differences in the rates of correct identifications among the three types of lineup presentations (Lindsay et al., 1997).

A review of the table presented by Lindsay and colleagues reflects that, in the lineup absent condition, the proportion of adults making correct rejections in the lineup absent condition was higher in the sequential versus the simultaneous lineup condition, while the reverse was true for children (Lindsay et al., 1997, Table 1, p. 397). Lindsay and colleagues (1997) calculated the false identification rates for children with sequential lineup presentation (.17) and with the simultaneous lineup presentation (.14). Lindsay and colleagues concluded that

"[t]he sequential lineup procedure that works so well to increase correct rejections with adults is ineffective or even damaging to the identification performance of children" (1997, p. 402). Pozzulo and Lindsay (1998) found, in a meta-analysis of studies involving child and adult witnesses, that children viewing a sequentially presented lineup were less likely to make correct rejections and the difference in the rate of correct rejections between children and adults increased from simultaneous lineups.

Based upon the theory that lineup identifications involve two decision-making steps, Pozzulo and Lindsay (1999) have also investigated the use of elimination lineups. In a fast elimination lineup, the witness is first asked to select the person who most resembles the target. In a slow elimination lineup, the witness removes lineup members one by one, based upon which one least resemble the target (Pozzulo & Lindsay, 1999). Pozzulo and Lindsay found that, in the lineup present condition, the rate of correct identifications with elimination lineups were similar to those for simultaneous lineup presentations. In lineup absent conditions, elimination lineups yielded a significant reduction in false positive responses for child witnesses (1999). Pozzulo and Lindsay (1999) also examined the effect of combining elimination lineups with modified instructions that emphasized the importance of "making the right decision" and the negative consequences of a wrong decision (p. 171). They found that the children's false positive rate was similar to that for their adult witnesses, whose false positive rate had been fairly low (1999). Dr. Pozzulo's work in this area is ongoing. She has more than 2,500 children as subjects and plans to continue her research (Bagha, Z).

Uncertainty and Utilization of "Don't Know"

The recognition and the expression of uncertainty are important abilities for a witness to possess, as a Don't Know response may be the accurate response

for the witness. Within the eyewitness context, suggestibility--and children's ability to resist it--is one of the greatest concerns with regard to children as eyewitnesses (King & Yuille, 1987; Moston, 1987). King and Yuille, citing several other research studies, noted that children's suggestibility is thought to be influenced by developmental trends in the initial event perception and encoding; rates of memory decay; and retrieval abilities (King & Yuille, 1987).

King and Yuille, however, also recommended that "suggestibility" be considered in a different light: a legal term for what is in fact "sensitivity to context" (1987, p. 30). Leading questions provide one example of such context sensitivity (King & Yuille, 1987). King and Yuille suggest that children may be more suggestible than adults because they are more frequently faced with unfamiliar situations. Children will therefore attend more closely to context, including social and linguistic context, as a means of understanding the unfamiliar situation. Younger children would be more sensitive to context in "a verbal situation" where they are supposed to listen to an adult and follow the adult's instructions. King and Yuille theorized that, if the event about which a child was questioned was one that they had the social and cognitive competence to understand and if the child was interviewed "in a manner that is consistently meaningful and not contradicted by nonverbal cues," children would not be more suggestible than adults (King & Yuille, 1987, p. 30).

Davies (1996) suggests that young children may feel pressured or required to respond "positively" to questions, regardless of whether they know the answer. This response tendency may result in part from how children learn in the school environment, where answers are expected and not knowing an answer often equates with being unprepared or simply wrong (Davies, 1996). Pozzulo and Lindsay (1997) also noted that, while adults may recognize that "Don't Know" is an available response option, children either may not know that

it is a possible response option and, even if they do, may be less likely to use it due to "status and power differentials" between themselves and the adult (Pozzulo & Lindsay, 1997, p. 127). Moston (1987) emphasized the importance of considering the demand characteristics of the task and noted that, whether in an experimental setting or an actual interview, it is rare for subjects to be told that they do not have to answer a question. In a forensic setting, children may "overvalue compliance," which is given great value on a daily basis for them (Saywitz and Moan-Hardie, 1994, p. 411). Saywitz and Moan-Hardie noted that socioemotional factors, such as wishes to avoid angering adults, to please, and to protect self-image, are "plausible" reasons underlying children's suggestibility in the face of leading questions: children have a more egocentric focus and limited perspective-taking abilities. In addition, children do not have knowledge of the reason for the questioning; the relevance of their answer in a forensic context; or the interviewer's purpose in asking questions (Saywitz & Moan-Hardie, 1994, p. 412).

For young children, a lineup array may have effects similar to those of leading questions (King & Yuille, 1987). "The suggestive effect of direct questioning" is a factor in lineup identifications (King & Yuille, 1987, p. 28). The task demands of a lineup may result in confusion (King & Yuille, 1987) and/or such demand characteristics may encourage guessing (Raskin and Yuille, as cited in Ricci, Beal, & Dekle, 1996). A number of researchers have theorized that one reason that children are reluctant to admit uncertainty and will instead provide an answer is that the presentation of the lineup array may suggest to a child that the adult expects the child to choose someone (Gross & Hayne, 1996; Ricci, Beal & Dekle, 1996). Children may make the assumption that an adult would not present the task if the target were not present or may interpret the task to require a selection that most resembles the target (King & Yuille, 1987). Children who

make an identification from a lineup absent array do so instead of either rejecting the array or indicating that they are uncertain. Ricci, Beal, and Dekle (1996) note that, given the sensitivity of young children to "contextual implications," the children may feel as if they have to make an identification, regardless of whether they in fact recognize the perpetrator at all and regardless of their confidence in their selection (p. 484).

Research into children's understanding of communication also yields information about another factor that may be influencing children's response choices. Steward, Bussey, Goodman, and Saywitz (1993) discussed that young children, when presented with a question, may answer only the part they understand while ignoring other parts that may be very important to the adult. Although mastery of some aspects of communication is achieved by three-year-olds, other aspects are not mastered until approximately ten years of age (Steward et al., 1993). Saywitz and Moan-Hardie (1994), in a discussion of research in this area, note that children, in their role as listeners, make assumptions that speakers are providing reliable and credible information. Although adults are aware of exceptions to this principle, research suggests that children begin to develop an understanding of such exceptions sometime in the age range of nine to thirteen (as discussed in Saywitz and Moan-Hardie, 1994).

Researchers have examined children's ability to identify sources of error in a situation where there has been a communication failure, such as when a child is asked to point to the blue toy (when two blue toys are available) (Robinson, 1981; Bonitatibus, 1988). A listener blamer is a child who always places the responsibility for the failure on the listener, although the speaker's message was in fact unclear. A speaker blamer is a child who is able to attribute this responsibility to the speaker when appropriate and is able to identify at least one of the components missing from the speaker's communication (Robinson,

1981). Bonitatibus noted that previous findings suggested that the main difference between successful monitors (who could identify the source of error) and poor monitors is the degree to which the child attends to the literal meaning of the communication and this difference should manifest on a variety of tasks (Bonitabibus, 1988). Pratt and Wickens (1983) found that poor monitoring performance on such referential communication measures correlates with an impulsive cognitive style on other tasks, such as a tendency to respond quickly and to make errors (as cited in Beal, Schmitt, and Dekle, 1995). Beal, Scmitt, and Dekle (1995) noted that previous studies have found that, of a typical sample of children who are approximately five years of age, about 1/3 to 1/2 will be successful monitors. Beal et al. (1995) examined the relationship between children's ambiguity detection and their performance on the lineup arrays. In the target present condition, successful monitors were more likely to correctly identify the target than were poor monitors. There was no relationship in the target absent condition between identification errors and a tendency to guess in the communication game (Beal et al., 1995).

The research has consistently shown that, when presented with a lineup, children "make more choices and are prone to guessing" (Lindsay et al., 1997, p. 397). Lindsay and colleagues found that children ages 8 to 10 and children ages 11 to 15 were more likely to make correct identification decisions in lineup present conditions than in lineup absent conditions, while adults were less likely to be accurate in the lineup present condition (Lindsay et al., 1997) . Dekle, Beal, Elliott, and Huneycutt (1996) noted that, in a number of studies, children and adults have been equally accurate in making correct identifications in target present arrays. As children tend to have accuracy rates equal to or greater than that of adults in lineup present conditions, Lindsay and colleagues concluded that children do remember faces and recognize them. The difficulty with

children's response accuracy occurs more in the lineup absent conditions, where their tendency to choose leads to incorrect identifications (Lindsay et al., 1997). Dekle and colleagues (1996) examined the accuracy of children and adults in target present and target absent conditions utilizing both lineup arrays and showups (when one photograph at a time is shown to the witness, who must make a decision about that photograph in isolation). Adults received explicit instructions that included statements that they did not have to identify anyone and that they should not conclude that the person who committed the crime was in the array. They were also given an explicit don't know response option. The children, who received verbal directions, were explicitly told that the thief might not be in the array and that they did not have to choose any of the photographs; they were not, however, explicitly given the don't know response option. Since only one child gave a don't know response option, only responses that indicated the presence or absence of the suspect were utilized in analyses (Dekle, Beal, Elliott, & Huneycutt, 1996).

Dekle and colleagues (1996) found children were more correct in the target present conditions across the presentation methods (lineup, showup). Adults, however, were more correct in the target absent conditions across presentation methods (Dekle, Beal, Elliott, & Huneycutt, 1996). Only one of the children in this study gave a don't know response, while adults utilized the don't know response at a rate averaging 30% across all conditions. The age (adult-child) variable was the only one that had an effect on the rate of "don't know" responses (Dekle, Beal, Elliott, & Huneycutt, 1996). Dekle and colleagues concluded that children's greater accuracy in the target present conditions resulted from the greater use by adults of the Don't Know response option (1996). Similarly, in the study by Gross and Hayne (1996), Don't Know

responses comprised only 17% of the total number of errors made by the children.

In 1980, Warnick and Sanders presented the argument that the published research concerning eyewitness identification never contained explicit instruction to avoid guessing or that the Don't Know response option was both available and acceptable. In their experiment, Warnick and Sanders (1980) divided subjects into four groups, one which presented a regular lineup array and three in which subjects were given varying presentations of the Don't Know option. In this experiment, the lineup array contained the target and the subjects were adults. In a comparison of all three experimental groups with the control group, the subjects in the experimental group made significantly more use of the Don't Know response, fewer "not present" responses, and fewer false identifications. In fact, no subjects in the control group gave a Don't Know response. There was no significant difference in correct responses, although Warnick and Sanders anticipated a decrease. The expected decrease would have resulted from the apparent reduction in chance responses, as some of the subjects would make a correct response by chance. Warnick and Sanders theorized the subjects may have more carefully reviewed the choices or that sampling error could also have played a role (1980).

Moston (1987) investigated the effect of instructions concerning the acceptability of the Don't Know response option upon children's responses (correct, incorrect, or don't know) to a series of questions about a staged event. The children were from three different age groups: six, eight, and ten years of age. As in Warnick and Sanders' study, the instructions had no effect on the number of correct responses in Moston's study (1987). In Moston's study, however, children in the control group did utilize the don't know response, even without having received instruction. Moston also found no effect on the number

of incorrect responses. The experimental group did, however, more often utilize the don't know response. Moston found no interaction with age.

Moston (1987) concluded that his results did not support those of Warnick and Sanders, as he found no impact of instructions on the frequency of incorrect responses. Moston theorized that the children might not understand the instructions and might interpret such instructions to mean that a Don't Know response should be given if they cannot recall an answer right away. He also suggested that the instructions might be effective if the response option is not otherwise available (1987). Caution should also be used when comparing the two studies: Warnick and Sanders' study involved lineup identifications, with adult subjects, while Moston's study involved children's answers to 16 questions about an event. In addition, in Moston's study, correct responses, incorrect responses, and Don't Know responses were analyzed separately. It is unclear how the Don't Know responses interacted with the others; as the number of Don't Know responses increased, other responses had to decrease. Moston, however, did not find significant differences between the groups on either correct or incorrect responses (1987).

Training and Practice with Lineups for Child Witnesses

Having reviewed Moston's findings, Saywitz and Moan-Hardie (1994) theorized that, when faced with suggestions from adults, the mere presentation of instructions may not result in a child's using the new, Don't Know response option (1994). In a discussion of several studies, Saywitz and Moan-Hardie noted that exposure to a new response option is ineffective without metacognitive knowledge about the option's utility, such as information concerning its value in assisting performance. Saywitz and Moan-Hardie suggested that it would be necessary for children to learn to recognize situations where the response option is appropriate and to practice its application (1994).

Saywitz and Moan-Hardie (1994) concluded that children may have a variety of expectations with regard to task demands and that the behavior of adults could influence the children's responses to misleading questions. In addition, children may not realize that the adults have different expectations and different perceptions of the task demands. To examine adult behavior that might impact upon children's performance, Saywitz and Moan-Hardie developed an intervention that was focused upon increasing resistance to misleading questions and designed to increase children's awareness of task demands, response options and response consequences (1994). Children in the control group received instructions to do their best; children in the experimental group received training to resist misleading questions (Saywitz and Moan Hardie, 1994). Within the training protocol, children were introduced to misleading questions and were taught a strategy for responding to misleading questions; they also rehearsed answering leading questions. They were explicitly warned that questions could be misleading; that the children should not guess but should tell only what they actually remembered; and that the adult interviewer had not been present at the event at issue. Such measures increased the awareness of task demands.

Saywitz and Moan-Hardie (1994) also attempted to clarify the adults' expectations by warning the children that the questions might be difficult and that the children were not expected to know all the answers. To increase the children's awareness of response options, Saywitz and Moan-Hardie added drawings "to concretize and visualize" response choices, such as a picture of a person scratching his head to represent a lack of memory; a picture of a person shrugging his shoulders to represent lack of knowledge; and a picture of someone smiling to represent telling an answer that they knew (Saywitz and Moan-Hardie, 1994, p. 413). Two weeks after participating in a staged classroom event, children were questioned using a measure that involved leading

questions, misleading questions, and specific questions, which did not suggest an answer (Saywitz and Moan-Hardie, 1994).

Saywitz and Moan-Hardie found that, overall, children who received training made significantly fewer errors than those who did not (1994). When the effects on each type of question were examined, training did not affect errors on specific questions or correctly leading questions but did affect the errors on misleading questions. Children in the training group made significantly fewer errors in response to misleading questions than children in the control group. The training reduced errors on misleading questions without affecting the proportion of correct responses to misleading questions. The training did, however, affect the number of correct responses to the other question types (correctly leading and specific), with the training group having fewer correct responses. In addition, children in the training group utilized the Don't Know and don't remember responses for all question types more often than did children in the control group. Saywitz and Moan-Hardie theorized that the reduction in correct responses to correctly leading and specific questions could have resulted from the children developing "an overly cautious response set and overgeneraliz[ing]" the don't know strategies (Saywitz and Moan-Hardie, 1994, p. 417).

Concerned with the reduction in the number of correct responses to correctly leading and specific questions, Saywitz and Moan-Hardie (1994) conducted a second experiment and modified the training protocol. In this protocol, the children were trained in small groups and were told that the interviewer had some doubts about children's abilities. They were also given more opportunities, and reinforcements, for providing an answer when they knew it. Following such training, children made fewer errors in response to both misleading questions and to specific questions than did children in the control

group. The effect of the training on Don't Know responses was replicated. Across all types of questions, the training group more often employed the Don't Know response. The training did not, however, significantly reduce or increase correct responses on any question type (Saywitz and Moan-Hardie, 1994).

Pozzulo and Lindsay (1997) examined four variations to lineups presented to adult college students, children ages 10 –11 years, and children ages 12 to 14 years. Pozzulo and Lindsay's variations included (1) explicit inclusion of the Don't Know response option, both in the instructions given to subjects and on the response form; (2) instructions that emphasized that the subject should not pick someone if they did not see the target photograph and expounding some on the consequences of false positives in appropriate terms; (3) a video demonstration of someone making an identification in a lineup present and in a lineup absent situation; and a "reference handout" with illustrations of a correct "not here" response and of a correct identification (1997, p. 128-29).

In the lineup absent condition, all of the experimental variations except for the inclusion of the Don't Know response option resulted in non-significant increases in correct rejections. In the lineup present condition, all four experimental variations resulted in younger children making more correct identifications, but only significantly more for extended instructions. For older children, the proportion of correct responses showed nonsignificant increases for all experimental conditions except for extended instructions. Pozzulo and Lindsay (1997) concluded that, overall, the Don't Know response was used infrequently and, when it was explicitly presented, subjects showed an increase in choosing (selecting someone from the lineup).

Research exploring children's recognition and expression of uncertainty in other contexts has yielded findings that seem consistent with the outcomes seen in identification studies.

Peterson, Dowden, and Tobin (1999), in a review of research concerning children's response to specific questions, noted that young children seem to interpret questions presented in a yes/no format as requiring a response, even if the children do not know what the question is asking or what the answer is. Peterson, Dowden, and Tobin noted that specific questions are regularly presented in a yes/no format or in a "wh-" format, such as where or what questions (where was she, what was she wearing). The research concerning the effectiveness of instructions concerning "Don't Know" as an option has yielded mixed results. Peterson and colleagues focused upon whether preschool children (between the ages of 3 and 5) were less inclined to spontaneously make use of "don't know" as a response option if the specific question was presented in a yes/no format as opposed to the "wh- question." They also examined the effects of a yes/no question where the correct answer was positive as opposed to negative. Their analysis also examined accuracy for questions about actions, about people, and about the environment (room) (Peterson et al., 1999).

Peterson and colleagues (1999) found a significant interaction between question type and content as well as significant main effects for both question type and content. The format of the question was significant for all three content types; within the person content, children made more errors when presented with "no" questions than when presented with yes questions or wh-questions; they made more errors in response to wh-questions than to yes questions. Peterson and colleagues found that children made notably more errors when presented with "no" questions concerning persons. [15] Although the study by Peterson, Dowden and Tobin did not involve a lineup array, this result seems to

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[15] Examples of person content questions in the Peterson study included the following: was she wearing happy-face buttons; was he wearing a Santa Claus tie (Peterson et al., 1999).

support the research that has found that children perform well in lineup present conditions (where the positive response of choosing is correct) and less well in the lineup absent conditions, where a complete rejection or no choice is the correct response.

Equally notable from the Peterson study (1999) is the effect of question format on the use of Don't Know as a response. The researchers found a significant interaction effect between format and content, with a significant main effect of question format. Although children responded to almost 40% of the wh-questions with a Don't Know response, they responded with Don't Know to 5% or less of the yes/no questions. Content also proved significant as a main effect; for persons, children said Don't Know more frequently to the wh-questions than to yes or no questions, with no differences in the use of this response with respect to yes or to no questions. As noted by Peterson and colleagues (1999), in many situations, particularly forensic ones, the interviewer does not know a priori which answer is the correct one to the yes/no question. Peterson and colleagues also noted that the increased accuracy of the children when presented with yes/no questions to which "yes" was the correct answer did not mean that they are necessarily more reliable. This pattern could be reflective that children tend to guess when presented with yes/no questions and that they seem to have a bias toward answering yes (Peterson et al.,1999).

Goodman, Bottoms, Schwartz-Kenney, and Rudy (1991) believed that one area where techniques to improve accuracy are needed is in reducing false positive identifications. They argued that, if it is assumed that lineups may prove to be "inherently suggestive to children," techniques that might improve children's performance on making photographic identifications should be developed. (p. 73). Goodman et al. (1991) noted that children may not understand that the lineup does not necessarily contain the target photo, even if

the children are given notice of this possibility. They conducted a study to explore their theory that training procedures with sample lineups could assist children in understanding that the target photo may not be present in the array and that the right answer might be one where the child does not point to any of the photos.

Davies (1996), in a review of research concerning children's eyewitness abilities, notes that "practice procedures" seem to have the potential to reduce the "impulse to chose [sic]." According to Davies, research has not yet established the conditions necessary for such training to be effective, nor the age range over which such training would be effective. Research by Davies et al. found no effect of training on the children's response choices (as cited in Davies, 1996). Other researchers, however, have found an effect.

Goodman, Bottoms,Schwartz-Kenney, and Rudy (1991) conducted a study in which children ranging in age from three to seven years of age were videotaped at a medical clinic; half of the subjects were presented with practice identification tasks. Goodman et al. (1991) presented three six-item practice arrays: a lineup present array with animals with which the children would have been familiar; a lineup absent array with pictures of women resembling the ethnicity of the child's mother; and a lineup present array with the interviewer's picture. The experimental lineup did not contain the target. Goodman et al. found that children who had been exposed to the practice arrays had improved performance, making fewer false identifications (don't know was not an identified response option). Goodman et al. also found an effect of age, with younger children being less accurate overall. In addition, planned comparisons indicated that only the older children showed significant improvement following practice; the younger children continued to show poor performance (Goodman et al., 1991).

Parker and Ryan, noting the conflicting results obtained by Davies et al. (1988) and Goodman et al. (1991), pursued a study of the effects of training. Parker and Ryan also noted the age difference between the subjects in Davies' study (ages 7 to 12) and in Goodman's (ages 3-7 years) (as cited in Parker & Ryan, 1993). Following presentation of a slide show, Parker and Ryan presented half of their subjects, which included children (8 years to 11 years of age) and adults, with two practice lineups prior to viewing the experimental array. The practice arrays contained three photographs of women; one array contained the interviewer's face (lineup present) and one did not (lineup absent). The interviewer would confirm a correct choice on the practice array and identify the correct response if the subject made an incorrect choice. Photographs of women were used in the practice arrays while the experimental arrays contained photographs of men; Parker and Ryan noted that the genders were deliberately varied in order to reduce interference (Parker & Ryan, 1993). Parker and Ryan found that practice did reduce the number of errors in simultaneous lineup presentations in the lineup absent condition; practice did not affect accuracy in the lineup present condition (1993).

Parker and Myers (2001), in a study with elementary school students, examined the effect of practice lineups and practice videos on identification accuracy with sequentially presented lineup arrays. Parker and Myers found that male children and female children responded differently to practice in the target present lineups, with female children's correct identification rate increasing while male children exhibited no change or a decrease. There were no signficant differences with practice for the target absent lineups (Parker & Myers, 2001).

Pozzulo and Lindsay (1998), in their meta-analysis, found that training did not significantly reduce false rejection rates in lineup absent arrays for older

children or adolescents. In regard to correct identifications, Pozzulo and Lindsay noted that the "benefits of training on correct identification for older children may be small. Yet, training may help older children reach an adult level of correct identification (1998, p. 563).

Beal, Schmitt, and Dekle (1995) tried modifying the lineup procedure to further examine children's tendency to guess. In one experiment, they examined whether the guessing behavior in the lineup absent condition resulted from a preference for pointing over using a verbal response; a Not Here card was added to the six lineup photographs, which were presented in a line, with the order of photograph placement randomly varied. There was no main effect of lineup type (original lineup or modified lineup). However, as the researchers had theorized that the modified lineup would have an effect in lineup absent conditions, the target-absent group was analyzed separately. Within this group, there was a significant association between accuracy and the lineup condition, suggesting that the addition of the "not here" card may have increased the abilities of some children to reject the lineup (Beal, Schmitt, and Dekle, 1995). The authors, however, concluded that this finding must be viewed cautiously, as their other experiments with the same stimulus and lineup arrays yielded a lower rate of false positive identifications than was the case in the first study (Beal, Schmitt, and Dekle, 1995).

In another experiment, Beal, Schmitt, and Dekle (1995) assessed whether the identification errors resulted from inattention or poor encoding during observation of the target event. The children were videotaped during the experiment and their response behavior was coded for factors such as whether they viewed the entire lineup prior to making their choice; how they responded when asked if they were sure of their choice; and apparent confidence. Their response time was also assessed. Approximately 88% of the children examined

the entire lineup before responding. In general, children who made accurate responses took more time to do so than children who made inaccurate responses. Although adults who make accurate identifications do so more rapidly than those who make incorrect decisions, the children in both lineup present and lineup absent conditions did not follow this pattern. Beal and colleagues suggested that the relationship between accuracy and decision-time may change as a child develops, although they noted that further research was necessary to confirm their findings. After examining the results of their experiments, Beal and colleagues concluded that identification errors may not be due to poor memory but, rather, to other factors. The evidence did not support the theory that such errors result from impulsive decision-making, poor attention or encoding; or difficulty with the required response type (pointing or verbal responses) (Beal, Schmitt, and Dekle, 1995).

The Young Eyewitness Research Study

"Because the law is concerned about children's capacities only as they are demonstrated in a particular legal context, legally relevant research necessarily must address performance and how it may vary with age, psychosocial development, context, and task" (Woolard, Reppucci, & Redding, 1996, pp. 220-21).[16] Woolard and colleagues commended the line of research focused on child witnesses, noting that research has focused on children's performance and "specific abilities," including research (specifically referring to Gross and Haynes, 1996), that investigated "practical conditions under which eyewitness

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16 Woolard et al. (1996) discussed the differences between competence or capability and performance and the importance of gaining knowledge into the circumstances under which these differ. The authors defined competence as "knowledge and abilities expressed under ideal circumstances" (Woolard et al., 1996, p. 220). "Performance includes the processing activities required to demonstrate knowledge," in addition to context, interpersonal, and other factors that affect performance (Woolard et al., 1996, p. 220).

recognition memory is more accurate" (Woolard et al., p. 223). A number of eyewitness researchers, both those focused on adult witnesses and those focused on children, would seem to agree. "The task for researchers is to present a clear picture to law enforcement agencies as to the need for procedural changes and the form that such changes should take" (Steblay, 1997, p. 286). Pozzulo and Lindsay (1998), who conducted a meta-analysis of studies that included child and adult witnesses, noted that "too few data have been collected on the identification performance of younger children" (p. 568).

This research study focuses upon the possible ways to improve young children's identification response accuracy when presented with a lineup array. The methodology, and the data that are examined, replicate some of the previous studies and also add to the existing research. Performance in both lineup present and lineup absent conditions is examined. Very young children have been included as subjects in this study (age range 3 years through 8 years, 11 months). In addition to being less often included in studies, younger children are often the ones who present the greatest concerns in terms of credibility and reliability. The stimulus materials and the main lineup array are slightly modified versions of those used in previous work by Beal, Schmitt, and Dekle (1995); Ricci, Beal, and Dekle (1996); and Dekle, Beal, Elliott, and Huneycutt (1996). The slide show and the lineup array are being reused by permission from Dawn J. Dekle and Carole R. Beal.

The main focus of this study is the effectiveness of training children about making lineup identifications, including the availability of a Don't Know response. In doing so, this research follows the suggestion of several researchers in the field, such as Wells and Seelau, (1995), that to make the most effective use of eyewitness research there needs to be more of a focus on system variables (Steblay, 1997; Seelau & Wells, 1995; Turtle & Wells, 1987). In addition, this

research is consistent with some of the recommendations of the Eyewitness Evidence guidelines, which, although designed for adults, are nevertheless relevant. The Eyewitness Evidence: Guide for Law Enforcement recommends telling the witness that he or she will be looking at photographs and that the suspect may or not be among the photographs (U.S. Department of Justice, 1999).

Specifically, this study explores the effects on children's response accuracy of providing children with explicit training and practice in the use of all response options (including the Don't Know response option and both verbal and nonverbal response options). This study also attempts to discern whether there is a developmental stage, and/or chronological age, at which training procedures are effective.

Chapter 2: Method

Participating Sites

Schools, day care centers, and other children's programs were requested to participate in this research study. Three separate sites in eastern Virginia agreed to participate. Each site enrolled children from the entire age range (3 years, 0 months to 8 years, 11 months) of this study.

Trinity Lutheran School (Trinity), located in Newport News, Virginia, is "an educational and social ministry of Trinity Lutheran Church" (Trinity Lutheran School, 2003, brochure). This author attended Trinity for elementary school. Trinity's programs include its Preschool Program; Kindergarten Program; and Elementary and Intermediate Divisions (grades 1-8). Trinity's enrollment is approximately 400 students. The Preschool Program includes classes for three-year-olds and for four-year-olds. No testing is required for the preschool programs. The Kindergarten program offers 1/2 day and full-day programs. Admission for kindergarten and higher grades is based upon factors including testing. For the 2003-04 school year, Trinity had an enrollment fee of $200 for all grades. Yearly tuition ranged from $2,300 (preschool and 1/2 day kindergarten) to $4,060 (grades 1-5) (Trinity Lutheran School, 2003, brochure and information packet).

Bright Heights Learning Center (formerly known as Bright Horizons Learning Center) (Bright Horizons)[17], located in Newport News, Virginia, is

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17 Until late 2003, Bright Heights Learning Center operated under the name of Bright Horizons Learning Center. At this time, they have changed their name to Bright Heights

solely owned by Ms. Becky Dollins, M.Ed. Bright Horizons is licensed by the Virginia Department of Social Services to provide services for children ages 6 weeks through 12 years. Admissions are not selective. Bright Horizons operates year-round. The curriculum has been developed based upon "Piaget's theory that children learn best by doing" (Bright Heights Learning Center, Welcome Packet (2004) and Bright Horizons Learning Center Parent Handbook (2003)). Classroom placement is determined by chronological age and is based on the public-school cut-off date of September 30. Participating classrooms included the younger three-year-olds; the class for older 3-year-olds and 4-year-olds; the class for 4-year-olds and 5-year-olds; and the school-age classroom (which operates full-time during the summer and around school hours during the school year). (Bright Horizons, personal communication with Bright Horizons staff and observations, July 2003-February 2004). Weekly tuition rates range from $81 for before/after school to $135 for full-time preschool (Bright Heights Learning Center, Welcome Packet (2004) and Bright Horizons Learning Center, Weekly Tuition Rates (June 16, 2003)).

The United Jewish Community of the Virginia Peninsula (UJC), located in Newport News, Virginia, includes the Shalom Yeladim Early Childhood Center and the Hebrew School. Shalom Yeladim has three preschool classrooms and one kindergarten classroom as well as an Extended Day program. All of these programs participated in this study. Admissions are not selective. Classroom placement is determined by chronological age and is based on the public-school

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Learning Center and are now operating under that name (Dollins, Rebecca. Personal Conversation, February 10, 2004). However, all documentation regarding this site was prepared while it was known as Bright Horizons. Therefore, for consistency and clarity, this paper refers to this site as Bright Horizons Learning Center (Bright Horizons).

cut-off date of September 30. All preschool classes are half-day. Participating classrooms included the class for two-year-old and three-year-old children, the three-year-old class, the class with older three-year-olds and four-year-olds, and the kindergarten class. Monthly fees range from $79 to $402. (Shalom Yeladim Early Childhood Center, 2003/2004 Fees). The Hebrew School has a curriculum "designed so that the students learn Hebrew through Bible, Prayers, Holidays, Jewish Ethics, and Jewish History" (UJC, 2003). The class for third-through-seventh grade students meets on Tuesdays and Thursdays (UJC, 2003). Although children from this class were recruited, no consent forms were returned from this class. The class for first-graders and second-graders is held once per week on Wednesdays.

Recruitment of Subjects

Permission was first obtained from each of the three participating sites. At each site, this author personally met with the school administration and staff. The sites had the opportunity to review consent forms, assent forms, parent letters, protocol summaries, and the video if they wished. At one site, a child abuse clearance check was conducted on both interviewers. Each site determined which of their classrooms would participate. Information packets were provided to the site for each child within the age range in participating classrooms. The information packets contained the following: (1) a letter to the parent(s) (parent letter) that introduced this researcher and the research project; (2) a consent form; and (3) a one-page parent questionnaire. Contact information for this author was included in the parent letter and the consent form. At the UJC, the information packets also contained a letter written by the school to the parents.

The parent letter was site-specific. For example, each contained a specific salutation and references to that site (e.g., "Dear Trinity Parent") and thus varied slightly between the three sites. The consent form was standard across the sites, although as noted below it was modified at times during the course of this study. The two versions of the parent questionnaire differed only in that one version contained one additional question requesting the name of the child's home school. This version was provided for children at Bright Horizons or at the UJC who might attend a different setting for regular academic instruction. Parent(s) were requested to return the consent form and the parent questionnaire to the school. However, failure to return the parent questionnaire did not exclude a child from participation provided that the information could be obtained from the school.

During the course of this study, the forms in the information packet were modified and reviewed by the Office of Research Compliance as sites were added or administrative changes were needed. Changes included some clarifications to study descriptions; grammatical corrections; administrative changes such as a change in the Head of School; and changes reflecting the addition of sites. The consent and assent forms in Appendices A and B are the most current versions. The parent letters presented in Appendix C are the letters last approved for each site (only the UJC parent letter is actually current).

At Trinity, information packets were sent to parents of children within the age range in participating classrooms and in the Extended Day program during both the 2002-03 and the 2003-04 academic years. During the 2003-04 school year, teachers were informed of children in their classroom who had participated in the research study during the previous school year and packets were not

provided for these children. At Bright Horizons, information packets were sent to parents of children in participating classrooms during the summer of 2003 and during the late fall/early winter of the 2003-04 school year. Packets were not provided for children who had previously participated. At the UJC, information packets were sent to parents of children within the age range in the preschool and kindergarten programs and in the Hebrew School during the late fall/early winter of the 2003-04 school year. All parent letters for Bright Horizons and for the UJC and the parent letters for Trinity during the 2003-04 school year contained an explanation that the parent may already have received information about this study and that each child could participate one time. A copy of each signed consent form was returned to the site for return to the child's parent(s)/guardian.

Interviewers

Three key personnel completed on-line training required by the Office of Research Compliance and all three received some additional training concerning the research. The three key personnel were Ms. Theresa Chisman, B.A. (a close friend of the author); Mrs. Jean Huneycutt, B.A. (the author's mother); and Mr. John C. Iorio, J.D. (the author's fiancé). Ms. Chisman and Mr. Iorio observed the author completing the research protocol with children in the school setting. However, due to factors unrelated to this project, only Ms. Chisman was able to actually assist in data collection. Ms. Chisman completed numerous observations of this author conducting the research protocol with children. This author observed Ms. Chisman completing the research protocol with children. This author also conducted data collection. In doing so, the author was able to

have first-hand knowledge of the execution of the experimental protocol and children's responses to it.

Subjects

The subjects were children who were enrolled at the participating sites and who ranged in age from 3 years, 0 months to 8 years, 11 months of age. Children for whom a consent form, signed by at least one parent/guardian, was returned were eligible for inclusion.[18]

During the 2002-2003 school year, 10 teachers at Trinity had children who participated in this study (six classrooms participated and four teachers had children who participated during Extended Day). During the 2003-04 school year, 11 teachers at Trinity had children participating in this study (10 classrooms participated and one teacher had a participating student in Extended Day). At Bright Horizons, four classrooms had students participating in the study. At the UJC, four classrooms had children participating in the study, as did the Wednesday Hebrew School class.

Exclusion Criteria

No subject was excluded from participation or analysis based upon ethnicity or gender. The following factors (assessed by the parent and/or the classroom teacher) excluded a subject from inclusion in the experimental analysis, although the child could participate in the experimental tasks if the classroom teacher agreed and if the child wished to do so.

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18 The author returned consent forms, with accompanying notes, if the consent form was missing the child's name, the parent's name, or a signature. One consent form was also returned because the parent noted "under strict supervision of [the site]" on every page. As it was unclear whether the parent would have considered the method in which the study was being conducted to be "strict supervision," this consent was returned with a note describing the conditions in which the children were seen at that site.

1. Children who are unable to speak or to understand spoken English sentences (one child met this criteria based upon parent information).
2. Children requiring significant special education support (such as full-time aides, specialized classroom placement) to assist with mental health, behavioral, or significant academic difficulties. Learning support services, specialized placement for isolated classes, or repeating a grade did not exclude a subject. Diagnostic information (such as the type of learning difficulty or mental health diagnosis) was not requested. Students requiring significant special education services were excluded because of the potential confound of chronological versus developmental age. (No children met this criteria).
3. Significant visual (eye) or auditory (hearing) impairment that is not correctable by aids such as glasses or hearing aids or by adjustments to viewing distance or sound volume. (No children met this criteria).

The following excluded a subject's inclusion in the main analyses and, in a few instances, lead to a subject being unable to complete the entire experiment:

1. Inattention to video stimulus (more than 3 instances, after redirection, of clear inattention to video following presentation of initial slide image). (No children who could be included in the main analyses were excluded based on this criteria).
2. Refusal to remain in a position to view the video following redirection attempts. (No children who could be included in the main analyses were excluded based on this criteria[19]).

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19 For example, some children who did have significant difficulty in paying attention to the video were not included in main analyses because they were in the Pilot Group; had incomplete data (discontinued); or could not accurately identify video content and therefore could not be included in the main analyses.

The following prevented a subject's inclusion in at least some of the main analyses but did not affect a subject's participation in the experiment:

1. Lack of recall of theft (inability to recall sufficient information from the video, despite prompting) (11 children were excluded based on this criteria. As discussed in Results, an additional 2 children were excluded based on lack of knowledge of colors or shapes).
2. Failure on both training trials (4 children were excluded based on this criteria).
3. Inability to obtain necessary demographic information (such as birth date; age) from the school, the teacher(s), or the parent(s). (No children were excluded based on this criteria).

In addition to the above criteria, some children were not able to complete the entire protocol due to time constraints (such as if they were seen close to the end of the school day or if they were picked up early by a parent). Children who wished to stop participating were permitted to do so, with no negative consequence to them, and to return to their classrooms.

Confidentiality

The consent forms, the assent forms, the parent questionnaire, and the teacher questionnaire contain the child's first and last name, as well as other identifying information. Data recording sheets are marked with the child's first name and last initial, date of birth, grade, and age. Each child was assigned an identification number by which data were entered and analyzed. A master list contains each child's name, school, and identification number. Upon termination of this research project, a sticker with the identification number will be affixed on all data record sheets, obscuring the child's name. The only documents with a child's name still visible will be the consent and assent forms; questionnaires (parent and teacher); and the master list.

All information (including consent forms, data record sheets, and the master list) has been securely stored by this author. Paper files (such as data record sheets) have been maintained either in the personal possession of this author or key personnel collecting data and are stored securely. Computer data has been stored on a limited-access personal computer and on discs under the personal control of this author.

This study has been conducted in full compliance with APA standards and with Drexel University's Office of Research Compliance (ORC) and is currently approved by the ORC.

Random Assignment

Individual children were assigned to one of four experimental groups.

Group 1	Lineup Present, Training
Group 2	Lineup Absent, Training
Group 3	Lineup Present, Control
Group 4	Lineup Absent, Control

Table 2:

Experimental Groups

		Lineup condition	
		Lineup Present (LP)	Lineup Absent (LA)
Experimental Condition	Training (intro. instructions and 2 training trials)	Group 1 Lineup Present Training	Group 2 Lineup Absent Training
	Control (intro. instructions and card sort)	Group 3 Lineup Present Control	Group 4 Lineup Absent Control

Approximately equal numbers of subjects were assigned to each group. Multi-stage, stratified random assignment was used, based upon grade in school and gender. Bordens and Abbot (1991, p. 217) described the use of random assignment through a random number table. This author randomly assigned children with completed consent forms to one of the four experimental groups through the use of a table of random ordering of the numbers 1-30; the random orders were "derived" from a BASIC computer program (Bordens and Abbot, 1991, Appendix I, Table I-1B, Random Orderings of the Numbers 1-30, and Note). This table permitted the use of a grid system, with the rows representing experimental groups and the columns representing grade and gender. Rows were established using the four experimental groups. Row 1 was assigned to Group 1, Row 2 to Group 2, Row 3 to Group 3, Row 4 to Group 4, Row 5 to Group 1, and continuing). Each participating classroom was assigned to two

columns of the table: one for female participants and one for male participants. As class sizes were limited, each participating classroom was also assigned a range of numbers (1-10, 11-20, or 21-30). For example, one first grade classroom at Trinity Lutheran for 2002-2003 was assigned columns 5 (female participants) and 6 (male participants) and numbers 21-30.[20] The following is an example of the random assignment process. For the 2003-04 year, one of the first grade classrooms at Trinity was assigned to the number range 21-30 and to columns 27 (female participants) and 28 (male participants). The first female participant from this classroom was assigned Number 21. Within Column 27, the number 21 was located in the row assigned to Experimental Group 4. Therefore, this child was randomly assigned to Group 4.

Stratified random assignment was used in order to ensure that age, gender, classroom teacher, and grade would be approximately equally distributed among the four experimental groups. In order to reduce interviewer bias by allowing the interviewer to remain blind to the experimental group assignment for as long as possible, the author created two envelopes for each child. One envelope contained information about experimental condition (training or control/card sort) and the other contained information about lineup assignment (lineup present or lineup absent). The interviewers did not open the relevant envelopes until immediately prior to beginning either the training or the card sort task and then again immediately prior to presenting the main lineup array (but after reviewing the directions for the lineup array with the child).

[20] The participating classrooms at Trinity were set separately for the two academic years (e.g., a first grade classroom at Trinity that participated during both academic years was reassigned to different columns and number ranges for each academic year).

Pilot Study

Although the protocol specified that the first five children interviewed by any experimenter would be considered part of the pilot study, this author determined it to be more appropriate for the first six children interviewed by any experimenter to be considered part of the pilot study. It was not necessary for a child to complete the entire protocol in order to be included as a pilot subject[21]. All but one of the pilot subjects participated in the training condition, so that the interviewers gained experience in using the training arrays. This author saw six children as pilot subjects at Trinity late in the 2002-2003 school year and then began main data collection there. Ms. Chisman completed observation and some pilot data collection during the 2002-03 school year but completed observation training and pilot data collection during the 2003-04 school year.

The 12 pilot children have not been included in the main data analyses. The pilot subjects seen by this author were interviewed prior to any random assignment to experimental groups. Therefore, other than reducing the number of children available for random assignment, their inclusion as pilot subjects had no effect on the number of children within each of the four experimental groups. The children seen by Ms. Chisman, however, had already been assigned to experimental groups. Therefore, the number of children assigned to each of the four experimental groups may have been affected by the loss of the six pilot subjects.

To an extent, the experimenters did not "choose" pilot subjects, as teachers determined which students were available to be seen. However, the experimenters identified certain ages or genders that would be preferable in

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21 Of the 12 pilot children, the majority (7) completed all sections of the study Five children did not complete the referential communication task and, of those five, one did not complete the main array. Reasons underlying incomplete protocols included time constraints, experimenter error, and a child's wishes.

order to have a more representative sample of children within the pilot group. Due to the low number of available subjects from minority groups, the experimenters made efforts not to include minority subjects in the pilot group.[22]

The pilot study served two primary objectives. It allowed the establishment of time requirements and allowed difficulties with the protocol to be modified prior to beginning main data collection. For example, the physical presentation of the training arrays, the data collection sheets, and some of the photographs in the training arrays were modified based upon pilot response. Pilot data collection also provided the interviewers with an opportunity to become familiar with the protocol, the materials, and the data collection sheets.

Video Stimulus

A video and DVD[23] were created from 28 color slides. The video depicts five Caucasian adults, three men and two women, at a picnic. One of the women leaves a camera, which is expensive in appearance, on a table. In slide 14, a third woman ("perpetrator") walks into the picnic area. This woman walks by the group, eats some food from the picnic table, picks up the camera, and leaves. The perpetrator is shown in 12 slides (41%) (slide numbers 14-22, 24-26) and is shown from a variety of angles, although many are from a distance. There is a direct view of her face in only one slide. In the last slide, the original woman is shown looking for her camera. An accompanying narrative was recorded by a male who was not involved with data collection. The narrative description was generally based on this author's recollection of the narrative used in the study by

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22 One minority subject was seen as a pilot subject by Ms. Chisman. This child was initially identified as a subject for the main study. However, after he was unable to identify the necessary video components, Ms. Chisman completed the remainder of the protocol with this child and he was reassigned as a pilot subject. He also met criteria for exclusion from analyses based upon the Parent Questionnaire.

23 DVD copies of the video were created for record and storage purposes but were not used in this study.

Dekle et al. (1996). However, there was no written record of the original narrative.

The narrative includes statements that people are at a picnic; that they are using a nice camera to take pictures; that a stranger has arrived and that nobody seems to notice her; and that she takes something that does not belong to her. The narrative content included information in both statement and question form (i.e., look, what is she doing? She seems to be picking up the camera). The narrative text is presented in Appendix G.

In the original experiments, the slide show was presented with the slides shown to the child for an average of 5 seconds per slide. In this study, the first slide was presented (in video format) for 20 seconds. The first slide was presented for a longer duration in order to provide time for the child to become engaged in the activity and for the narrative to "set the scene." In addition, the extended time on the first slide proved to be beneficial with technical adjustments (including minor ones such as adjusting volume, seating position, or lighting, and slightly more involved ones such as tape or VCR malfunctions). Following the presentation of the first slide, the remaining slides were presented for 8 seconds each. This duration was slightly longer than in the original experiment by Dekle et al. (1996) in order to allow for the child to observe each image and for appropriate narration to be provided.

Video presentation has several advantages. The results can still be compared with previous experiments, as the substance of the stimulus remains the same. However, changing the presentation may increase the generalizability of the findings. Children are certainly more familiar with video presentations. Consistency across presentations is increased by the video presentation, which allows several variables to remain constant both within and across interviewers: the exposure time of each picture, the quality of the image, and the narration.

Development and Functional Size of Main Lineup Arrays

The two lineup arrays (Lineup Present and Lineup Absent) that were presented in this study were developed by Dekle and colleagues (1996). Each of the two lineup arrays consisted of black-and-white head-shots of six Caucasian women with shoulder-length dark hair and neutral facial expressions. The Lineup Present array included a picture of the woman who took the camera. This woman's picture was replaced by another woman's photograph in the Lineup Absent array, which, therefore, did not include a picture of the perpetrator (Dekle et al., 1996; see also Beal et al., 1995)[24]. In accordance with the procedure outlined by Wells, Leippe, and Ostrom (1979), functional size was determined in order to establish lineup fairness (Dekle et al, 1996 (citing Wells, Leippe, and Ostrom (1979); see also Beal et al., 1995, (citing Wells, Leippe, and Ostrom (1979)).

Functional size is the total number of "mock witnesses" divided by the number of mock witnesses who identify the "defendant" (Wells, Leippe, and Ostrom, 1979, p. 288; Wells, 1978). The "mock witnesses" are provided with a description of the suspect, as he or she had been described by other witnesses, and are then asked to identify the suspect from the lineup (Wells, 1978). This ratio, the functional size, is the "reciprocal transformation" of the probability of choosing the defendant (Wells, Leippe, and Ostrom, 1979, p. 288). Wells, Leippe, and Ostrom described functional size as "reflect[ing] the number of feasible lineup members" (1979, p. 288).

Bartol (1983, citing Wells, Leippe, and Ostrom, 1979), described functional size as measuring the number of photographs in the lineup that "resemble the suspect in physically relevant features" (Bartol, 1983, p. 187). Functional size has

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24 In the Lineup Absent array, the replacement photograph was described as "a designated innocent suspect" (Dekle et al., 1996, p. 4).

also been described as "focus[ing]" on bias for or against the suspect (Parker & Carranza, 1989, p. 138). [25]

While the nominal size of a lineup is the number of people in the lineup, functional size is the number of people in the lineup who "resembl[e]" the suspect" (Wells, Leippe, and Ostrom, 1979, p. 285). Loh noted that nominal size may be greater than functional size "if some of the lineup members are easily perceived" as different from the suspect (1984, p. 564-65). In a fair lineup, the functional size "should approximate the nominal size" (Bartol, 1983, p. 188).

In developing the lineup arrays, Dekle and colleagues presented the lineup present array to 96 adults, who had not seen the slide show, and to whom an average description (written by other subjects who had seen the slide show) of the perpetrator had been given. If the subjects made their choice completely on chance, each picture in the array would be selected 16 times (96/6). Twenty-four subjects selected the perpetrator. Every other woman pictured in the lineup was chosen at least 12 times, which is at least 75% of chance, and therefore was considered to be an acceptable foil for the woman who took the camera (Dekle et al., 1996; Beal et al., 1995). The Lineup Present array (which contained six photographs and did not contain the additional cards reflecting Don't Know and Not Here response options) had a functional size of 4 (Dekle et al., 1996; Beal et al., 1995).[26] The Lineup Present array was considered a fair lineup (Dekle et al., 1996). The same procedure was repeated, with a different set of 96 adult

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[25] In addition to utilizing the measure of functional size, lineup fairness has also been assessed by measuring effect size, which asseses "the degree to which a lineup contains implausible foils" (Parker & Carranza, 1989, pp. 137-38).

[26] Fifty-two subjects viewed the slide show and provided a written description of the woman who stole the camera. From these descriptions, an average description was developed and presented to 192 adults who had not seen the slide show. Twenty-four of the 96 subjects who were presented with the Lineup Present array chose the perpetrator (96 / 24 = 4) (Dekle et al., 1996).

subjects, in developing the Lineup Absent array (Dekle et al., 1996). In the Lineup Absent condition, the subjects' identification choices were distributed "approximately evenly" across the six photographs, with no photograph picked at a rate less than 75% of chance (Dekle et al., 1996; Beal et al., 1995).

The original lineup array(s) presented the photographs on a single sheet of 8 1/2" by 11" paper. In creating the lineup arrays for this study, this author slightly enhanced the photographs from the original array through use of color photocopying to create grey scale on the black-and-white images. Sizes were also slightly adjusted.[27] The photographs were copied onto heavy card stock, separated from each other, mounted on a backing, and laminated. Velcro strips were placed on the backs. Two additional cards were added to provide nonverbal response options for "Not Here" and "Don't Know." One was a blank card, representing "Not Here." The other was a question mark, representing "Don't Know" (presented to the children as "don't know" and also explained as the "help" card, the "maybe" card, the "not sure" card, or the "mystery" card).[28]

Although the addition of the extra cards does raise issues concerning children's association of the cards with the actual answer choice, all children received basic instruction with regard to the cards. The question mark symbol is not complex. Further, the cards allow for nonverbal responses, which is of particular importance given the young age of some of the subjects.[29] In regard to

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[27] Attempts at scanning the images did not result in any increase in clarity and in fact seemed to yield a less desirable result. The actual original photographs were not available.

[28] Beal, Schmitt, and Dekle added one card to the lineup in their experimental condition. The photographs were placed linearly, with photograph order varied randomly (1995).

[29] Other options for she's not here, such as an "x" mark, might imply a wrong choice (e.g., Huneycutt, M. J., personal communication). The addition of the cards does require a learned association, which may be difficult for younger children. The use of cards as

functional size, the nonverbal response cards are not photographs but rather visual representations of already-existing response options. Wells, Leippe, and Ostrom (1979), while consulting on an actual criminal case, presented subjects with a picture of the lineup from which the defendant was identified. The subjects were given a " 'none of the above' " response option, which several utilized. Wells, Leippe, and Ostrom did not include these subjects in their calculation of the functional size (1979, p. 290).[30] The functional size in this study should not have been affected by the addition of the nonverbal response options.

Materials

General materials: Brief questionnaire for teachers (to assess exclusion criteria and to provide demographic information); brief questionnaire for parents (to assess exclusion criteria and to provide demographic information); consent forms for parents; assent forms for children aged 7 and older at the time of their participation in the study; stickers; data sheets; and instruction/protocol notebook.

Video materials: Twenty-eight 35 mm color slides converted into a video format and TV/VCR.

Color/shape verification materials: Notebook containing one sheet of paper with red, blue, green, and yellow lightning-bolt shapes and one sheet of paper with a circle, a square, a triangle, a heart, and a star (all the same purple color).

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visual cues is, however, supported by other studies. (Beal, Schmitt, & Dekle, 1995; Saywitz & Moan-Hardie, 1994).

30 The authors stated that they "did not force choices and therefore must exclude these . . . witnesses from the choice analysis" (Wells, Leippe, and Ostrom, 1979, p. 290 footnote 1).

General instruction materials: A puppet pair (Moose, Monkey, Bear, and Dog hand- puppets); white board with five cells; and three sets of training cards depicting varying colored shapes as well as the Don't Know and Not Here cards.
Training materials: Training/Control group assignment cards and six white boards, with five cells each. Three black-and-white pictures (head-shots) of men for each board; Don't Know and Not Here cards for each board; and one target picture (black-and-white picture of a man) per board (further detail provided in Procedure).
Card sort materials: 22 sets of black-and-white photographs (head-shots) of men (at least 2 pictures of each person depicted on the training boards).
Main lineup array materials: Main lineup array board (as described above and with further detail provided in Procedure), lineup assignment cards, folder with Card 1 (for lineup present arrays) and Card 2 (for lineup absent arrays), and stopwatch.
Referential communication materials: Notebook containing eight white pages, each with three colored shapes, and pairs of hand puppets (Tiger and Cow; Dinosaur and black-and-white cat (Stripes)).

Procedure

Questionnaires

Participating classroom teachers were given a Teacher Questionnaire, requesting that they identify any students in their classes who had significant difficulty speaking or understanding spoken English sentences; any participating students who required significant special education support (such as full-time aides, specialized classroom placement) to assist with mental health, behavioral, or significant academic difficulties; and any participating student with significant visual or auditory impairments that were not correctable by aids such as glasses or hearing aids or by adjustments to viewing distance or sound volume. In

situations when only a few children in a classroom were participating, the author identified the participating students for the teacher and asked the teacher to respond to the Questionnaire only as it related to the participating students (to reduce the extent to which teachers might provide information about non-participating students).

Only children whose parent(s) or guardians signed and returned the consent form were eligible for participation in the study. Parent(s)/guardians were also asked to complete the Parent Questionnaire, which asked them to provide the child's name, gender, race**,** grade, and birth date and the name of the child's teacher. The Questionnaire also asked whether their child had significant difficulty speaking or understanding spoken English sentences; required significant special education support (such as full-time aides, specialized classroom placement); or had any significant visual or auditory impairments not correctable by aids such as glasses or hearing aids or by adjustments to viewing distance or sound volume. Missing questionnaires or missing answers from teacher or parent questionnaires did not preclude participation or inclusion in analysis, as long as the information was obtained from either the teacher or the parent(s). In the case of missing or incomplete Parent Questionnaires, the author was able to obtain necessary demographic data from school records or school personnel [31]

Presentation of Video

Each child met one-on-one with the interviewer. At times, another interviewer(s) was also in the room as an observer. Children were seen in available space at their school, such as in empty classrooms or resource rooms. At times, there were interruptions by other students or school personnel. On

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31 The only information that was occasionally not obtainable was information on the child's race.

rare occasions, school personnel also observed the interactions between the interviewer and the child. This author ensured that she spent some time at each site becoming acquainted with the site and becoming, in general, a "familiar face." The interviewer met the child in his or her classroom and accompanied the child to the designated room. The interviewer talked generally with the child and gathered basic information, such as name, grade, or age. Each child was told that the author was working on a special project for school and that the child was being asked to help. Children were told that they were going to watch a video, that they would then talk about the video with the interviewer, and that the interviewer would ask them questions about the video. They were encouraged to pay attention to the video. Children were also told that they were going to look at some pictures and see some puppets. Children aged 7 years and older were specifically asked to assent to participation and to sign an assent form.

On the video, the first slide image was shown for a longer period of time in order to focus the child's attention and to allow the child to become familiar with the video. The tape was paused if the child's attention clearly diverted from the video and the child did not refocus, either spontaneously or with encouragement or redirection. The research questions focus upon the accuracy of a child's recognition of a person in a video stimulus to which the child has attended, not upon the ability of a child to attend to the video. As described, a child would not have been included in main analyses if the child refused, following redirection attempts, to remain in a position to watch the video (i.e., running around the room) or clearly failed to attend to the video following redirection (more than 3 instances, after redirection, of clear inattention to video following presentation of initial slide). Attention diversions were observed and noted by the interviewer and included such behavior as children turning their head away from the video or asking questions of the interviewer. However, a

child's comments about the video (such as commenting that the camera is missing) were not considered diversions.

Immediately following presentation of the picnic video, all children watched a musical cartoon video from the Schoolhouse Rock cartoon series as a distractor task. The cartoon, "Interplanet Janet," lasted approximately three minutes.

Following the cartoon, each child was asked to tell the interviewer what had happened in the first video. Correct answers included recognition of a picnic and recognition that a woman took something that did not belong to her (the child did not have to use the word "camera"). An example of a complete answer is "There was a picnic and a woman stole a camera." If a child's answer did not include all four concepts (woman/lady/female, taking something that was not hers/stealing, picnic, and camera), the interviewer used prompting questions. The prompting questions were designed to be as non-leading as possible and were, in general, either open-ended of forced-choice (see Appendix F, Data Collection Record Sheets, for examples). A child was credited with a sufficient answer even if he or she never specified "picnic" or "camera," as long as the concepts were described or approximated. If the child's initial answer contained none of the concepts, the interviewer also used prompting questions (including forced choice questions, such as whether there were people or animals in the video, whether it took place inside or outside, etc.). If, following prompting, a child was not able to specify that a woman took something that did not belong to her, the child continued in the experiment (after being told that the woman took something that did not belong to her) but the data from the child's responses were not included in the main analyses. Presumably, a child who could not recall, or denied recalling, the theft would not be asked by authorities to view a lineup array.

General Lineup Instructions

Following the discussion about the video, each child was asked to identify colors and shapes in order to verify his or her knowledge of colors and shapes. The interviewer clarified or taught any colors or shapes with which the child had difficulty. Each child then observeed a demonstration and received instructions about lineups. The instructions and demonstration were presented to all subjects in order to teach basic information about lineups (including that there are three possible types of answers). The demonstration was also provided in order to explain the blank card (representing Not Here) and the question mark card (representing Don't Know). The demonstration was presented through an interaction between two puppets, so that each child observed but did not directly participate. The puppets interacted minimally with the child (such as a puppet asking what the "?" was called or what the nonsense word meant (in the Don't Know array, described below). This method of presenting general instructions was designed to provide exposure, but not practice, with lineups.

During the demonstration, one puppet acted as the instructor and taught the second puppet about lineup arrays, using a white board with five cells. The board had three pictures of colored shapes (such as a circle, a triangle, and a square) in addition to the Don't Know (question mark) and Not Here (blank) cards . The three different arrays used in the demonstration are depicted in Appendix H.[32] The instructor puppet defined a lineup and explained the possible response options, including the Don't Know and Not Here cards. The student puppet was instructed to point to the picture in the array that matched

the picture on the target card, if the target picture was in the array; to point to the blank card if the target picture was not in the array (and to say "Not Here"); and to point to the card with the question mark (and to indicate Don't Know) if the puppet did not know. In addition to describing the question mark as representing Don't Know, it was sometimes also characterized as being the "maybe" card, or the "need help" card. The instructor explained that sometimes the picture for which the student was looking might not be there. The instructor also explained that the student might not be sure if the picture was there or not. Guessing was specifically discouraged.

The student puppet was then presented with three arrays: lineup present, Don't Know, and lineup absent. The presentation order of the arrays was varied between subjects, although the Don't Know array was never presented first. The witness puppet provided the correct answer (identification, rejection, Don't Know) for each array. In the lineup present and lineup absent arrays, the target cards remained visible to both the witness puppet and the child. The Don't Know array was created by having the instructor puppet ask the student to point to the picture of a nonsense word (the interviewers used "glimry" and "heffirr;"e.g., "point to the glimry."). Children observed the puppet's performance but were not direct participants (although many often "helped" the puppets on their own). The children were not asked to choose shapes from the arrays and the puppets never made an incorrect choice. After presentation of the general instructions, the interviewer opened the envelope that contained a card

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[32] The same board was used for each array and the child observed the interviewer removing the cards for each array and replacing them with the cards for the next array.

indicating whether the child was assigned to the training condition or to the control condition.

Training Condition: Training Arrays

Children in the experimental condition received specific training on lineup arrays. They viewed lineup arrays consisting of black-and-white photographs (head-shots) of Caucasian males (in order to most closely parallel the actual (main) lineup without creating possible confounds by using photographs of women). These training arrays were not designed to be "fair" lineups: the focus of the training arrays was to allow the children to practice making and expressing answer choices.

The author photographed male friends and colleagues who voluntarily consented for their photographs to be used in this study. The pictures were either taken with a digital camera or printed on film (from a 35 mm camera) and scanned so that they could be modified. Pictures were cropped so that they depicted only head-shots of men and were approximately the same size. Background details were removed where possible. Some pictures were slightly modified (e.g., removing distinctive shadowing, such as in the eyes, and making clothing into a solid color rather than a pattern). These photographs were printed on heavy card stock and laminated, with velcro strips on the back. Six white boards were created for the six training arrays, with five cells each (two rows, three spaces in the top row, two spaces in the bottom row). The cards for each board (and thus for each training array) were attached to that board and remained constant. On each board, the position of each card was varied between subjects.

All children in the training condition participated in two training trials (three arrays per trial). The photographs for each of the six arrays remained constant between children. However, the placement of the photographs within each array was varied between children. The training trial arrays are presented in Appendix I.

Each child was shown a photograph of a man and then asked to select him from lineup present, lineup absent, or Don't Know arrays. Each array consisted of five items: three photographs and the Don't Know and Not Here cards. In Training Trial 1, the child made identifications while viewing the target cards. The target cards were removed prior to the child's viewing the lineup arrays for Training Trial 2. When the child chose correctly, the interviewer verbally reinforced the child (emphasizing how well the child did in pointing out the picture that matched the target photograph or how well he or she did in looking at the array and concluding that the target was not there). The experimenter also taught through reinforcement, such as by emphasizing how well the child did at looking at every card or at deciding that the person was not in the group. The interviewer tried to incorporate the idea that some features could change more easily than others (for example, that glasses could be removed but the shape of the face was less likely to change. For the lineup present array in Training Trial 2, the target photograph and the photograph in the array were of the same person but were actually different photographs, taken at slightly different angles and in which the man had slightly different facial expressions).

In Training Trial 1, the Don't Know array was always presented second. The lineup present and lineup absent arrays were presented either first or third. For the lineup present and lineup absent arrays, the target card was a

photograph (head shot) of a Caucasian man. For the Don't Know array, the child was presented with a target card depicting only eyes (all other facial features above and below eye line had been removed). The photographs in the array all had a black stripe across the eye line. Therefore, the Don't Know response was the correct response, as it was not possible to conclude from the picture whether the person on the target card was present in the array. Methodologically, this had some limitations. The pictures had clearly been altered. Sometimes a child looked for a picture only of eyes. Attempts to create the Don't Know array by blurring the pictures, however, had proved during pilot to be insufficient for strongly suggesting a Don't Know response.

During the training trials, the experimenter used both verbal and nonverbal cues (e.g., pointing to the blank card and saying "that means that the person (target) is not here."). During Training Trial 1, if the child's first answer was incorrect, the interviewer compared the target card with the array cards and discussed with the child each comparison of the target card with each array card (e.g., "is this him?"). The child was then given another opportunity to choose from the array. If the child again made an error, the experimenter provided an explanation and the correct answer. If the child's verbal response differed from his or her nonverbal choice, the interviewer identified the inconsistency and clarified the response choice. A correct response was defined as the child responding correctly either initially or following the first redirection, in which the correct answer was not provided. In order to pass Training Trial One, the child had to be correct on 2 of the 3 arrays.

In Training Trial 2, the child was shown three different target photographs and three different lineup arrays (lineup present, lineup absent, and Don't Know

arrays).[33] The target photographs were removed prior to presentation of the lineup arrays. The three arrays were presented in varying order. For the lineup present and lineup absent arrays, the target card was a photograph (head shot) of a Caucasian man. For the Don't Know array, the target card was a photograph of the nose area, with all other features removed. However, the photographs in the actual Don't Know array were not obscured. This variation was designed to prevent any suggestion that the Don't Know option should only be chosen if the array itself was unclear. If the child responded correctly, the interviewer showed the child the target card and reinforced the response choice. At times, a child would change his or her answer upon seeing the target card, even if initially told that he or she was correct, but the initial answer was coded. If the child responded incorrectly, the child was allowed to view the target photograph while looking at the array. However, the child's initial answer was the only one that counted toward passing or failing Training Trial 2. As in Training Trial 1, a Don't Know answer was supported as a good choice across all arrays, although (unknown to the child) it was coded as incorrect in lineup absent and lineup present arrays. To successfully pass Training Trial 2, a child's initial response had to be correct on two of the three arrays.

In order to pass the training trials (overall), a child had to pass either Training Trial 1 or Training Trial 2 or both. A child who failed both training trials was excluded from most of the main analyses, although the remainder of the experimental tasks were administered and the child's responses recorded.

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[33] The target card was presented to the child, who was told to look at it carefully. The card was then removed or turned over. The interviewer then immediately presented the child with the array.

Control Condition: Card Sort Task

Subjects in the control condition engaged in a card-sorting task for approximately 5 minutes (an approximation of the duration of the two training trials). The cards used in the card sorting activity were duplicates of the photographs from the training arrays. The deck of cards presented to the child consisted of two photographs of every person used in the training trials. For the people whose photographs were used twice in the training trials, four photographs were included in the card deck. The card deck included the photographs with features removed or obscured. The Not Here and the Don't Know cards were not included. The card sort task was designed to reduce the confound of item exposure.

The cards were presented to the child, who was told that this was a special deck of cards. The child was told that there were at least two of every card in the deck. Each child was offered the opportunity to play a game of his or her choice. If the child did not identify an activity, the interviewer either suggested a game or asked for the child's help in identifying the number of people or the number of matches. The interviewer participated in the activity with the child if the child wished but remained relatively non-directive.

Description and Presentation of Main Lineup Arrays

Each child viewed a main lineup array. The arrays were presented on heavy art boards, which were created with space for the eight cards used in the main lineup arrays (two rows, four spaces for cards per row). Velcro strips marked the eight spaces, which were numbered (cells 1-8).[34] The cards in the

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34 The cell numbers were not visible to the child, as they were covered by the cards.

arrays (six photographs and two symbols) were numbered on the back (Card 1 for the target card (the perpetrator), Card 2 for the foil substitute for the lineup absent array, Cards 3 through 7 for the other photographs, Card 8 as the Don't Know card and Card 9 as the Not Here card). The arrangement of the eight cells on the main array board is presented in Figure 1.

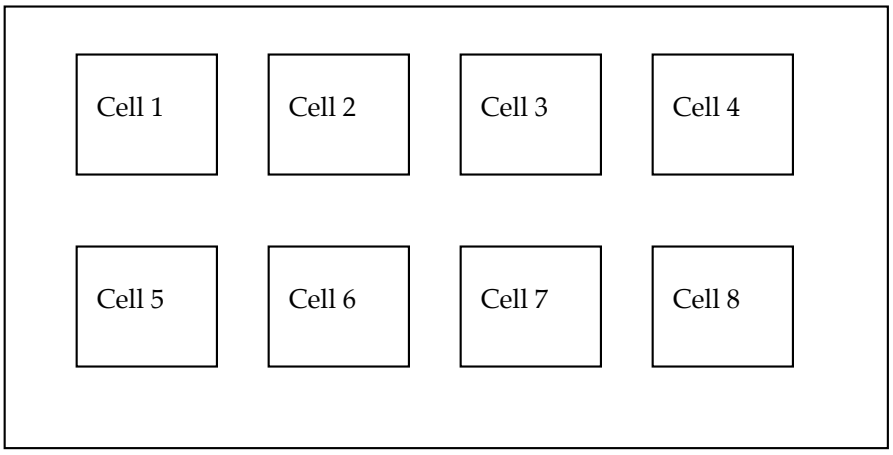

Figure 1: Cell Arrangement for Main Array

Each child was presented with either a Lineup Present main array or a Lineup Absent main array. Only one card differed between the two arrays. The Lineup Present array included Card 1 (the perpetrator) and not Card 2; the Lineup Absent array included Card 2 (the foil substitute) and not Card 1. Cards 3 though 9 were always on the board. Card 1 or Card 2 was placed on the board by the experimenter prior to the child viewing the array, in accordance with the

child's experimental group assignment. The main lineup arrays are presented in Appendix K.

The placement of the cards on the board was varied between each subject. Seven cards were always placed on the board prior to a child entering the room. The eighth card (Card 1 in Lineup Present, Card 2 in Lineup Absent) was placed on the board immediately prior to presentation of the array to the child (as discussed further in this section). When varying the placement of the cards, in some instances the experimenters removed the cards, shuffled them, and placed them on the board without focusing on the placement position of the cards. However, specific attention was frequently given to the placement of certain cards: Card 8 (Don't Know), Card 9 (Not Here), Card 7 (foil), and the location of the empty cell (where either Card 1 or Card 2 would be placed). The Don't Know card, the Not Here card, and the target card were the possible correct responses (as is discussed further in Results, the correct response depended on whether the array was Lineup Present or Lineup Absent). In regard to Card 7, during this study the interviewers noted that this seemed to be the foil card most often chosen by the children (the frequency with which each card was chosen is discussed further in Results). In order to attempt to avoid potential confounds of placement location, this author deliberately attempted to ensure variation in the location of these cards on the board (e.g., top or bottom row, middle or outside positions) and in relation to each other and to other cards (e.g., sometimes placing the Don't Know card next to Card 1 and sometimes separating them; sometimes placing Card 1 next to Card 7 and sometimes separating them).

All children were given instructions before viewing the main lineup array. The instructions included statements that the child was going to view a lineup

array that would have pictures of women. Children were told that the women in the pictures were going to look a lot alike. Children were asked to look at the array to determine if a picture of the woman who took the camera was in the array. They were specifically told that, if the picture was there, they should identify her (point). Children were explicitly told that the woman's picture might not be there and that these might be pictures of other women, in which case they should verbally state that the woman was not there and/or point to the Not Here card. Children were discouraged from guessing and were reminded that, if they did not know whether the woman was in the array or if they needed help or more information in making a choice, they could say "I don't know" and/or point to the question-mark (Don't Know) card. Children were encouraged to take their time and to look at every picture. The experimenter then asked the child if he or she had any questions.

After providing the instructions, the interviewer opened the envelope that provided information on assigned lineup condition. The interviewer placed the appropriate card (Card 1 for Lineup Present or Card 2 for Lineup Absent) on the array board. Both the card and the array board remained shielded from the child's view. The interviewer placed the lineup array in front of the child and again told the child to point to the woman who took the camera if she was there.

If children's verbal responses differed from their nonverbal choices, the interviewer clarified the response choice. Children were permitted to spontaneously correct or change an answer. Although the second answer was coded, all answers were recorded. Children were never told whether they were correct or incorrect and, if they asked, the interviewer in general denied having had a good view of the woman.

However, there was some variation in the interviewer's response to the child's identification if the child appeared to be confused or to be questioning his or her choice or if the child made multiple responses spontaneously, while the array was still visible to him or her (generally, if the array had already been removed, the interviewer continued with the next task). At times, this author attempted to clarify a child's choice if, based upon the child's comments or responses while the array was still visible (or in rare cases immediately after it had been removed, if the child indicated that he or she wished to see it again), the interviewer concluded that there was some discrepancy or uncertainty in the child's answer. This was most often the case when the child seemed to have been confused between the Don't Know and the Not Here cards or when the child made some verbal comment or nonverbal gesture that seemed inconsistent with their answer. The interviewer tried to use non-leading questions (such as, "You've pointed to this card and to this card. You can pick a photograph if you see her, decide that she's not there, or tell me if you're not sure. Which one do you want to choose as your best answer?").

The interviewers attempted to record, to the tenth of a second, the response time from when the array was placed in front of the child until the child made a verbal identification response or pointed to one of the cards. The experimenters wore stopwatches. If the child made multiple responses, the interviewer tried to restart the timer.

Referential Communication Task

All children participated in a referential communication task that was designed to assess their level of comprehension monitoring. It was hypothesized that children who have made the cognitive shift to successful monitors ("speaker

blamers") would have improved accuracy on lineup identification in response to the lineup training. Therefore, the communication task was administered after the lineup tasks in order to prevent potential experimenter bias from affecting the lineup procedures. Beal, Schmitt, and Dekle (1995) found no effects of task order with regard to presentation of the slide show and identification task and the referential communication measure.

The referential communication game presented has been used in previous research by Beal, Schmitt, and Dekle (1995) and by Huneycutt (1992). It follows the model set forth by Bonitatibus (1988). Puppets were used as the "speaker" and the "listener." The puppet roles (speaker and listener) remained constant within subjects but varied between subjects. This variation was to avoid a potential compound of bias, in that a child might simply prefer one puppet over another. Each interviewer worked with one "pair" of puppets.

In this task, each array consisted of three items. The items were shapes (such as circle, square, triangle) of varying colors (such as blue, red, green, yellow). Children's knowledge of these shapes and colors had been assessed earlier. Every array contained two variations of a shape or a color (e.g., two red shapes, two round shapes). For each array, the speaker presented a clear, an ambiguous, or a misleading instruction to the listener, who was supposed to select the specified target picture. An example of an ambiguous message was an instruction to "pick the red one" when two red shapes were present in the array. An example of a misleading message was to "pick <u>any</u> red one," when two red shapes were present in the array (considered misleading because the speaker specified multiple referents as opposed to a single referent). When the listener made an incorrect choice after ambiguous and misleading messages, the child

was asked to determine who (the speaker or the listener) made the error and what additional "help" the speaker could have provided (Bonitatibus, 1988). Sample arrays from this task are presented in Appendix J.

The task was introduced to the children with three examples, utilizing three separate arrays. In the first example, the speaker gave clear directions (point to the red circle) and the listener chose correctly (by pointing to the red circle). The interviewer explained that the puppets were both correct. In the second example, the speaker presented an ambiguous message (point to the blue shape). The listener chose one shape of the two possible shapes that were consistent with the direction and the speaker indicated that he had wanted the other shape (i.e., the listener chose the blue heart; the speaker pointed to the blue triangle and indicated that he had wanted the blue triangle). The interviewer presented an explanation. In the third example, the speaker presented a clear message; the listener made an error; and the speaker indicated that another choice was intended (e.g., the instruction was to point to the yellow square and the listener picked the green square). The interviewer again provided an explanation.

Each subject then participated in five trials, viewing five separate arrays. The arrays, the trial order, the directions given, and the item chosen by the listener remained the same across all subjects.[35] The second and the fifth trials consisted of clear directions, to which the listener made a correct choice. The first and fourth trials consisted of ambiguous messages in which the listener made the

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35 Some variations as a result of human error did occur but do not affect this task, as the shapes chosen and directions given can vary provided they fit the parameters of the given array. For example, if the Listener is supposed to choose the green triangle and chooses the green square, the Speaker puppet merely chooses the other one.

"wrong" choice. On the third trial, the speaker presented a "misleading" message (choose any blue shape) but again indicated a different choice than the listener. This message is considered misleading because the speaker specified choosing any shape (thus multiple referents) as opposed to the shape (single referent) (see Bonitatibus, 1988).

When the speaker and listener disagreed on the shape selected, the child was asked to identify which puppet made the mistake. The child was then asked what else the "mistaken" puppet should have done (such as, how could the speaker help the listener puppet? What else could he/she say?). Bonitatibus (1988) also indicated that a follow up question would then be what else the speaker could have said. Experimenters were inconsistent in using this clarification, which resulted in some ambiguity in interpreting children's responses. For example, if a child said that the speaker should "point to the yellow circle," it was not clear upon later review what the child meant. The child could have been indicating that the speaker should say "point to the yellow circle" or indicating that the speaker should have actually pointed to the yellow circle when it was the speaker's turn to choose. As this ambiguity was considered to be an experimental design error, children's answers were coded in a light most favorable to them (so that "point to the yellow circle" would be coded as a correct verbal response, unless there were clear indications that the child had indicated this to be a gesture and not a verbalization). Similarly, if a child's response contained an error in color or shape (e.g., "he should have said point to the green circle" when the speaker should have said "point to the yellow circle"), the answer was viewed in the child's favor and coded correctly so long as the answer referred to color and/or shape. The task was not intended to test

memory but rather to assess whether a child could identify the problem when there was a communication failure.

Following Bonitatibus' system (1988), children's level of comprehension monitoring was determined based upon their responses to the two ambiguous trials. They were classified as successful monitors, or speaker blamers, if they accurately indicated that the speaker was responsible for the communication errors and if they specified the reason for the communication failure or what component(s) were missing from the directions. Children were classified as poor monitors, or listener blamers, if they attributed blame to the listener on both trials or if they attributed blame to the speaker but did not correctly identify what was missing from the directions. Children who responded correctly to one trial and incorrectly to another were classified as transitional.

Children's responses to the misleading message did not affect their classification as successful monitors or poor monitors. Bonitatibus (1988) found that successful monitors were able to accurately identify the speaker's error in the "misleading" message but generally made no distinction between the problem in the misleading message and the difficulty with the ambiguous message. He found that poor monitors were unable to identify the problem in the misleading message (Bonitatibus, 1988).

Completion of Tasks

All children were offered a sticker(s) upon completion of all tasks. The interviewer offered the child an opportunity to ask questions and, time permitting, to see the puppets. The interviewer then returned with the child to his or her classroom.

Chapter 3: Variables of Interest and Hypotheses

Dependent Variables

The "dependent variable" in the main analyses is the children's response accuracy on the main lineup array. The three levels of this variable are correct, incorrect, and Don't Know responses. Although accuracy is a response variable, it is important to note that loglinear analysis (the main statistical analyses for most of the data) "treats independent and dependent variables alike, ignoring the distinction between them" (Howell, 1992, p. 577). However, as noted by Howell, interpretation is based "in part on whether a variable is seen, by us, as independent or dependent" (Howell, p. 577). Therefore, although accuracy is identified, and referred to, as the "dependent" variable, this does not imply that it is treated differently than other variables within the loglinear analysis itself.

Children's responses to the referential communication task (speaker blamer/listener blamer) are dependent variables for the comprehension monitoring task. However, their comprehension monitoring (successful, poor, or transitional monitors) is also an organismic variable reflecting a developmental level. Response time is an additional dependent variable that was examined in one analysis.

Independent Variables

The independent variables are: lineup type (Lineup Present, Lineup Absent) and experimental condition (Training group or Control (card sort) group).

Organismic and System Variables

These variables, which are not under experimental control, include comprehension monitoring (successful, poor, and transitional monitors); gender (male, female); age; and grade (school grade).

Number of Participants

In order to have sufficient expected frequencies, the target number of subjects was 120 children (who could sufficiently identify video contents, who completed all tasks, and passed both training trials (if in the training group)). In order to account for drop-outs, subjects who must be excluded from some or all analyses, pilot subjects, and children whose parents declined to consent, the initial plan was to recruit at least 160 children. This number was later increased to 200 when the third site (UJC) was added, in order to ensure that all children whose parents returned consent forms and who wished to participate would be able to do so.

Although very few consent forms were returned as explicitly rejected, the overall rate of return was somewhat lower than had been anticipated. Therefore, although the number of potentially available children at the three sites would have met or exceeded the target number, the author was unable to enroll 160 children. In an attempt to assess any concerns with the forms or the project, the author did speak with staff members at each site who were also parents. Based upon these conversations, possible reasons for parents not returning consent forms included thinking that they had done so when they had not; concerns over exposing very young children to the concept of stealing; concerns with a child's particular needs; concerns with a child interacting with an unknown, non-staff member when not in the presence of school staff; and concerns with removing a child from the classroom experience. These reasons should not be viewed as representative, as they are based upon anecdotal data, but they nevertheless provide some helpful information.

Hypotheses

1. Lineup condition (Lineup Present, Lineup Absent) will have a significant effect on accuracy. Overall, children will make more errors in the lineup absent condition.[36]

2. Age will have a significant effect on accuracy, although this effect may not be linear and will interact with other factors. Overall, older children will perform more accurately than the younger children across all conditions but with a greater difference in the Lineup Absent condition.

3. Children in the training group will make fewer errors in the Lineup Absent condition and will increase their use of the Don't Know response. Performance in Lineup Present conditions will improve or remain the same.

4. Age and level of comprehension monitoring (successful, poor, or transitional monitors) will interact with effects of training. Developmentally, younger children may not be able to improve their response accuracy, even when nonverbal response options are included.

5. There will be no significant difference in the response times of children who make correct, incorrect, or Don't Know responses.

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[36] In this study, false positive or foil identification are both used to refer to any photograph other than the correct (target) photograph, the Not Here card, or the Don't Know card. This study does not distinguish between the "known" and "unknown" suspects, or between foil and false identifications, in the lineup absent condition.

Chapter 4: Results

Completed Consent Forms

One hundred forty-nine signed consent forms, representing 142 children, were returned from the three sites. Multiple consent forms were returned for seven children, accounting for the difference between the 149 forms and the 142 participants. Some of the children participating in this study also had sibling(s) who participated.[37]

Of the 142 children, 10 were withdrawn from the study. Of these 10 withdrawn subjects, two children were outside of the age range.[38] For one child, the returned consent form contained a hand-written note on every page that stated "under strict supervision of [the site]." As the experimenter wanted to ensure that this parent understood and agreed with the consent form and with his or her child's participation, the consent form was returned to the parent with a note explaining the conditions under which children were seen at that site. Although the parent was given the opportunity to return the consent form again, the parent did not do so during the time of this study and therefore this child was withdrawn as a possible subject. No further information regarding these three children will be presented in this study.

For the remaining seven children who were withdrawn, completed consent forms were returned toward the end of the 2002-2003 school year, when data was being collected at Trinity. In some cases, the form was returned during

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[37] Information regarding siblings was not requested on any of the data forms and therefore exact numbers of sibling pairs are not available.

[38] The experimenter made every effort to ensure that information packages were given by the schools only to children who were within the age range.

or after the last days of school. The school year ended before these children could participate and, for a variety of reasons, the seven children were not able to participate during the 2003-2004 school year.[39] These seven children ranged in age from 4 years, 9 months to 9 years, with a mean age of 7.53 (years and fractional years; approximately 7 years, 6 months).[40]

Exclusionary Criteria

One child was excluded from inclusion in the main analyses based upon the Parent Questionnaire. This child is one of the 12 pilot subjects.[41] No children were excluded based upon Teacher Questionnaires. As discussed earlier, the UJC did not provide information packets to students whom they felt would meet exclusionary criteria. No children from the participants who are considered in main analyses were excluded by the experimenters from inclusion on the basis of behavior(s) or persistent inattention to the video. A small number of children who exhibited significant difficulty in paying attention to the video were in the

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[39] In some cases, the child was either out of the age range or was in a non-participating classroom during the 2003-2004 school year. For some children, new consent forms were not returned.

[40] For the withdrawn children, age was calculated based upon the date the consent was signed. For the oldest child, the consent was signed, which was two weeks prior to the child's ninth birthday.

[41] Methodologically, this child's inclusion as a pilot subject was unusual, as he was Asian and thus a member of a minority group in this study. The experimenter attempted not to schedule children who were members of a minority group to participate as pilot subjects, in order to maximize available racial diversity within the main sample. Both experimenters were in the room while this child participated in the study and, at first, were not aware that this child met exclusionary criteria based upon the Parent Questionnaire. This child was seen by the second experimenter as a pilot subject after he had been unable to identify video contents and therefore was excluded from main analyses.

Pilot Group or were excluded based on inability to accurately identify the video content.

Pilot Subjects

Twelve of the 132 participating children took part in the study as pilot subjects. Six of these children were seen for the study by this author and six children were seen by Ms. Chisman. There were five female subjects and seven male subjects in the pilot group. All but one of the pilot subjects were students at Trinity; one was enrolled at Bright Horizons. Eleven pilot participants were Caucasian and one pilot participant was Asian. Pilot subjects represented all grade levels except for third grade: there were three children from preschool (one from a three-year-old class and two from four-year-old classes), three children from kindergartens, three children in first grade, and three from second grade. The entire age range was represented within the pilot group, with at least one child from each of the age groups (e.g., at least one 3-year-old, at least one 4-year-old, at least one 5-year-old, etc.).[42] The youngest child was 3 years, 10 months and the oldest was 8 years, 4 months. The average age of the pilot children was 6.5 years (approximately 6 years, 6 months).

Subjects with Incomplete Data

Of the 120 children who participated in the main study, 112 completed the study and 8 discontinued. Of these eight participants, five discontinued at the child's request (such as wanting to return to the classroom). Three discontinued due to external factors, such as needing to leave because their parent arrived to

[42] Due to incomplete recording on data sheets, age calculations for two pilot subjects were not based on the difference between date of participation and birth date. For one pilot subject, age was calculated based upon the date the consent form was signed and for one pilot subject, age was calculated based upon an estimated date of participation.

take them home. Six male children and two female children discontinued. Six were Caucasian, one was African American, and one was Asian. Three of the children who discontinued were students at Trinity, four were enrolled at Bright Horizons, and one was enrolled at the UJC. Of these eight children, five were in preschool, one was in kindergarten, one was in first grade, and one was in second grade. They ranged in age from 3 years, 4 months to 7 years, 8 months, with an average age of 4.79 years (approximately 4 years, 9 months).

Subjects who discontinued were not included in any main analyses. Subjects who completed all sections of the study through the main array (but did not complete the referential communication task) were considered to have completed the study and were treated as having missing (as opposed to incomplete) data.

Subjects Who Could Not Identify Video Contents

Of the 112 subjects with complete data, 13 subjects were not able to identify that a female (woman/girl) took someone else's camera and/or did not demonstrate knowledge of shapes and colors used in the experimental tasks. Of these 13 subjects, 10 did not verbally report that a female (woman/girl/"she") took a camera that did not belong to her.[43] Some of the 10 subjects were able to describe few, if any, relevant concepts from the video. Others identified most, but not all, of the required concepts (for example, describing a picnic, taking pictures with a camera, and a woman walking away but not describing that the woman took anything that was not hers).

[43] Children who correctly identified that a woman took a camera that was not hers, but did not specify that this happened at a picnic, were included in the main analyses.

Two of the 13 subjects were excluded because they could not identify shapes and colors used in the experiment, even after the experimenters provided the correct answers.[44] Failure to accurately identify colors and shapes was not one of the exclusionary criteria provided in the methods for this study. However, a lack of knowledge of the basic shapes and colors used in this experiment would affect too many aspects of the protocol to permit these children to be included in analyses. Lack of such knowledge could affect the general instructions provided to all children (which utilized shapes and colors) and the referential communication task. One of the thirteen subjects was able to identify the appropriate concepts from the video but only after extensive prompting. This child was excluded because too many leading prompts were used before the child identified the required concepts.

The thirteen children were fairly equally divided among the four experimental groups. Four children were assigned to Group 1 and four children to Group 4; two were assigned to Group 2 and three to Group 3. Interestingly, on the main lineup array, four children made correct responses, one made a Don't Know response, and eight made incorrect responses.[45]

Nine of the 13 children who were excluded were female and four were male. Ten of the 13 children were Caucasian, one was African American, and one was Asian. Eight of the children were students at Trinity, three were at

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[44] One of the two children who could not identify shapes and colors was unable to describe a sufficient number of concepts from the video and the other child was on the "borderline" for identifying the appropriate concepts.

[45] As these children had not identified a woman as taking a camera/something that did not belong to her, the directions given to the children in regard to the main array varied. For example, some were asked to find the woman who took something that did not

Bright Horizons, and two were at the UJC. The most consistent characteristic among the 13 children was their age. Six were in 3-year-old preschool, six were in 4-year-old preschool, and one was in kindergarten. The thirteen children ranged in age from 3 years, 4 months to 6 years, two months, with an average age of 4.40 fractional years (4 years, 5 months). On the referential communication task, eight were poor monitors and two were successful monitors.

Subjects with Complete Data

Table 3 presents a summary of the information presented above regarding the 142 students with completed consent forms.

Table 3

Summary of Participation of 142 Subjects with Returned Consent Forms

Number of subjects	Type of participation
10	Withdrawn
12	Pilot subjects
8	Main study participants, data incomplete
13	Main study participants, unable to identify video content
99	Main study participants, complete data
142 subjects	

Ninety-nine children participated in the main study, had complete data, and were able to sufficiently identify the video components. These 99 subjects are the

belong to her while others were given directions more related to their verbal description

primary focus of this research study, as they are the children whose data can be appropriately analyzed and who would, in the "real world," have been presented with a lineup array and asked to identify the "perpetrator," as they were able to provide information that a woman took something that did not belong to her. Therefore, analyses of random assignment and descriptive analyses have been conducted on the data from the 99 subjects.[46] Following presentation of information regarding random assignment and descriptive analyses, a comparison is presented between those subjects who were included in main data analyses and those who were not. As will be described below, four additional subjects were methodologically excluded from consideration in main data analyses as a result of their performance on the training trial arrays. All data were analyzed using either SPSS 10 for Macintosh or SPSS 11 for Macintosh.

Random Assignment to Experimental Groups

Random assignment was designed to control the number of participants assigned to the four experimental groups. There was some variation in the numbers within each experimental group. Variations resulted from several factors, including experimenter error, the available number of male and female children in each grade, the random nature of random assignment, and to the "removal" from groups as a result of a participant being a pilot subject, withdrawing, having incomplete data (discontinuing), or being unable to identify the video contents. The number of children in each of the four experimental groups results are presented in Table 4.

(such as to look for the woman who left because she was sad).

Table 4

Frequency of Subjects in Experimental Groups

Group 1 LP/Training	Group 2 LA/Training	Group 3 LP/Control	Group 4 LA/Control
28	24	26	21

N = 99; LP = Lineup Present, LA = Lineup Absent

There is no significant difference in the number of subjects among the experimental groups, $\chi 2$ (3) = 1.081, $\underline{p}$ = .782, ns. As there were slightly different frequencies within each of the four experimental groups, analyses were conducted to determine whether there were any significant differences in the number of subjects who participated in each lineup condition and in each experimental condition. Fifty-four children participated in the lineup present condition and 45 participated in the lineup absent condition. Fifty-two children participated in the training condition and 47 participated in the control condition. There were no significant differences in the number of children in the lineup conditions, $\chi 2$ (1) = .818, $\underline{p}$ = .366, ns, or in the number of children in the experimental conditions, $\chi 2$ (1) = .253, $\underline{p}$ = .615, ns.

Table 5 presents the number of male children and female children in each of the four experimental groups.

[46] It is important to note that random assignment was always completed prior to a child being seen in the experiment.

Table 5

Frequency of Subjects by Gender in Experimental Groups

	Group 1 LP/Training	Group 2 LA/Training	Group 3 LP/Control	Group 4 LA/Control
Female	17	11	13	17
Male	11	13	13	4

N = 99, LP = Lineup Present, LA = Lineup Absent

There is no significant difference in the number of male subjects and female subjects between experimental groups, $\chi 2$ (3) = 6.781, p = .079, ns. However, an examination of the frequencies reflects some apparent differences in the number of male and female participants within Group 1 and within Group 4. Chi-square analyses within each of these two groups reflected a significant difference in the numbers of male participants and female participants within Group 4, $\chi 2$ (1) = 8.048, p = .005, with significantly more females than males (for Group 1, $\chi 2$ (1) = 1.286, p = .257, ns).

Descriptive Analyses

Racial Identity

Analyses of participants on the basis of racial identity (Caucasian; African American; Asian; and other, including multiracial) was not possible due to the low number of participants who were not identified as Caucasian. The frequency of participants' racial identity (as provided by the parent on the Parent

Questionnaire or the school if the parent did not provide the information) is presented in Table 6.

Table 6

Racial Identity of Participants

Number of Subjects	Racial Identity
89	Caucasian
5	Asian
5	Other

Among the participants identified as "Other," one (1) was identified as Barbados/Caucasian mixed; one (1) as Mixed; one (1) as Biracial—Caucasian/African-American; and one (1) was specifically noted on the Parent Questionnaire as "Other/WASP." For the fifth participant coded as "Other," information was not provided by the parent. The site at which that child was enrolled did not collect data on racial identity and the staff did not agree on the child's race. Therefore this child's racial identity was not available and was coded as "Other."

Home School and Interviewer

Of the 99 children with complete data, 70 were from Trinity Lutheran School (Trinity), 14 were from Bright Horizons Learning Center (Bright Horizons) and 15 were from the United Jewish Community of the Greater Virginia Peninsula (UJC). The variable of the site at which the children were enrolled is not included in analyses due to the large differences between the number of children who participated at Trinity and the number from Bright Horizons and the UJC. Ms. Huneycutt was the interviewer for 91 participants

and Ms. Chisman for 8.[47] The variable of interviewer, therefore, is also not included in further analyses.

Grade

Subjects ranged from preschool children to third-graders. The numbers of children within each grade level are presented in Table 7.

Table 7

Number of Participating Children in Each Grade

Number of subjects (n = 99)	Grade
10 (10.1%)	Preschool 1 (TLS 3 year olds, Bright Horizons Chipmunks and Bluebirds, UJC 2 year old and 3 year old)
16 (16.2%)	Preschool 2 (TLS 4 year olds, Bright Horizons Lions and Tigers, UJC 4 year olds)
27 (27.3%)	Kindergarten
26 (26.3%)	First grade
13 (13.1%)	Second grade
7 (7.1%)	Third grade

[47] Three people were certified as key personnel for this study in order to assist with data collection. Although this author planned to have more assistance with data collection, circumstances beyond anyone's control limited the ability of the key personnel to participate in data collection.

Age

The 99 subjects ranged in age from 3 years, 8 months to 8 years, 11 months. The average age is 6.33 years (expressed in years and fractional years), which converts to 6 years, 4 months.

Although random assignment controlled for age, a one-way ANOVA confirmed that there were no significant differences in age among the four experimental groups, $F(3, 95) = 1.851$, $p = .143$, ns.. The assumption of homogeneity of variance was met, Levene's statistic $(3, 95) = .001$, $p = 1.00$, ns.

As expected, age (calculated using fractional years) and grade (calculated using grade level and months in that grade (e.g., first grade, third month) are highly correlated: Pearson $r = .958$, $p < .001$.[48]

Card and Cell Selection on Main Array

The majority of the main analyses focus upon the accuracy of children's responses on the main lineup array (the array with six photographs of women and the Don't Know and Not Here cards). As described in Methods, the main lineup array consisted of eight cards placed in eight cells on the array board. Between subjects, the experimenters varied the placement of the main array cards among the cells. The variation in the placement of the main array cards was designed to minimize any effects of cell preference. For all cells except Cell 4, the range (in the number of times the cell was chosen) was from 11 to 16 (e.g., Cell 1 and Cell 8 were chosen 11 times each and Cell 7 was chosen 16 times). Cell 4 was only chosen 5 times. There was no significant cell preference, $\chi 2\ (7) = 7.10$, $p = .418$, ns. Therefore, when analyzing the children's response choices, the

analyses and interpretation focus upon the actual card that the child selected without concern for the location of that card within the array. The design goals of having each card vary in its location on the array between children and to have each card occur at each cell location were met. Every card occurred at least once in every cell in both Lineup Absent and Lineup Present conditions. Table 8 presents the frequencies with which the correct card, the Don't Know card, and the Not Here card occurred in each of the eight cells in the Lineup Present condition (Lineup Present n = 54).

Table 8

Frequency of Placement of Card 1 (Correct/Target), Card 8 (Don't Know), and Card 9 (Not Here) Within Each Cell in the Lineup Present Condition

	Type of Card		
Cell Number	Card 1 (Correct/Target)	Card 8 (Don't Know)	Card 9 (Not Here)
Cell 1	2 (3.7%)	5 (9.3%)	3 (5.6%)
Cell 2	5 (9.3%)	9 (16.7%)	8 (14.8%)
Cell 3	7 (13.0%)	3 (5.6%)	14 (25.9%)
Cell 4	5 (9.3%)	8 (14.8%)	6 (11.1%)
Cell 5	9 (16.7%)	8 (14.8%)	4 (7.4%)
Cell 6	8 (14.8%)	10 (18.5%)	8 (14.8%)
Cell 7	13 (24.1%)	9 (16.7%)	6 (11.1%)
Cell 8	5 (9.3%)	2 (3.7%)	5 (9.3%)
Totals:	54	54	54

[48] As data was collected throughout the calendar year, the months a child had been in a particular grade were coded. This permitted distinctions to be made between a child in their first month of a particular grade and a child who was about to complete that grade.

In the Lineup Present condition, the correct card was Card 1. Card 3 through Card 7 were foils. Card 8 was the Don't Know card and Card 9 was the Not Here card (an incorrect choice, as a false rejection, in the Lineup Present condition). Figure 2 represents the frequency with which each of the eight response cards was chosen by children in the Lineup Present condition.

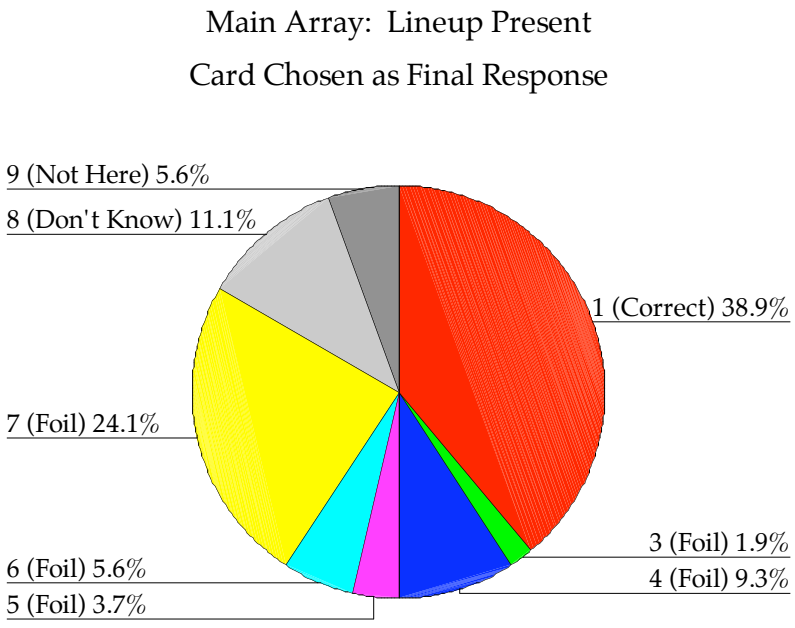

Figure 2: Card Chosen as Final Response for Main Array in Lineup Present Condition

Table 9 presents the frequencies with which the Not Here card (the correct card in the Lineup Absent condition) and the Don't Know card were in each of

the eight cells in the Lineup Absent condition (Lineup Absent n = 45). In the Lineup Absent condition, the correct card was Card 9. Cards 3 through 7 were foils. Card 8 was the "Don't Know" card. Card 2 was the "suspect" card (a false identification). However, the most frequently chosen card in the lineup absent condition was Card 7 (which was also the second most frequently chosen card in the Lineup Present condition). While the choice of Card 7 is a foil identification error, the frequency with which it appeared in each cell is included in Table 9, as Card 7 seems to have been viewed by the children as more similar in appearance to the perpetrator. Figure 3 represents the frequency with which each of the eight response cards was chosen by children in the Lineup Absent condition.

Table 9

Frequency of Placement of Card 2 (Incorrect/Foil), Card 7 (Incorrect/Foil), Card 8 (Don't Know), and Card 9 (Not Here/Correct) Within Each Cell in the Lineup Absent Condition

	Type of Card			
Cell Number	Card 2 (Incorrect/False)	Card 7 (Incorrect/Foil)	Card 8 (Don't Know)	Card 9 (Not Here/Correct)
Cell 1	4 (8.9%)	7 (15.6%)	3 (6.7%)	1 (2.2%)
Cell 2	5 (11.1%)	4 (8.9%)	8 (17.8%)	10 (22.2%)
Cell 3	9 (20%)	7 (15.6%)	7 (15.6%)	5 (11.1%)
Cell 4	10 (22.2%)	12 (26.7%)	4 (8.9%)	3 (6.7%)
Cell 5	7 (15.6%)	3 (6.7%)	6 (13.3%)	3 (6.7%)
Cell 6	4 (8.9%)	3 (6.7%)	5 (11.1%)	8 (17.8%)
Cell 7	3 (6.7%)	6 (13.3%)	9 (20%)	7 (15.6%)
Cell 8	3 (6.7%)	3 (6.7%)	3 (6.7%)	8 (17.8%)
Totals:	45	45	45	45

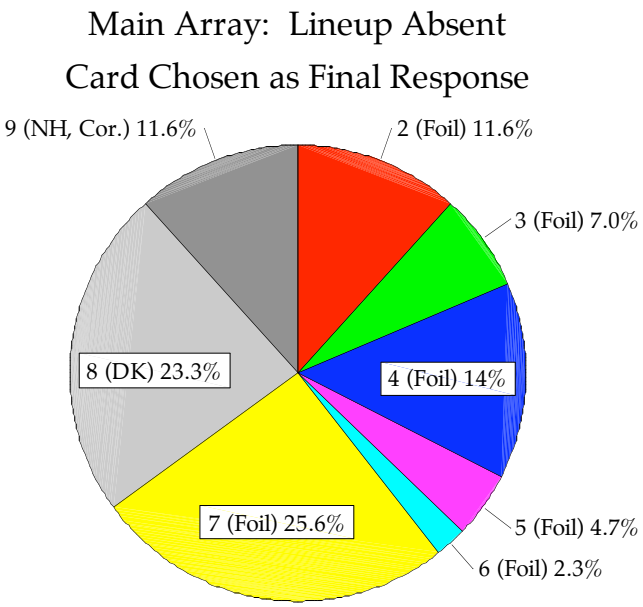

Figure 3: Card Chosen as Final Response for Main Array in Lineup Absent Condition

Training Condition: Performance on Training Trials

The 52 children assigned to the training condition each completed two training trials. As discussed in Methods, three arrays were presented in each training trial: Lineup Present, Don't Know, and Lineup Absent arrays. In order to pass each training trial, each child had to be correct on two of the three arrays. Forty-eight children (92.3%) passed Training Trial 1. Of these, 19 children (36.5% (19 / 52)) passed Training Trial 2. No child who failed Training Trial 1 subsequently passed Training Trial 2. Therefore, 48 children passed the training trials overall and 4 children failed both training trials.

Of the four children who failed both training trials, two were in Experimental Group 1 (Lineup Present, Training) and two were in Experimental

Group 2 (Lineup Absent, Training). Three were male participants and one was a female participant. On the main array, one made a correct identification and three were incorrect. On the comprehension monitoring task, two were successful monitors, one was a poor monitor, and one was transitional. The age range of these four children was 4 years, 8 months to 7 years, 2 months, with an average age of 6.17 years (approximately 6 years, 2 months).

Consideration was given to including these four children in the main analyses, as the types of errors that the children made on the training arrays included use of the Don't Know response in either the Lineup Present or Lineup Absent arrays. Although reinforced as a good choice, the Don't Know answer was coded as incorrect. However, these children failed to correctly answer two of three arrays in either training trial. As discussed in the Methods section, the experimental design provided for exclusion from main analyses for children who failed both training trials. As they have been exposed to the training trials, they cannot be considered to have had the same experience as the children in the Control Group. However, there is also no evidence that they successfully completed, or understood, the training. Therefore, based upon the methodology and the pre-established criteria for this study, these four children were excluded from further analysis.

Comparison of Subjects Included in Main Analyses and Subjects Excluded from Main Analyses

Of the 139 children[49] who could participate in this research study, 95 subjects (68.3%) were included in the main analyses and 44 subjects (31.7%) were excluded for methodological reasons as outlined previously. The 44 subjects who were excluded from main analyses consisted of subjects who were in the Pilot Group; who could not identify video components or shapes/colors; who had incomplete data (discontinued); who were withdrawn from the study (not seen); or who failed both training trials. Comparisons between the included subjects and the subjects who were excluded have been conducted in order to assess whether these two groups of subjects significantly differed on age or gender. In addition, Table 10 presents information regarding the racial identity of included and excluded subjects.

[49] The two children who were withdrawn because they were outside the age range and the child withdrawn because of the concerns with the validity of the parent's consent are not included.

Table 10

Racial Identity of Subjects Included in and Excluded from Main Analyses

Child's Race	Included in Main Analyses	Excluded from Main Analyses
Caucasian	86 (90.5%)	36 (81.8%)
African American	0 (0%)	3 (6.8%)
Asian	5 (5.3%)	4 (9.1%)
Other	4 (4.2%)	1 (2.3%)

Of the 3 African American children, one was not seen (withdrawn); one was unable to identify video content; and one had incomplete data (discontinued). The percentages given above are column percentages.

Table 11 represents the distribution of males and females among the subjects who were included in and excluded from main analyses. There is no significant interaction between gender and inclusion/exclusion in main analyses, $\chi 2\ (1) = 2.58$, $p = .11$, n.s.

Table 11

Gender of Subjects Included in and Excluded from Main Analyses

Child's Gender	Included in Main Analyses	Excluded from Main Analyses
Female	57 (60%)	20 (45.5 %)
Male	38 (40%)	24 (54.5%)

The percentages given above are column percentages.

Table 12 presents the mean age (in years and fractional years) of the children included in and excluded from main analyses. A t-test for independent samples was conducted to determine whether there were significant differences in mean ages of the included and excluded subjects. The assumption of homogeneity of variance was violated, Levene's $F = 5.85$, $p = .017$. The t-test for unequal variances revealed a significant difference in age between the two groups, $t(69.57) = 2.131$, $p = .037$. The children who were excluded from the main analyses were significantly younger than those who were included.

Table 12

Mean Age of Subjects Included in and Excluded from Main Analyses

Included in Main Analyses	Excluded from Main Analyses
6.34 years	5.70 years

A one-way analysis of variance (ANOVA) was conducted to examine whether there are differences in mean ages between the specific groups of subjects (e.g., Included subjects, Pilot Group, the group that failed to identify video content, etc.). Table 13 presents the mean ages of these groups. An ANOVA is not robust to violations of the assumption of homogeneity of variance when there are unequal sample sizes (see, e.g., Howell, Chapter 11, 1992, pp. 307-308). Although the sample sizes in this analysis are not equal, the assumption of homogeneity is not violated, Levene's statistic (5, 133) = 1.376, $p = .237$, n.s. There are significant differences in age between the groups of subjects, $F(5, 133) = 7.591$, $p < .001$. Post hoc analysis with the Tukey Honestly Significant Difference (HSD) test was conducted to determine between which groups were the mean ages significantly different. There were significant differences in the mean ages between the Included subjects and the group that was unable to identify video contents, Tukey HSD = 1.94, $p < .001$, and between the Included

group and the group with incomplete data (discontinued), Tukey HSD = 1.55, $p < .033$.[50]

Table 13

Mean Age of Subjects in Specific Groups Included in and Excluded from Main Analyses

Group	N	Mean Age in Years
Included	95	6.34
Excluded, fail training trials	4	6.17
Excluded, unable to identify video contents	13	4.40
Excluded, incomplete data (discontinue)	8	4.79
Excluded, Pilot Group	12	6.50
Excluded, Withdrawn	7	7.53

Main Analyses

The main analyses in this study focus on the accuracy of the 95 subjects in making eyewitness identifications. Table 14 presents the frequency, and percentage, of the subjects in each of the four experimental groups who made accurate, inaccurate, and Don't Know responses.

[50] Significant differences in group means among the excluded groups are not reported, as they are not the focus of the analysis.

Table 14

Correct, Incorrect, and Don't Know Responses Within Four Experimental Groups

	Group 1 LP/Training	Group 2 LA/Training	Group 3 LP/Control	Group 4 LA/Control
Correct	10 (38.5%)	4 (18.2%)	10 (38.5%)	1 (4.8%)
Don't Know	4 (15.4%)	7 (31.8%)	2 (7.7%)	3 (14.3%)
Incorrect	12 (46.2%)	11 (50%)	14 (53.8%)	17 (81%)
Totals (n = 95)	26	22	26	21

LP = Lineup Present, LA = Lineup Absent

An examination of the data in Table 14 reveals some apparent differences in response accuracies among the four experimental groups. Figure 4 represents the frequency of accurate, inaccurate, and Don't Know responses within each of the four experimental groups.

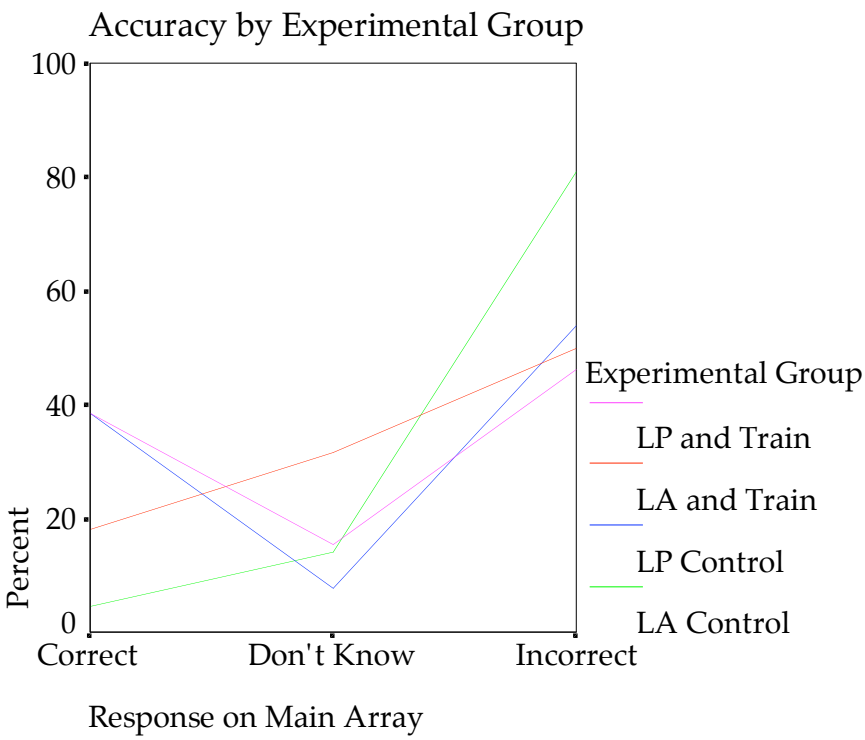

Figure 4: Response on Main Array.

LP = Lineup Present. LA = Lineup Absent.

Group 4 (Lineup Absent and Control), in particular, has a higher percentage of children who are inaccurate and a lower percentage of children who responded correctly. The interaction depicted above is based upon the experimental groups to which the children were assigned. Experimental Group (e.g., Group 1) was not entered into any analyses as a variable per se. Each experimental group is actually defined by two separate and distinct independent variables, lineup type (Lineup Present or Lineup Absent) and experimental condition (Training or Control), which may have different effects (main effects

and/or interaction) on response accuracy. Therefore, the independent variables of lineup type and experimental condition are used in analyses.

Types of Analyses

The majority of the data in this study are categorical. The majority of the analyses consist of loglinear and chi-square analyses. Loglinear analysis is an appropriate method for multivariate analyses of cagetorical data (Miller, Acton, Fullerton, & Maltby, 2002; Tabachnick, B. G. & Fidell, L. S., 2001; Bordens, K. S., & Abbott, B. B., 1991). Previous researchers have conducted loglinear analyses when analyzing relationships between similar independent and dependent variables (e.g., Ricci, Beal, & Dekle, 1996 (loglinear analysis with factors of interviewer; target presence/absence; and accuracy); Beal, Schmitt, & Dekle, 1995 (with lineup variations; target presence/absence; and accuracy as factors); Parker & Ryan, 1993 (separate loglinear analyses on types of correct responses and types of incorrect responses as factors in addition to factors of child/adult; gender; lineup presentation; and practice)).

Chi-square analyses and loglinear analyses have similar underlying data considerations. Siegel and Castellan (1988) cite the 1954 work of Cochran in setting forth that, when the degrees of freedom for the analysis are greater than one, expected cell frequencies must be at least one, with no more than 20% of the cells having expected frequencies less than five (p. 199). If there are expected cell frequencies less than one or if more than 20% of the cells have expected cell frequencies less than five, Siegel and Castellan recommend combining categories, where appropriate, so that the results of the analysis can be interpreted (1988, p. 199). Siegel and Castellan also note in regard to power that, as "[t]here is usually

no clear alternative to the chi-square test when it is used for categorical data, . . . the exact power of the chi-square test usually cannot be computed" (1988, p. 200).

Multiway frequency analyses and related analyses, including loglinear analyses, require that cell frequencies be adequate in size. According to Tabachnick and Fidell (2001), the expected cell frequencies for each two-way association must be the same as described above: all cells must have expected frequencies greater than one, with no more than 20% having expected cell frequencies less than five (see also, e.g., Howell, 1992, p. 591). Inadequate cell frequencies are not believed to lead to an increase in Type 1 error but do reduce power (Tabachnick & Fidell , 2001, p. 223). However, in some cases, low expected cell frequencies can increase Type 1 error with the Pearson chi-square statistic (Tabacahnick & Fidell, 2001, p. 223 & 251 (citing Milligan (1980) on p. 251)). Bordens and Abbott, based on Tabachnick and Fidell's recommendations, describe the need for "five times as many subjects as cells" (1991, p. 484).

This study was designed to have 120 subjects included in the main analyses, thereby allowing the examination of multiple factors within the same multiway analysis. As only 95 subjects can be included in any main analysis, the number of variables that can be examined within the same analysis are more limited than had been designed. Tabachnick and Fidell discuss the available options to address inadequate cell frequencies: accept reduced power, collapse across categories, or delete variables (2001, p. 223).

"The goal of a loglinear analysis usually is parsimony — to establish the simplest possible loglinear equation that manages to produce predicted frequencies for each cell that do not vary significantly from the actual cell frequencies" (Miller et al., 2002, p. 189). The evaluation of the model, therefore,

is described as being based upon "adequacy and parsimony" ([Loglinear information], 2004). Loglinear analysis begins with all two-way, or three-way, and "higher-way" interactions and proceeds to eliminate as many as possible "while still maintaining an adequate fit" between expected cell frequencies and observed cell frequencies (Tabachnick & Fidell, 2001, p. 219). In interpreting loglinear analyses, it is important to note that "tests of models look for statistical nonsignficance while tests of effects look for statistical significance (Tabachnick & Fidell, 2001, p. 251, emphasis in original). "In assessing goodness-of-fit for a model, you look for a nonsignificant G^2 [likelihood ratio chi-square] where the frequencies estimated from the model are similar to the observed frequencies" (Tabachnick & Fidell, 2001, p. 251).[51]

Table 15 presents the multiway frequency table for the factors of accuracy (3 levels: correct, Don't Know, incorrect), lineup type (2 levels: Lineup Present, Lineup Absent), and experimental condition (2 levels: Training and Control).

[51] Tabachnick and Fidell (2001) note that a less strict alpha criteria is needed, such as .10, because "retention of the null hypothesis is the desired outcome" (p. 251). Increasing the alpha level would prevent concluding that there are "too many "good" models" (Tabachnick & Fidell, 2001, p. 251). In this study, although the alpha level was considered to be .05, the models presented are also good models under a .10 alpha level.

Table 15

Multiway Frequency Table with Accuracy (3 levels), Lineup Type (2 levels) and Experimental Condition (2 levels)

Experimental Condition	Accuracy	Lineup Type LP	LA	Total
Training	Correct	10 7.6	4 6.4	14 14.0
	Don't Know	4 6.0	7 5.0	11 11.0
	Incorrect	12 12.5	11 10.5	23 23.0
Totals		26 26.0	22 22.0	48 48.0
Control	Correct	10 6.1	1 4.9	11 11.0
	Don't Know	2 2.8	3 2.2	5 5.0
	Incorrect	14 17.1	17 13.9	31 31.0
Totals		26 26.0	21 21.0	47 47.0

LP = Lineup Present. LA=Lineup Absent. Observed frequencies are in black. Expected frequencies are in red.

More than 20% of the cells have inadequate expected frequencies, as 3 cells (25%) have expected counts less than 5 (4.9, 2.8, 2.2). Although the overall sample is sufficiently large (n = 95) for an analysis with this many factors, relatively few children made Don't Know responses. Following Tabachnick and Fidell's recommendations in regard to low expected frequencies, this research utilizes the first two approaches in analyzing the relationship between accuracy, lineup type, and experimental condition. First, a loglinear analysis is conducted with the three factors of accuracy, lineup type, and experimental condition, with the recognition that power may be reduced. However, there is no other approach under which these interactions can be examined and the three levels of accuracy can be considered. A second loglinear analysis is then conducted with accuracy collapsed into two levels.

The factors of accuracy (correct, Don't Know, incorrect), lineup type (Lineup Present, Lineup Absent), and experimental condition (Training, Control) were examined by conducting a hierarchical loglinear analysis using SPSS Model Selection. Based upon the nature of this research, this analysis began with examination of all possible interactions, in a saturated model. The saturated model represents "all possible associations between all variables" (Miller et al., 2002, p. 191). "The full (saturated) model always provides a perfect fit to data so that expected frequencies exactly equal observed frequencies" (Tabachnick and Fidell, 2001, p. 234). As noted, "the purpose of modeling is to find the incomplete model with the fewest effects" that is still close to the observed frequencies (Tabachnick and Fidell, 2001, p. 234, emphasis in original). The analysis then progresses, with interactions, associations, and main effects being removed until the model that remains meets the goals of adequacy and

parsimony. The best model fits the observed frequencies and is "not significantly different from the next more complicated model" (Tabachnick and Fidell, 2001, p. 257). The results of the loglinear analysis are presented, as an example, in Appendix L.

The best model has one two-way association, accuracy and lineup type, with the likelihood ratio $\chi 2$ (6) = 5.70, p = .46. This represents a good fit between the model and the observed frequencies, with at least a 45.7% chance that any difference between observed frequencies and those predicted by the model is due to chance alone (see, e.g., Miller et al., 2002). This model reflects that lineup type has an effect on accuracy. Overall, children are more accurate in the Lineup Present condition. The graph in Figure 5 depicts the response accuracy of children in the Lineup Present and Lineup absent conditions. A chi-square analysis confirms the overall main effect of lineup type, $\chi 2$ (2) = 9.31, p = .01.

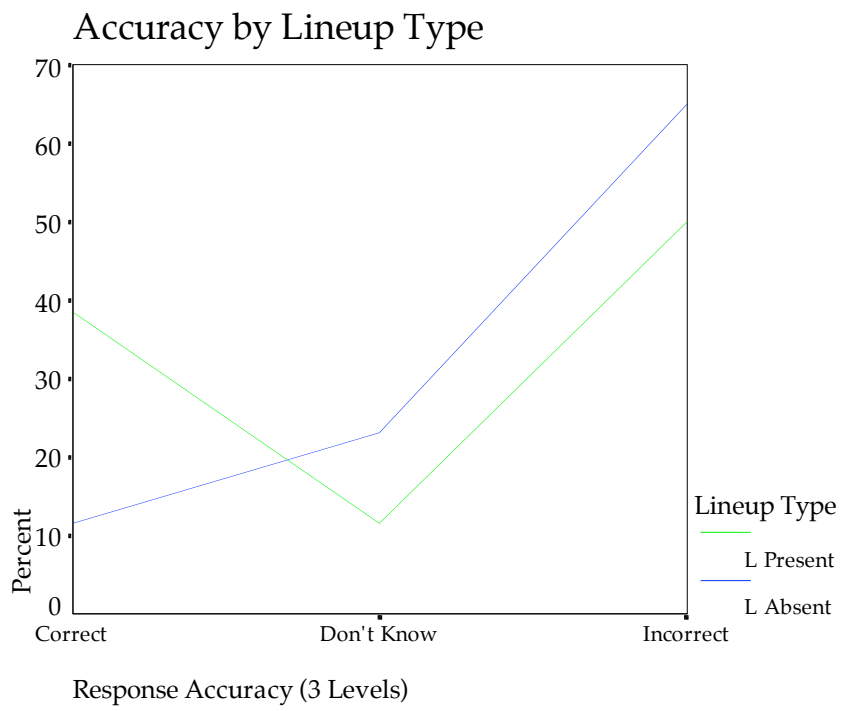

Figure 5: Response Accuracy (3 levels) by Lineup Type

The graph in Figure 6 depicts the response accuracy of children in the training and control conditions. There is no significant effect of experimental condition upon accuracy, $\chi 2\ (2) = 3.79$, $\underline{p} = .151$, ns.

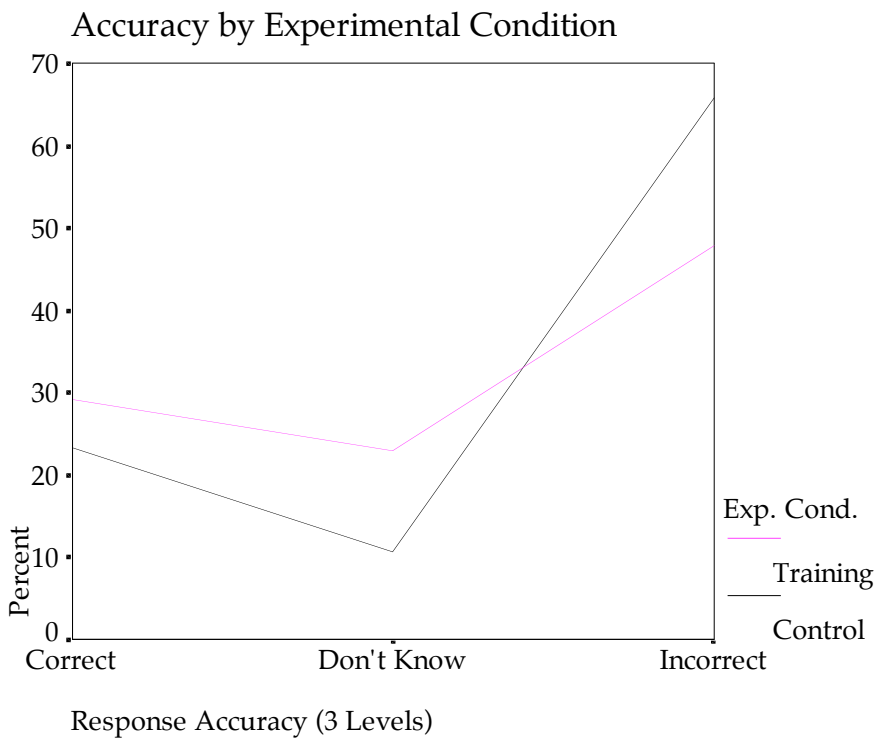

Figure 6: Response Accuracy (3 levels) by Experimental Condition

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As the potential interactions between lineup type, experimental condition, and accuracy were the focus of the loglinear analysis, Figure 7 represents the combination of Figure 5 and Figure 6. In interpreting this graph, it is important to note that each participant is in effect represented twice on this graph, once in lineup type and once in experimental condition.

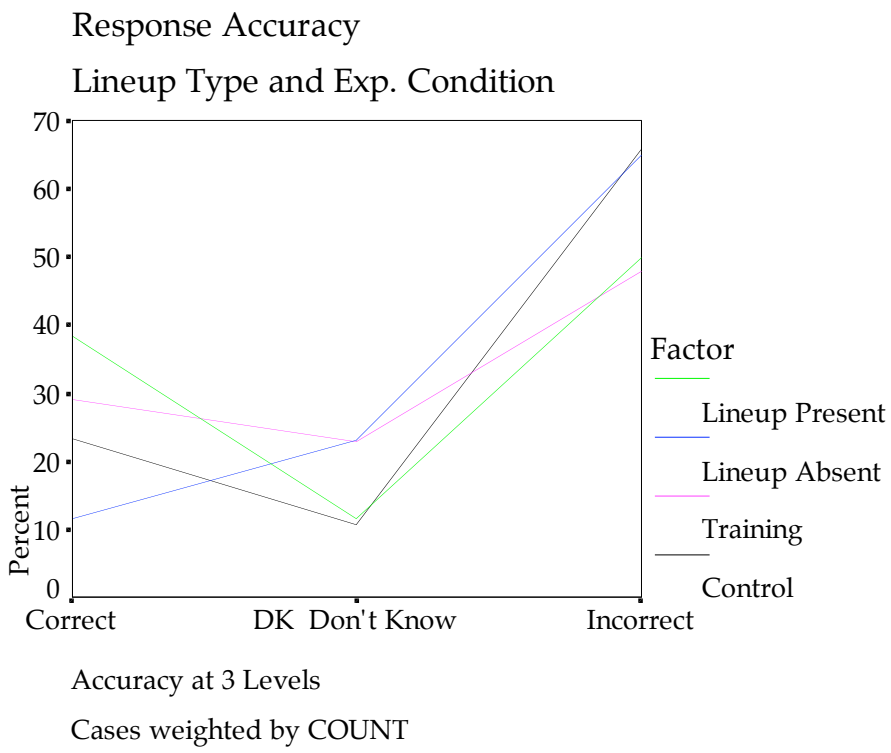

Figure 7: Combination of Figure 5 and Figure 6

Due to the number of cells with low frequencies, the accuracy variable was collapsed into two levels: correct and incorrect. This is consistent with other research, where Don't Know answers have been combined. In the Lineup Present condition, correct answers were a correct identification of the "suspect." Incorrect answers included false identification, false rejection, and Don't Know. In the Lineup Absent condition, correct answers included a correct rejection or Don't Know. Incorrect answers included false and foil identifications. The multiway frequency table is presented as Table 16.

Table 16: Multiway Frequency Table with Accuracy (2 levels), Lineup Type (2 levels), and Experimental Condition (2 levels)

Experimental Condition	Accuracy	Lineup Type LP	LA	Total
Training	Correct	10 11.4	11 9.6	21 21.0
	Incorrect	16 14.6	11 12.4	27 27.0
Totals		26 26.0	22 22.0	48 48.0
Control	Correct	10 7.7	4 6.3	14 14.0
	Incorrect	16 18.3	17 14.7	33 33.0
Totals		26 26.0	21 21.0	47 47.0

LP = Lineup Present. LA=Lineup Absent. Observed frequencies are in black. Expected frequencies are in red.

Cell frequencies were sufficient. The loglinear analysis with factors of accuracy (correct, incorrect), lineup type (Lineup Present, Lineup Absent), and experimental condition (Training, Control) revealed a significant main effect of accuracy: significantly more children made inaccurate responses, likelihood $\chi 2$ (6) = 5.68, $\underline{p}$ = .460. However, there was no interaction between lineup type and accuracy or between experimental condition and accuracy. Chi square analyses confirmed no significant differences in accuracy by lineup type, $\chi 2$ (1) = .129, $\underline{p}$ =

.719, ns, or experimental condition, $\chi 2$ (1) = 1.99, p = .158, ns. Figure 8 presents the graph of lineup type and accuracy (2 levels), Figure 9 presents the graph of experimental condition and accuracy (2 levels), and Figure 10 represents the combination of Figure 8 and Figure 9.

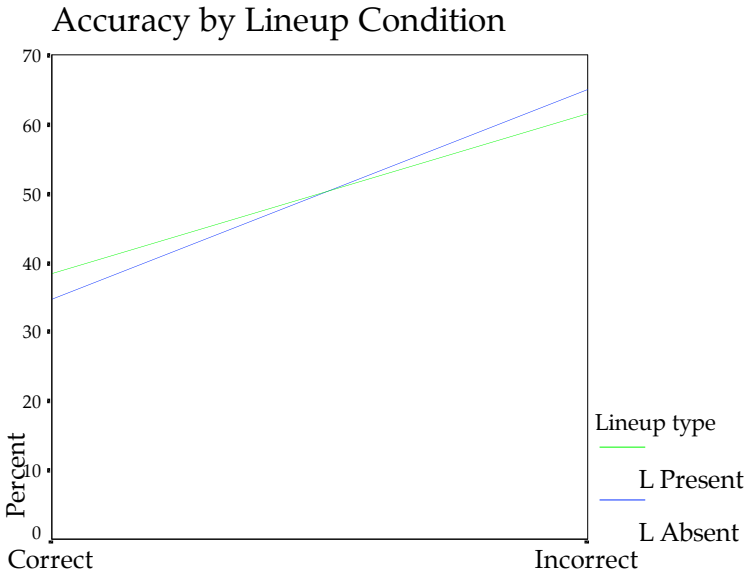

Figure 8: Response Accuracy (2 levels) by Lineup Type

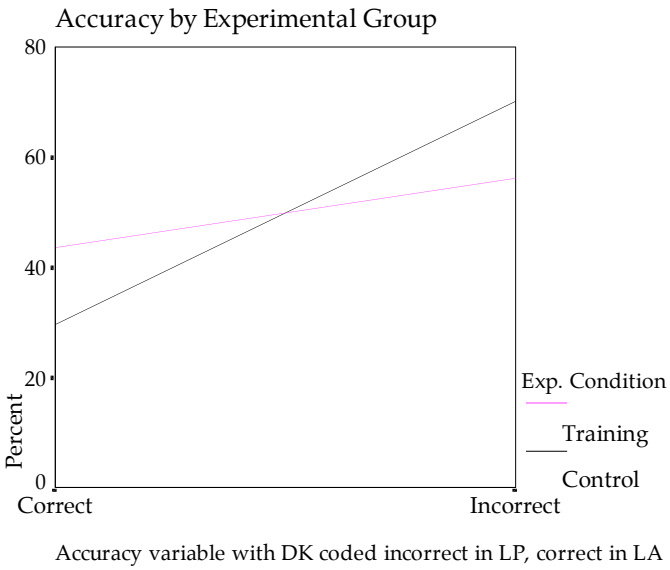

Figure 9: Response Accuracy (2 levels) by Experimental Condition

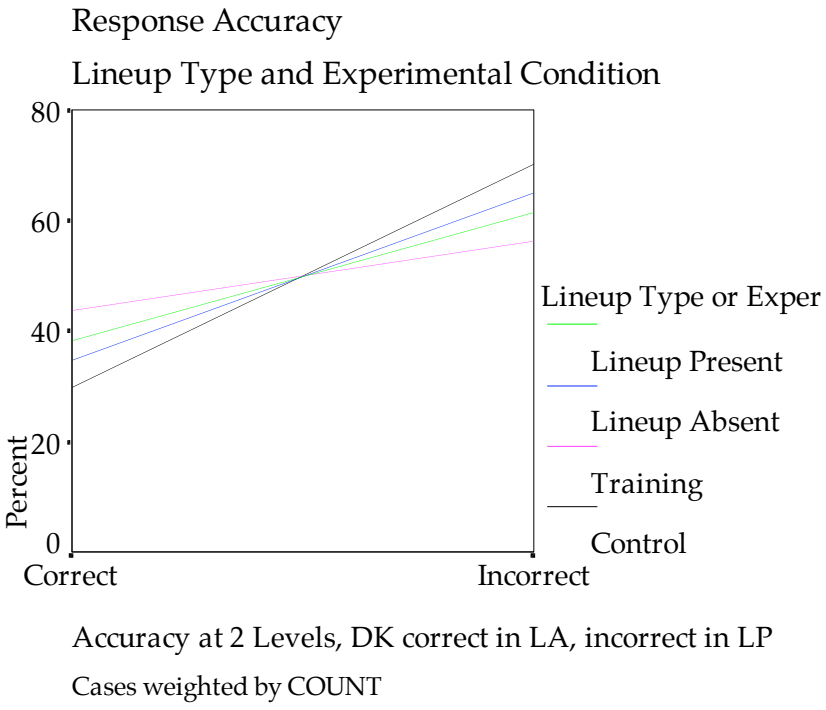

Figure 10: Combination of Figure 8 and Figure 9

Previous researchers, suggesting that different processes are at play for children in Lineup Present versus Lineup Absent conditions, have examined the Lineup present and Lineup Absent conditions separately (e.g., Pozzulo & Lindsay, 1999; Pozzulo & Lindsay, 1998; and Beal, Scmitt, & Dekle, 1995). Therefore, the effect of experimental condition (Training, Control) on accuracy was examined separately for subjects in the Lineup Present and Lineup Absent conditions.

Lineup Present

Of the 95 subjects in the main analyses, 52 participated in the Lineup Present condition. Of these 52 subjects, 20 subjects (38.5%) responded correctly by identifying Card 1. Six subjects (11.5%) indicated that they did not know and 26 subjects (50%) made an incorrect response. Of the 26 incorrect responses, 3 were false rejections (choosing Not Here, indicating that the person was not in the array). When accuracy is combined into 2 levels, 20 subjects (38.5%) in the lineup present condition were correct and 32 (61.5%) were incorrect. Table 17 presents response accuracy (at three levels and at two levels) in the lineup present condition. Figure 11 presents the frequency of the responses of the 52 subjects on the main array (accuracy at three levels) and Figure 12 presents response accuracy at two levels.

Table 17

Response Accuracy (3 levels and 2 levels) in Lineup Present

Accuracy at 3 Levels		Accuracy at 2 Levels	
	Number of Subjects		Number of Subjects
Correct	20 (38.5%)	Correct	20 (38.5%)
Don't Know	6 (11.5%)		
Incorrect	26 (50%)	Incorrect	32 (61.5%)

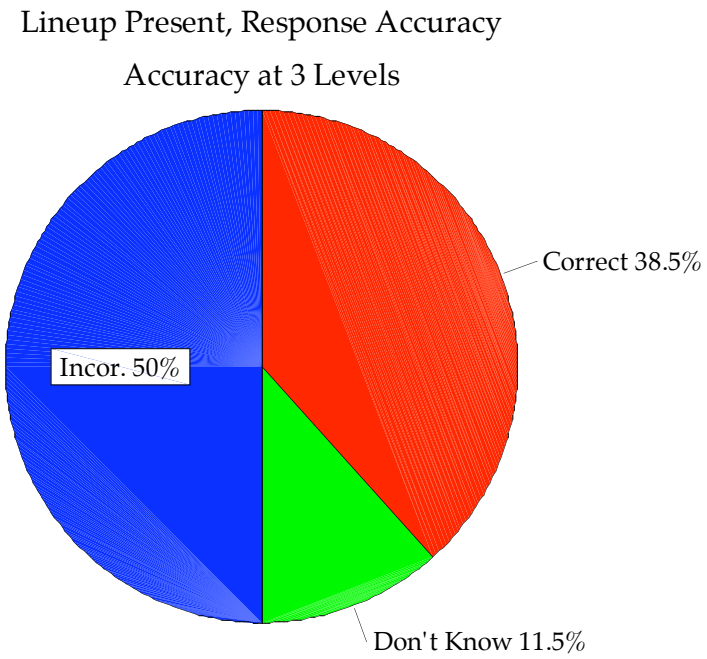

Figure 11: Response Accuracy (3 levels), Lineup Present

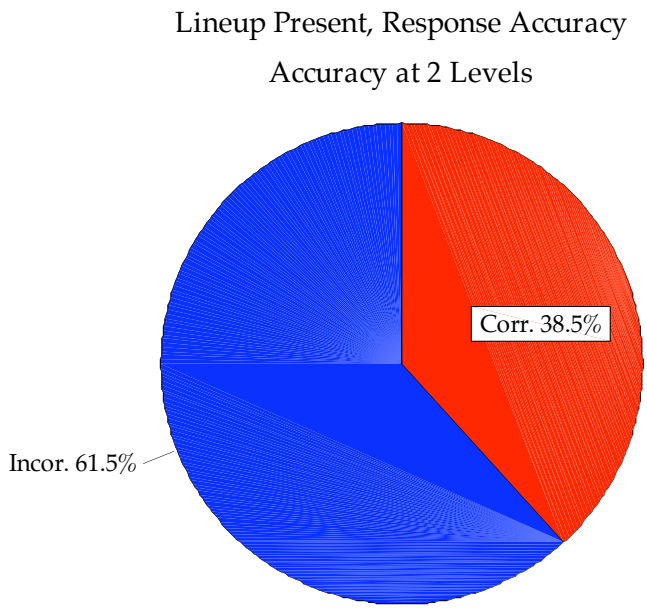

Figure 12: Response Accuracy (2 levels), Lineup Present

Table 18 presents response accuracy (at three levels and at two levels) for children who viewed a Lineup Present Array and were in the training condition (participated in training trials). Table 19 presents response accuracy (at three levels and at two levels) for children who were in the control condition (card sort task). In the Lineup Present condition, response accuracy (2 levels) did not vary significantly between the two experimental conditions (training and control). In fact, equal numbers of children were accurate in the training and control conditions. Figures 13-16 depict response frequencies (at three levels and at two levels) in the training and the control conditions for children who viewed the Lineup Present array.

Table 18

Response Accuracy (3 levels and 2 levels) in Lineup Present, Training

Accuracy at 3 Levels		Accuracy at 2 Levels	
	Number of Subjects		Number of Subjects
Correct	10 (38.5%)	Correct	10 (38.5%)
Don't Know	4 (15.4%)		
Incorrect	12 (46.2%)	Incorrect	16 (61.5%)

Table 19

Response Accuracy (3 levels and 2 levels) in Lineup Present, Control

Accuracy at 3 Levels		Accuracy at 2 Levels	
	Number of Subjects		Number of Subjects
Correct	10 (38.5%)	Correct	10 (38.5%)
Don't Know	2 (7.7%)		
Incorrect	14 (53.8%)	Incorrect	16 (61.5%)

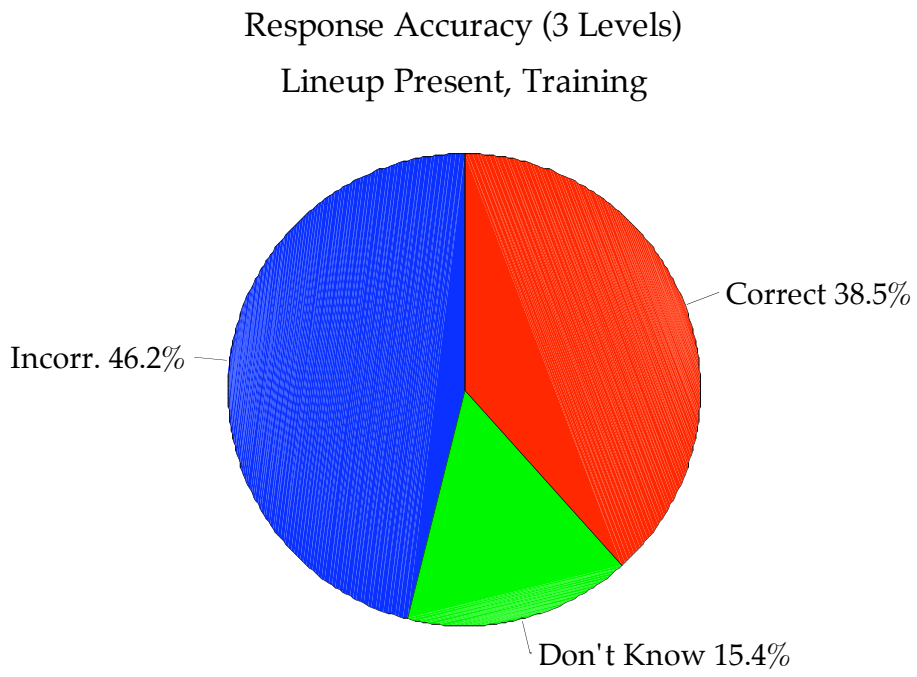

Figure 13: Response Accuracy (3 levels) Lineup Present, Training

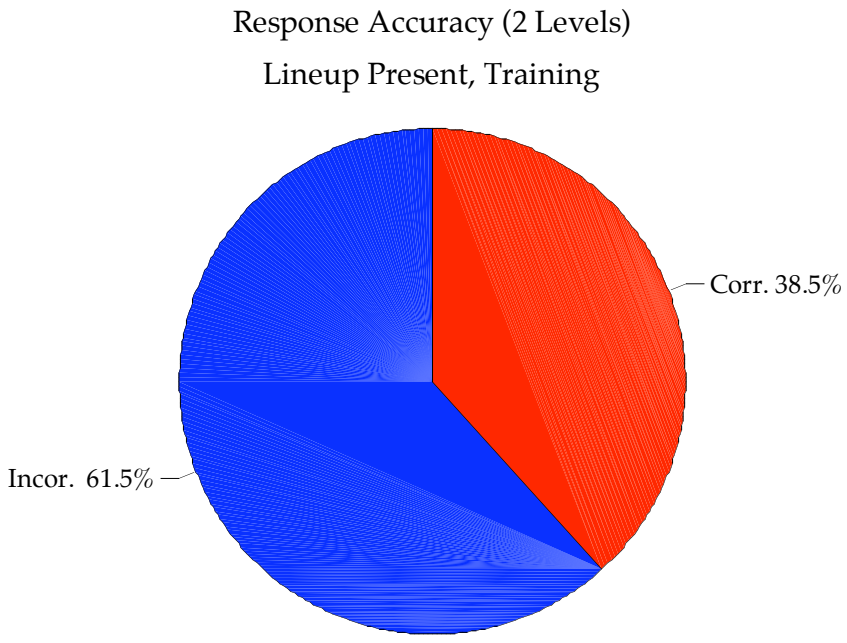

Figure 14: Response Accuracy (2 levels) Lineup Present, Training

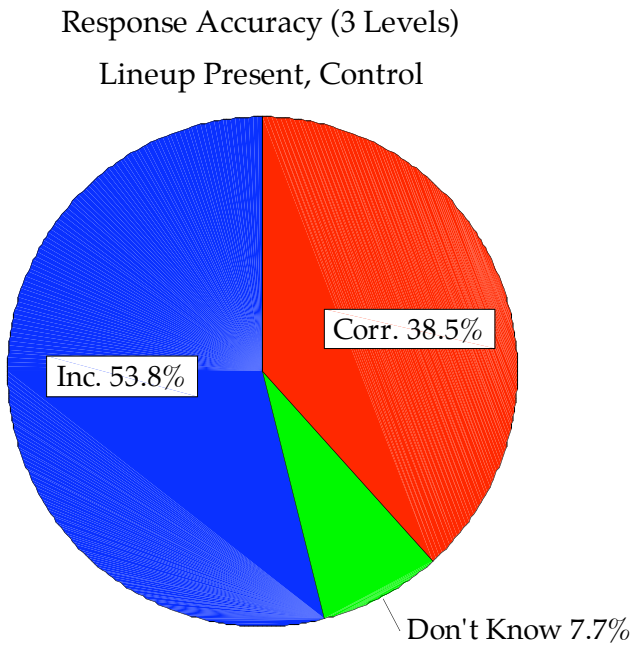

Figure 15: Response Accuracy (3 levels) Lineup Present, Control

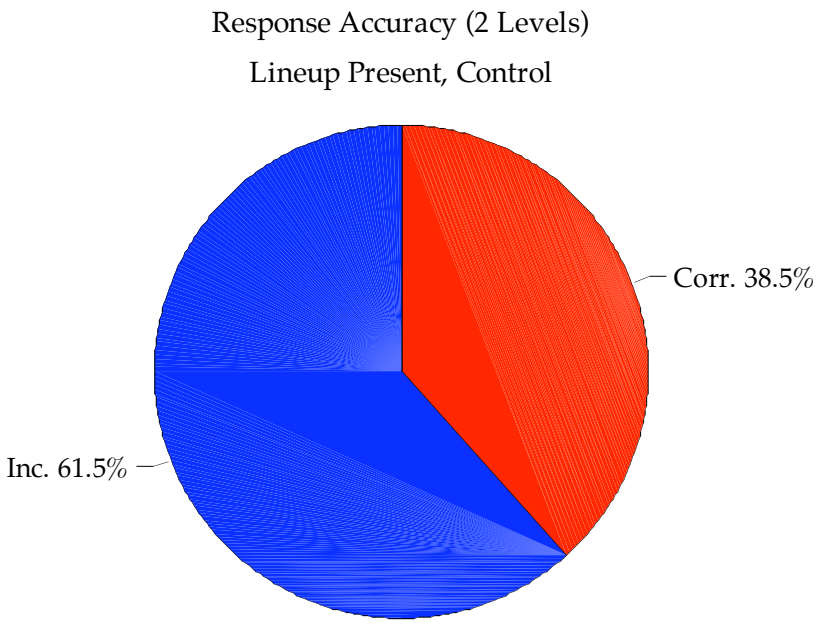

Figure 16: Response Accuracy (2 levels) Lineup Present, Control

Lineup Absent

The response accuracies of the 43 subjects who viewed Lineup Absent arrays were examined separately to investigate whether training had a significant effect on response accuracy within this group. Five children (11.6%) made correct responses (correct rejections), 10 children made Don't Know responses (23.3%), and 28 children (65.1%) made incorrect responses. When accuracy is combined into two levels, with Don't Know responses coded as correct responses, 15 children (34.9%) were correct and 28 (65.1%) were incorrect. Table 20 presents the response accuracy (at three levels and at two levels) in the Lineup Absent condition. Figures 17 and 18 depict response accuracies (at three levels and at two levels) in the Lineup Absent condition.

Table 20

Response Accuracy (3 levels and 2 levels) in Lineup Absent

Accuracy at 3 Levels		Accuracy at 2 Levels	
	Number of Subjects		Number of Subjects
Correct	5 (11.6%)	Correct	15 (34.9%)
Don't Know	10 (23.3%)		
Incorrect	28 (65.1%)	Incorrect	28 (65.1 %)

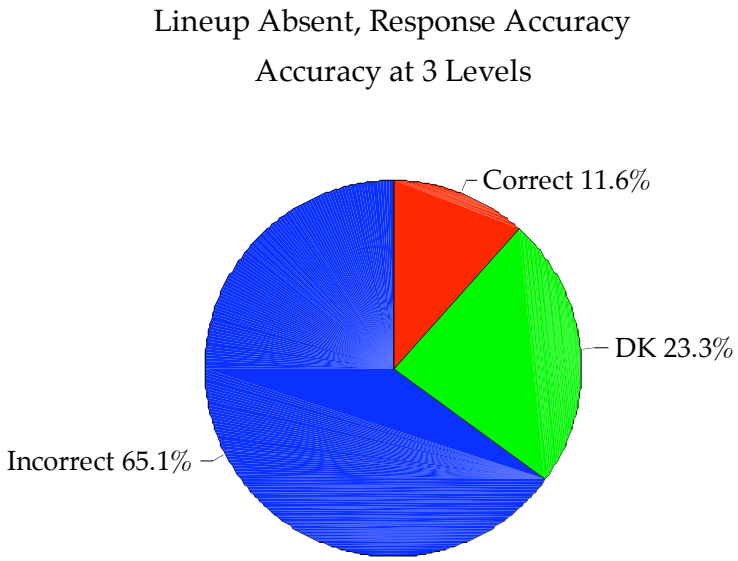

Figure 17: Response Accuracy (3 Levels), Lineup Absent

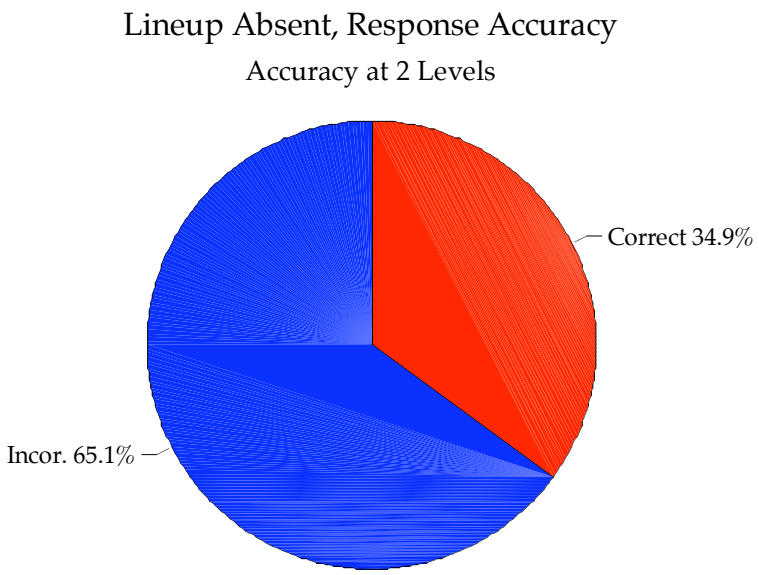

Figure 18: Response Accuracy (2 Levels), Lineup Absent

For the Lineup Absent conditions, Table 21 presents response accuracies (three levels and two levels) for children who received training (participated in training trials) and Table 22 presents response accuracies (three levels and two levels) for children who were in the Control condition (card sort).

Table 21

Response Accuracy (3 levels and 2 levels) in Lineup Absent, Training

Accuracy at 3 Levels		Accuracy at 2 Levels	
	Number of Subjects		Number of Subjects
Correct	4 (18.2%)	Correct	11 (50%)
Don't Know	7 (31.8%)		
Incorrect	11 (50%)	Incorrect	11 (50%)

Table 22

Response Accuracy (3 levels and 2 levels) in Lineup Absent, Control

Accuracy at 3 Levels		Accuracy at 2 Levels	
	Number of Subjects		Number of Subjects
Correct	1 (4.8%)	Correct	4 (19%)
Don't Know	3 (14.3%)		
Incorrect	17 (81%)	Incorrect	17 (81%)

In the Lineup Absent condition, experimental condition has a significant interaction with accuracy. In the Lineup Absent condition, children who received training made significantly more accurate responses, $\chi 2\ (1) = 4.53$, $p = .033$. Accurate responses consisted of correctly rejecting the lineup (Not Here) or

indicating Don't Know. Figures 19-22 represent response accuracies (at three levels and at two levels) in the Lineup Absent condition by experimental condition (Training or Control).

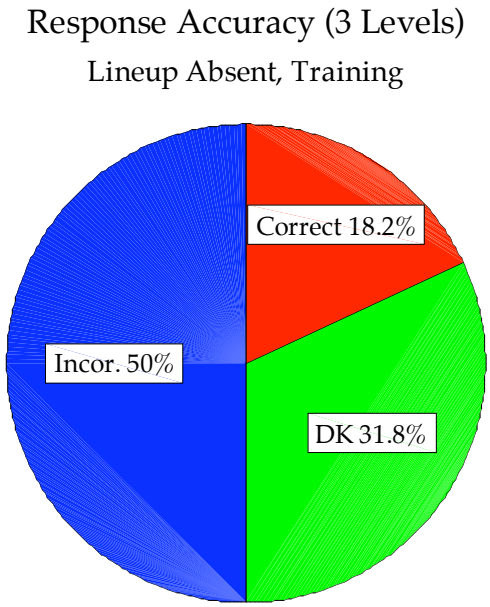

Figure 19: Response Accuracy (3 levels), Lineup Absent, Training

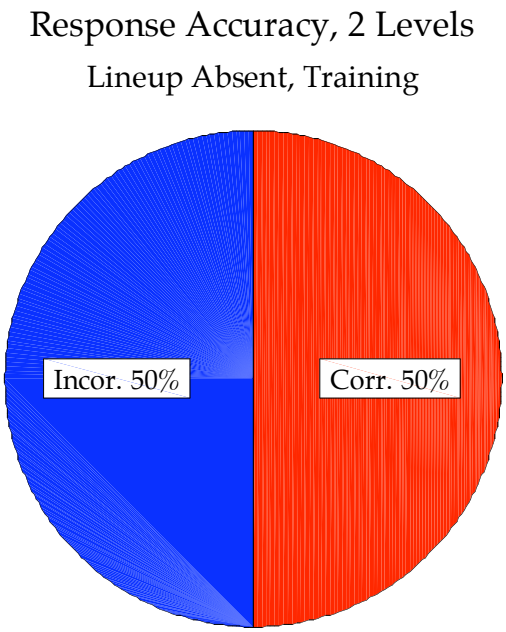

Figure 20: Response Accuracy (2 levels), Lineup Absent, Training

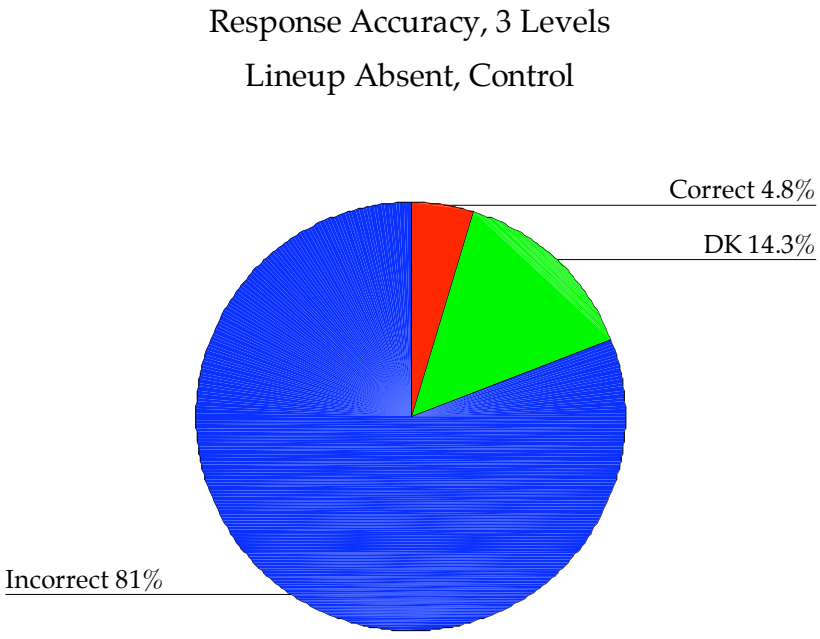

Figure 21: Response Accuracy (3 levels), Lineup Absent, Control

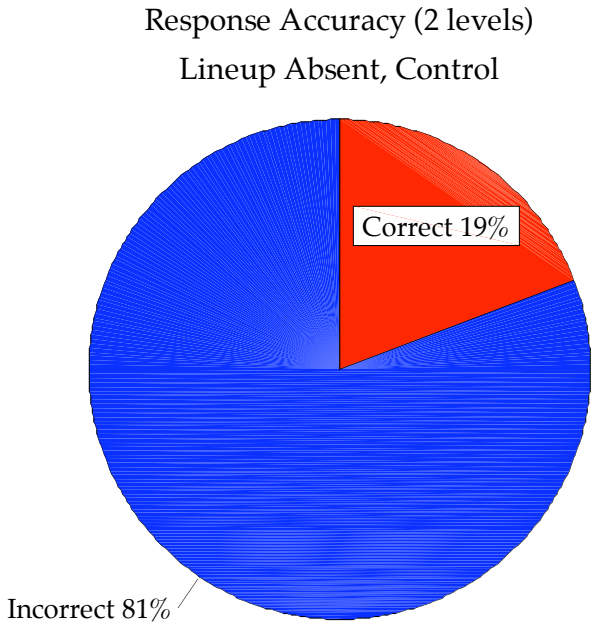

Figure 22: Response Accuracy (2 levels) for Lineup Absent, Control

Following the work of Lindsay, Pozzulo, Craig, Lee, and Corber (1997), the false identification rates were calculated for training condition and the control condition for the lineup absent arrays. As presented in Chapter 1, the false identification rate is calculated as the proportion of false positive identifications divided by the nominal size of the lineup (Lindsay et al., 1997). In the control condition, the proportion of false positive responses was .81. The estimated false identification rate is 13.5%.[52] In the training condition, the proportion of false responses was .50 and the estimated false identification rate was 8.3%.

Gender

Gender cannot be analyzed in a loglinear analysis with lineup type, experimental condition, and accuracy due to insufficient cell size. Therefore, lineup type was not included in the loglinear analysis, which was conducted with the factors of experimental condition, accuracy (2 levels), and gender. There was again a main effect of accuracy, reflecting the difference in the number of correct and incorrect responses, likelihood $\chi 2$ (6) = 8.51, $\underline{p}$ = .203. There was no main effect of gender and no interaction effect. Although there are more female than male participants, a one-way chi-square analysis confirmed that this difference was not significant, $\chi 2$ (1) = 3.8, $\underline{p}$ .051, n.s.

In order to be consistent in evaluating Lineup Present and Lineup Absent conditions separately, chi-square analyses for the factors of gender and accuracy were conducted within the Lineup Present group and within the Lineup Absent group. Gender had no significant effect on accuracy, $\chi 2$ (1) = 1.41, $\underline{p}$ = .235, n.s. (Lineup Absent) and $\chi 2$ (1) = .236, $\underline{p}$ = .627, n.s. (Lineup Present). Although there is no support for gender having an effect on accuracy, this conclusion does have to be viewed with some caution. As previously noted, there were only four male subjects in Experimental Group 4 (Lineup Absent and Control).

Age

Age, a continuous variable, was divided into categories in order to permit its inclusion in loglinear and chi-square analyses with other variables. For analyses, age was recategorized into two categorical variables. For one variable,

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[52] As discussed in Methods, although eight cards are in the lineup array, the nominal size is treated as six, representing the six photographs. The other two cards are graphic representations of the Don't Know and Not Here response options.

age was grouped into three categories (3 and 4-year-olds, 5 and 6-year-olds, and 7 and 8-yer olds) and for the other variable, age was grouped into two categories (3, 4, and 5-year olds and 6, 7, and 8-year-olds). There was no significant interaction between age (3 levels) and accuracy (2 levels), $\chi 2$ (2) = 1.46, $\underline{p}$ = .48, n.s.

In order to examine age without the restrictions of categorization into discrete levels, a one-way ANOVA was calculated with age as the dependent variable and accuracy (3 levels) as the independent variable. This "backward ANOVA" is essentially examining the same interaction as the chi-square analysis did, but without restricting age. The results were the same. There were no significant differences in age among the three levels of accuracy, F (2, 92) = .136, $\underline{p}$ = .873, n.s. The assumption of homogeneity of variance was met, Levene statistic (2, 92) = .137, $\underline{p}$ = .872, n.s.

Due to cell sizes, the most inclusive loglinear analysis that could include age was a loglinear analysis with factors of experimental condition (Training, Control), accuracy (2 levels), and age (2 levels). The best model had a main effect of accuracy, reflecting that more children were inaccurate, likelihood ratio $\chi 2$ (6) = 8.54, $\underline{p}$ = .20.

Age was then examined separately within the Lineup Present and Lineup Absent conditions. In the Lineup Present condition, there were no significant differences in accuracy based upon age, $\chi 2$ = .002, $\underline{p}$ = .964, n.s. Table 23 presents the multiway frequency analysis of age and accuracy in the Lineup Present condition.

Table 23

Multiway Frequency Table of Age (2 levels) and Accuracy (2 levels), Lineup Present

Accuracy	Age	
	3, 4, and 5-year olds	6, 7, and 8-year-olds
Correct	8 (38.1%)	12 (38.7%)
Incorrect	13 (61.9%)	19 (61.3%)
Totals:	21	31

In the Lineup Absent condition, there was a significant difference in accuracy based on age, $\chi 2$ (1) = 5.82, p = .016, n.s. Within the Lineup Absent condition, a t-test for independent samples was conducted with age as the dependent variable and accuracy (2 levels) as the independent variable. Again, this permitted the examination of the interaction without the restriction on age. In this analysis, there was no significant difference in age between correct responders and incorrect responders, t (41) = 1.54, p = .131, n.s. The assumption of homogeneity of variance was met, Levene's F = .346, p = .56, n.s. (mean age of correct responders = 6.06 years; mean age of incorrect responders = 6.74 years). The multiway frequency analysis of age and accuracy in the Lineup Absent condition is presented in Table 24. Experimental condition is also included in this table.

Table 24

Multiway Frequency Analysis of Age (2 levels), Accuracy (2 levels), and Experimental Condition (2 levels), Lineup Absent

Accuracy		Age	
		3, 4, and 5-year olds	6, 7, and 8-year-olds
Correct		10 (55.6%)	5 (20%)
	Training	8	3
	Control	2	2
Incorrect		8 (44.4%)	20 (80%)
	Training	4	7
	Control	4	13
	Totals:	18	25

Of the younger children, just over half were correct in the lineup absent condition. While 44% of the younger children were incorrect, 80% of the older children were incorrect, meaning they selected a photograph from the array (false positive identification). While cell sizes are not sufficient to permit the inclusion of experimental condition in the analysis, an examination of the experimental condition data is nevertheless revealing and suggests that age may also be interacting with experimental condition when children are viewing a lineup absent array. Of the 12 younger children who received training, 67% were correct. Of the 10 older children who received training, 30% were correct.

Comprehension Monitoring

Within the 95 children who are included in the main analyses, 94 completed the referential communication paradigm. Table 25 and Figure 26 present the frequencies of children who are successful monitors, poor monitors, and transitional.

Table 25: Comprehension Monitoring

Number of subjects	Classification on referential communication
52 (54.7%)	Successful monitors (speaker blamers)
27 (28.4%)	Poor monitors (listener blamers)
15 (15.8%)	Transitional

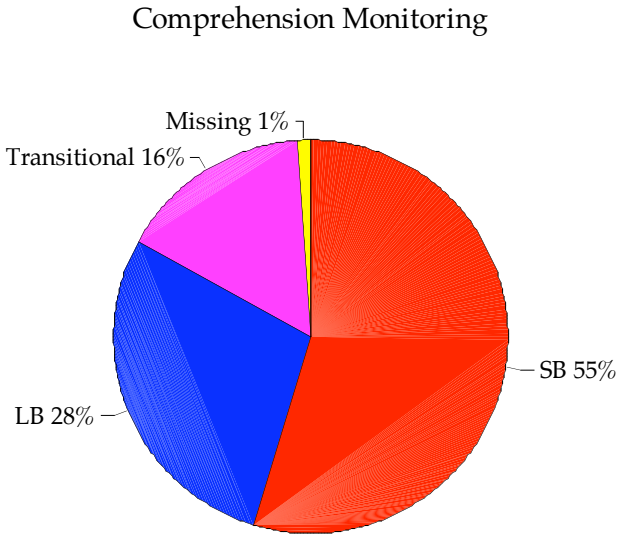

Figure 23: Comprehension Monitoring

SB = Speaker Blamer, LB = Listener Blamer

The 52 children who were successful monitors ranged in age from 3 years, 10 months to 8 years, 11 months, with an average age of 7.08 years (approximately 7 years, 10 months). Of these children, 13.5% were between the ages of 3 and 5 years; 86.5% were between the ages of 6 and 8 years. On the main array, 14 (26.9%) made correct responses, 12 (23.1%) made Don't Know responses, and 26 (50%) made incorrect responses.

Twenty-seven children were poor monitors (listener blamers). Of these children, 25 (92.6%) were between the ages of 3 and 5 years and 2 (7.4%) were between the ages of 6 and 8. The age range for poor monitors was 3 years, 8 months to 8 years, 5 months, with an average age of 4.98 years (approximately 5 years). On the main array, 9 (33.3%) made correct responses, 3 (11.1%) made Don't Know responses, and 15 (55.6%) made incorrect responses.

Fifteen children were classified as transitional. Seven of the transitional children (46.7%) were between the ages of 3 and 5 years. Eight (53.3%) were between the ages of 6 and 8 years. The age range of the transitional children was 4 years, 3 months to 8 years, 2 months, with an average age of 6.16 years (6 years, 2 months). Of these children, 1 (6.7%) made a correct response on the main array, 1 (6.7%) made a Don't Know response, and 13 (86.7%) made an incorrect response.

Age was significantly correlated with comprehension monitoring, Eta = .655.

Cell frequencies did not permit an examination of accuracy (3 levels) and comprehension monitoring (3 levels). With accuracy collapsed into two levels,

there was no significant difference in accuracy based on comprehension monitoring. A chi-square analysis of monitoring (3 levels) and accuracy (2 levels) revealed no significant interactions, $\chi 2$ (2) = 4.033, $\underline{p}$ = .133, ns. (A chi-square analysis with monitoring collapsed to two levels and accuracy at 2 levels (combining the poor monitors and the transitional monitors) remained non-significant, $\chi 2$ (1) = .895, $\underline{p}$ = .344, ns.

In order to examine possible interaction between comprehension monitoring, experimental condition (training, control) and accuracy, a loglinear analysis was conducted, with monitoring at two levels. No significant interactions or associations were found. There were differences in the numbers of accurate and inaccurate responders but no interaction, likelihood ratio $\chi 2$ (6) = 6.05, p = .417.

Comprehension monitoring was then examined within the Lineup Absent group. Factors of comprehension monitoring (2 levels), accuracy (2 levels), and experimental condition (2 levels) were entered into a loglinear analysis for the lineup absent group. Although 25% of the cells had expected frequencies less than 5, the analysis was conducted, with the possible loss of power, because it provided the only way to examine the potential interaction between experimental condition, comprehension monitoring, and accuracy. Neither interactions with, nor main effects of, comprehension monitoring were retained in the best model, under which there was a main effect of experimental condition (Training versus Control) on accuracy (as discussed previously), likelihood ratio $\chi 2$ (4) = 1.05, p = .90.

Response time

There were numerous methodological difficulties in accurately measuring response time (further detailed in Discussion). Given these difficulties, analyses concerning time are interpreted with caution, as the accuracy and reliability of the underlying data is questionable. Completion time information was available for 89 subjects. Completion times ranged from 0.80 seconds 67.82 seconds. A one-way analysis of variance was conducted to examine whether there were significant differences in response times among subjects who made correct identification responses, those who made incorrect responses, and those who made Don't Know responses. An ANOVA is not robust to violations of the homogeneity assumption when there are unequal sample sizes (see, e.g., Howell, Chapter 11, 1992, pp. 307-308). The sample sizes here are not equal (fewer subjects made don't know responses) and the assumption of homogeneity of variance was violated, Levene's statistic $(2, 86) = 13.50$, $p < .001$.
Because of this violation and the unequal sample sizes, the Welch statistic is used.[53] There was a significant difference in response times among the different response types, Welch's $F(2, 25.50) = 4.5$, $p = .021$. Table 26 presents the average response time for each type of response (correct, Don't Know, and incorrect).

[53] Howell, citing the work of other researchers, stated that "a procedure proposed by Welch (1951) has considerable advantage in terms of both power and protection against Type 1 errors, at least when sampling from normal populations" (Howell, 1992, p. 309).

Table 26: Response Time Means by Response Accuracy

	N	Mean	Standard Deviation
Correct	24	13.19	11.49
Don't Know	14	24.87	19.09
Incorrect	51	10.02	7.06
Total	89	13.21	12.00

Dunnet C post hoc analyses revealed that the significance is between response times for Don't Know and incorrect responses (mean difference = 14.85, significant at the .05 level). The subjects who made Don't Know responses took significantly longer to do so than subjects who made incorrect responses.

A t-test for independent samples was conducted to determine whether there are significant differences in response times between accurate responders and inaccurate responders when accuracy has been collapsed into two levels. Again, the assumption of homogeneity of variance is violated, Levene's $F = 8.096$, $p = .006$. The t-test for unequal variances revealed no significant difference in the response times of accurate and inaccurate responders (when accuracy is collapsed to 2 levels), $t(43.008) = 1.803$, $p = .078$.

Although, as addressed above, these results must be interpreted with caution, children who make don't know responses appear to take significantly longer to do so than children who make incorrect responses. When accuracy is collapsed, no significant differences in response times between accurate and inaccurate responses were detected.

Don't Know and Not Here Responses

One of the focuses of this research was to examine whether children's use of the Don't Know response option could be encouraged. Sixteen children made Don't Know responses. Of these children, 11 (68.8%) received training while 5 (31.3%) were in the control group (depicted in Figure 24). Twelve (75%) of the children were successful comprehension monitors (depicted in Figure 25).

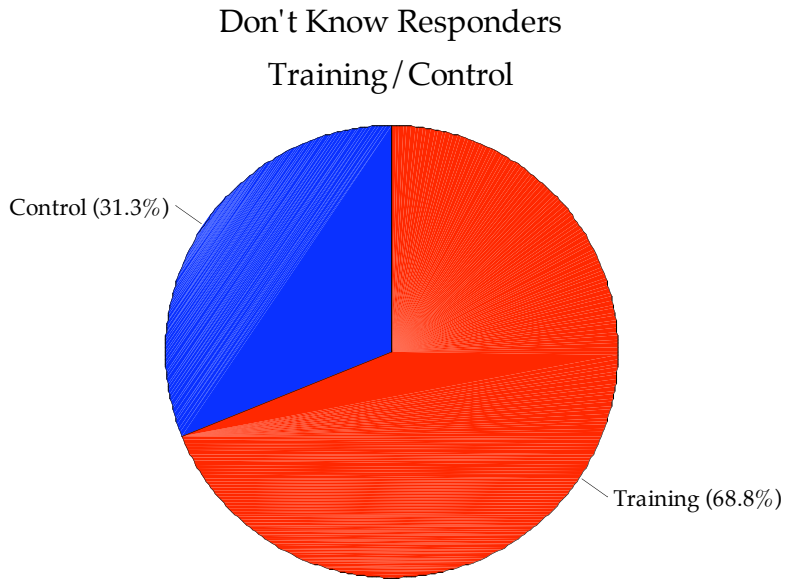

Figure 24: Don't Know Responders and Experimental Condition

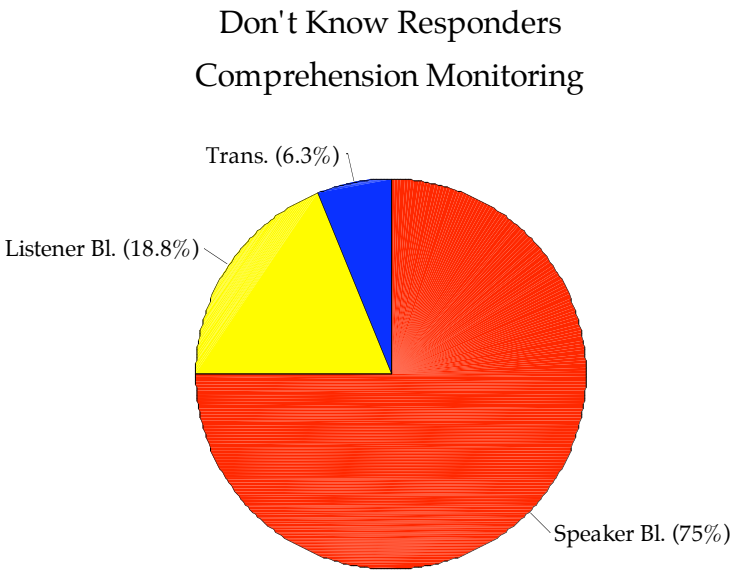

Figure 25: Don't Know Responders and Comprehension Monitoring

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It is also interesting to compare the Don't Know responders with the eight children who, correctly (5) or incorrectly (3), rejected a lineup array. While the children who rejected array were evenly divided in terms of comprehension monitoring, 6 (75%) of the children who rejected a lineup array had received training (depicted in Figure 26).

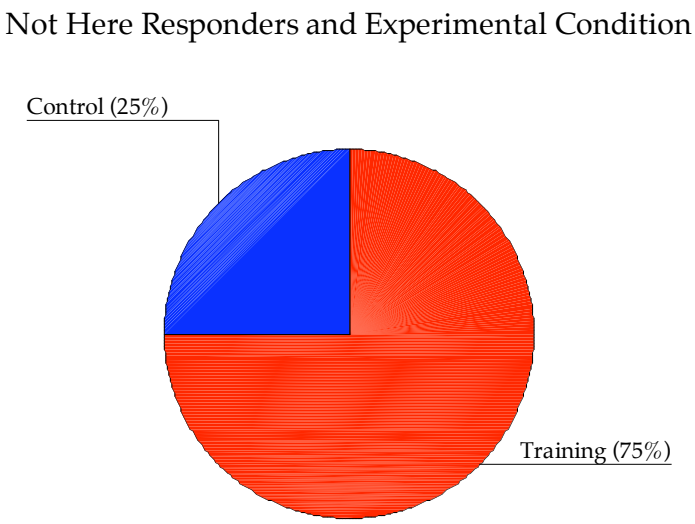

Figure 26: Not Here Responders and Experimental Condition

The classification of Don't Know responses into correct in Lineup Absent and incorrect for Lineup Present follows the trend in research in this field (e.g., Ricci, Beal, & Dekle, 1996). It also follows the logic of the lineup situation: if a witness says "don't know" and the target is in the lineup, then the target has not been identified and that is an error. A Don't Know response does not increase the rate of correct responses. However, it is also a different response than an incorrect rejection. In an incorrect rejection, the witness has, in essence, ruled out the suspect. By saying "I don't know," a witness is neither ruling anyone in nor excluding anyone. It is, in effect, a null response. A Don't Know response imparts the same information in Lineup Present and Lineup Absent conditions: the witness is not able to make a determination. In a real-life situation, where the police or other officials do not know whether the lineup array is Lineup Present or Lineup Absent, a null response is a null response.

One option, then, for perhaps more accurately reflecting Don't Know responses is to use the diagnosticity index (see Lindsay, Lea, & Fulford, 1991). However, it is unclear whether Don't Know responses would merely be excluded from this calculation or treated as rejections. Another alternative would be to code Don't Know responses as accurate in both Lineup Absent and Lineup Present conditions. Using Don't Know in Lineup Absent conditions is really no more of a rejection of a lineup than doing so in Lineup Present conditions. This should not be done without also separately evaluating the responses and the types of errors. However, when one of the main concerns is reducing false identifications, Don't Know responses would seem to be more correct than incorrect. Table 27 presents the response frequencies when Don't Know was reclassified as correct in both Lineup Present and Lineup Absent conditions.

Table 27

Response Accuracy with Don't Know Reclassified as Correct in Lineup Present and Lineup Absent

	Lineup Present			Lineup Absent			Totals
	Tr.	Con.	(Total)	Tr.	Con.	(Total)	
Correct	12	14	(26)	11	4	(15)	41
Incorrect	14	12	(26)	11	17	(28)	54

Tr. = Training, Con. = Control

There is no longer a significant difference in the number of accurate and inaccurate responders, $\chi 2\ (1) = 1.779$, $\underline{p} = 182$, n.s.

Narrative Response

The 95 children who have been included in the main analysis correctly identified the necessary contents from the video. It is important to note, however, that only two children did so without the use of any prompts: their answer included that an adult female took a camera that was not hers from a picnic. The prompts that were used for the video components were nonleading (see Appendix F, Data Record Sheets, for examples). The focus of this research is not on children's narrative reports. However, it is important to note that children who initially provide limited verbal reporting of a situation may in fact be able to provide additional accurate information, both in narrative description and in eyewitness identification.

It is also important to note that 18 children were coded as having made multiple responses to the main lineup array (only one final response was coded as their choice). If the child had made multiple positive responses, the experimenter reviewed the child's choices and asked him or her what was the best choice. Some children verbally rejected other photographs ("not her") and then selected their answer. In some cases, as described earlier, if the child verbally or nonverbally made an indication of uncertainty, the experimenter asked a follow-up question. Some children made an initial choice and then spontaneously changed their selection. Of these 18 children, the final response for 4 (22%) was accurate. Six (33%) made a Don't Know response while 8 (44%) made an inaccurate response. Other researchers have noted that children may make multiple responses to a simultaneous lineup (e.g., Lindsay et al., 1997). It

would seem important, when focusing upon multiple responses, to distinguish between behaviors that seem to be more in response to external stimuli, those that reflect guessing, and those that suggest that the responder has reassessed their initial (possibly impulsive) answer.

Comparisons with Other Research

Appendix K presents a chart comparing the results of the current study with results from other researchers. Overall, the results of this study closely mirror the results found by Parker and Ryan (1993). The video and main lineup arrays used in this study were developed from those used in studies by Beal et al. (1995) and Dekle et al (1996). In the original study by Dekle and colleagues, adults in the Lineup Present condition had a correct identification rate of 30% and children had a correct identification rate of 61%. Beal et al (1995), using the same stimulus materials and lineup arrays (with the addition of a nonverbal response cards), found correct identification rates for child witnesses ranging from 45% to 56% in the Lineup Present condition. The most direct comparison in regard to lineup presentation methods can be found in comparing the current study to Beal's modified lineup, where children had a 50% correct identification rate in the Lineup Present condition. Of the children in the current study, 39% made a correct identification in the Lineup Present condition. This is slightly lower than that found in the previous studies by Beal and Dekle. However, it is within the range generally found with other studies. In their meta-analysis, Pozzulo and Lindsay reported correct identification rates ranging from .17 to .90 (1998, Table 1).

In the Lineup Absent condition, 5% of the children in the Control condition of this study correctly rejected the lineup and 14% made a Don't Know

response, for a total correct rejection rate of 19%. In the three comparison studies by Dekle (1996) and Beal (1995), correct rejection rates ranged from 6% to 50%. In Dekle's study, adults had a correct rejection rate of 41%. Children in the current study who were in the training condition had a correct rejection rate of 50%. Pozzulo and Lindsay (1998) found the "proportion of correct rejections" for child witnesses to range from .08 to .87 (1998, Table 2).

Review of Hypotheses

The first hypothesis, that the type of lineup (Lineup Present, Lineup Absent) would have a significant effect on accuracy, was supported only when response accuracy was analyzed at 3 levels (correct, incorrect, and Don't Know). When accuracy was examined at three levels, lineup type had a significant effect on accuracy. It was hypothesized that more children would make errors in the Lineup Absent condition. A greater percentage of children did make incorrect responses in the Lineup Absent condition (65%) than in the Lineup Present condition (50%). A greater percentage of children made Don't Know responses in the Lineup Absent condition (23%) than did so in the Lineup Present condition (12%). However, the differences in responses are most striking when examining differences in correct responses. A greater percentage of children made correct responses in the Lineup Present condition (39%) than in the Lineup Absent condition (12%). The type of lineup no longer had a significant effect on accuracy when accuracy was collapsed into two levels (there was no significant effect when Don't Know responses were recoded as correct in Lineup Absent and incorrect in Lineup Present or when Don't Know responses were recoded as correct across both conditions). When Don't Know responses were coded as correct in Lineup Absent and incorrect in Lineup Present (as is traditionally

done), significantly more children made incorrect responses than correct responses overall. When Don't Know responses were reclassified as correct in all conditions, there was no significant difference in the number of accurate and inaccurate responders.

The second hypothesis was that age would have a significant impact on accuracy, with possible interaction effects with other factors. It was hypothesized that older children would be more accurate than younger children, particularly in the Lineup Absent condition. This hypothesis was partially supported, but in the opposite direction from what was expected. Age had no significant overall effect on accuracy. Within the Lineup Present condition, there was no significant effect of age on response accuracy. However, within the Lineup Absent condition, there was a significant interaction between accuracy and age, examined as a 2-level categorical variable (ages 3-5 years and ages 6-8 years), with a greater percentage of the younger children making correct responses than the older children. However, it is important to note that the difference in the mean ages of these two groups was not significant (t-test with age as the dependent variable).

The third hypothesis was that children who were in the Lineup Absent group and received training would make fewer errors than those who were in the Lineup Absent group but did not receive training. This hypothesis is supported. In the Lineup Absent condition, training significantly interacted with response accuracy. The proportion of correct responses was significantly higher for children in the Training group as compared to those in the Control group. In the Lineup Absent condition, a greater percentage of children made Don't Know responses in the Training group than did so in the Control group. Overall, the

children who received training made more correct responses, more Don't Know responses, and fewer false identifications. For the Lineup Present condition, it was hypothesized that training would increase or have no effect on response accuracy. There was no significant effect of training on response accuracy in the Lineup Present condition; in fact, the percentage of correct responders and the percentage of incorrect responders was the same within the Training and the Control groups.

The fourth hypothesis was that age and level of comprehension monitoring would interact with experimental condition (Training, Control) and that younger children might not be able to improve their response accuracy. Limited cell sizes prohibited complete examination of the possible interactions. No significant associations or interactions with comprehension monitoring were found. As discussed above, there were no differences in the Lineup Present condition in accuracy between the two age groups (3-5 years, 6-8 years). There was, however, a significant interaction between response accuracy and age in the Lineup Absent condition. A review of the frequencies suggests a possible interaction with training.

The fifth hypothesis, that there would be no significant difference in the response times of children making correct, incorrect, and Don't Know responses, was not supported. While the response time data must be viewed with great caution, Don't Know responders had significantly longer response times than incorrect responders.

Chapter 5: Discussion

The findings from this research have implications for police and others who play a role in investigations in which child witnesses are involved. They also have implications for researchers examining system variables that affect the accuracy of children's eyewitness identifications.

The results of this study lend support to the theory that different decision-making processes are at play when children make decisions in Lineup Present versus Lineup Absent conditions. Among the children who viewed the Lineup Present array, 39% accurately identified the "perpetrator." Sixty-one percent of the children made a false identification or indicated Don't Know. As discussed, errors in the Lineup Present condition present somewhat less of a risk, as presumably they are known errors. This correct response rate falls within the range found by previous researchers using the same stimulus material (slide show) and lineup arrays when both child witnesses and adult witnesses are included (see Appendix M; see Beal et al., 1995; Dekle et al., 1996). As presented in Chapter 1, previous researchers have often found that lineup type (Present, Absent) has an impact upon response accuracy. In this study, when Don't Know responses were recoded, lineup condition no longer had an effect.

It seems likely that some methodological factors impacted the performance of the child witnesses in this study. The quality of the stimulus materials had deteriorated since the original. The women in the lineup array itself appear very similar. The combination of these two factors alone creates a very challenging task for an eyewitness. However, children who responded "I don't know" were coded, as in other research, as incorrect. A Don't Know response, however, may accurately reflect the witness' knowledge in regard to

this task. When Don't Know is considered a correct response, 50% of the children in the Lineup Present condition responded correctly.

In the Lineup Absent condition, 65% of the children incorrectly identified a person from the array. While this is an over-estimation of the true rate of false identification, as presumably only one of the six photographs would in fact be an unknown error, it is nevertheless concerning. Eleven percent of the children correctly rejected the array. Only one child (5%) in the Control group correctly rejected the array.

Training had a significant effect on accuracy within the Lineup Absent array. In the Control group, 81% of the children incorrectly identified a person from the array while only 50% did so in the Training group. While the 50% false identification rate remains a concern, it is an improvement over an 81% false identification rate.

Training did not have a significant interaction with response accuracy in the Lineup Present condition. Response accuracy did not improve. However, it also did not decrease. In some ways, the witnesses may have been at the performance ceiling, based on the stimulus material and the lineup array. Practice and training were not of assistance in increasing their ability to identify the target when the target was in the array. It is possible that training could impact the rate of utilizing the Don't Know response (15% of the children in the Training condition made Don't Know responses while 8% did so in the Control condition), but limited cell sizes prohibit any conclusions as to the effect of training on utilization of Don't Know responses.

Of the children who participated in the training trials, 92% passed Training Trial 1, when the children had two chances to respond to the array and the target picture remained visible. Thirty-six percent of the children passed Training Trial 2, when they had only one chance to respond and the target

picture was removed. The training protocols and procedures were developed for this study, with the goal of familiarizing children with the three possible response options and appropriate use of each. One factor that may contribute to the relatively low number of children passing Training Trial 2 was that Don't Know was coded as incorrect except in the Don't Know arrays, for methodological purposes. However, in future research, it is recommended that Don't Know be coded in the training trials as it is for the main arrays. It is also recommended that the practice and training from this study be combined with training that focuses on the process and the decision-steps by which the children are using the response options. Procedures similar to the elimination lineups being used by Pozzulo and Lindsay (1999) could be incorporated into training procedures. As an example, children could practice first identifying the picture that looks most like the target and then using the absolute judgment process (e.g., Pozzulo and Lindsay (1999) of determining whether to select that picture, reject the lineup, or ask for help or indicate uncertainty.

For the four children who failed Training Trial 1, it seems a fair conclusion that they did not attend to or understand the task demands or their response options. If, as is recommended, practice and training with lineup arrays are implemented for young eyewitnesses, more research into the training procedures will be needed, as will a valid method of assessing the mastery of the task. It is premature to recommend whether a "screening" measurement, based upon mastery of the task and not on organismic characteristics (such as age) would be meaningful and, certainly, even if it were, implementation would have serious legal implications that would need consideration. However, it is concerning if any witness attempts to respond to a task that it appeares they did not understand.

One of the goals of this study was to increase the number of children who made Don't Know responses. As the number of children who made Don't Know responses was relatively small, there were significant constraints on any analyses. However, more children made Don't Know responses in this study than has been reported by other researchers. It is possible that even more children could be viewed as making this response if the "I guess it is her" were further explored. The examination of the Don't Know responders revealed some interesting trends. The majority had received training and were successful comprehension monitors. This is suggestive that explicit recognition of a Don't Know option and practice in using it may be important factors in increasing the appropriate utilization of this response option. It also hints at a developmental component that may be a factor in children's ability to recognize and to appropriately acknowledge uncertainty. Similarly, the majority of children who rejected a lineup array (correctly or incorrectly) had participated in training.

Although no significant results were found in analyses involving comprehension monitoring, the limited number of subjects precluded an analysis of some interactions. As discussed, some of the data are suggestive that there may be a relationship between comprehension monitoring (or related developmental measures focusing on children's ability to recognize and appropriately respond to uncertainty) and use of the Don't Know response option. The use of such assessment measures in research is recommended in order to gain increased understanding of the processes of children's decision-making abilities and of methods by which researchers can assist them to apply their abilities within eyewitness identification tasks.

Several factors seem likely to be influencing the findings in regard to age. There were significant differences in age between the subjects who were included in the main analyses and those who were excluded. The children who

failed to identify the video components and the children who discontinued were significantly younger than those included in the main analyses. These children were excluded based upon methodology and not as a result of their age. Presumably, a potential witness who does not provide any indication that he or she observed the event in question is unlikely to be asked to make an identification. It is reasonable to expect that younger children would be more likely to want to discontinue and to have difficulty recalling and/or expressing the video contents. However, the fact that some of the younger children were excluded must be taken into consideration in interpreting the results. The younger children who were included in the main analyses may have been those who had already developed certain competencies and skills.

There was also no significant difference in response accuracy among the age groups in the Lineup Present condition. The significant interaction between age and accuracy in the Lineup Absent condition was in the opposite direction than expected. The proportion of correct responses was significantly higher for younger children (3 -5 years) than for older children (6 -8 years). An examination of the data suggests a likely interaction with experimental condition. This result is viewed with some caution, as in the parametric (t-test) analysis, there was no significant difference between the mean ages of the correct and incorrect responders. However, younger children may be less influenced by demand characteristics regarding Don't Know or Not Here responses. There are many aspects of their world that are new to them and about which they ask questions and express that they don't know the answer. Their memory processes, and the processes by which they make their judgments, may be different.

Limitations

The results of this study must, as in any research, be considered in light of confounding and limiting factors. Many of the factors that could be controlled

were in fact appropriately controlled through randomization. Random assignment was successful at creating four experimental groups with approximately equal numbers of subjects in each. There were no significant differences among the four experimental groups on the basis of age or gender. There were, however, some significant limitations, including the number of subjects, over-reliance on this author as the interviewer, methodological limitations, and the categorical nature of the data.

The total number of participating subjects was less than designed, which made some analyses impossible and limited the power of some analyses due to low sample sizes. The number of enrolled subjects was insufficient to absorb the reduction in frequencies that resulted from the exclusion of subjects from main data analyses. In part, the number of subjects was limited by selection bias. In this study, there are several "layers" to selection bias. Not only did the children agree to participate, but the schools, the teachers, and the parents all had to consent to participation. Time was another limiting factor, in that subject recruitment could not go on indefinitely. In addition, the disruptions (such as the hurricane that severely impacted the area and its aftermath) that affected the schools, and communities, in which this project was being conducted may also have affected response rate.

This author served as the primary interviewer, as the number and availability of additional data collectors being more limited than planned. In addition to collecting the vast majority of the data, this author randomly assigned all children, ensured completeness of research forms, coded, entered, and analyzed the data. Data analysis had begun prior to final completion of data collection. One resultant limitation relates to the author's remaining blind to the child's experimental condition assignment. In the vast majority of cases, the author was in fact blind to the experimental group to which a child was assigned.

However, there were rare occasions when random assignment took place immediately prior to meeting with a child (for example, when a consent form was returned and a child was seen on the same day) and therefore the author was not truly blind to random assignment. A more overarching limitation is that it is possible for the author's bias to have affected results. Although the design of the protocol limits the potential for results to have been influenced, the author was inevitably aware of the trends in the research and the outcomes of interest. It is possible that bias affected the interaction with a child, such as the type or amount of prompts or questions used, or the coding of data on variables where judgment factored into the decision. Although this author believes that potential bias was reduced by the methodology and by careful review of data for consistency, the potential does remain.

There were some limitations within the materials and the methodology. In regard to the video stimulus, at least two slides seem to have been missing from the original set of 30 when they were acquired by this author (28 slides were acquired and 1 of the 28 may not have been used in the original slide show). Based upon records, one of the missing slides would have included the perpetrator. In addition, the quality of the images has degraded over time in color and clarity. One unanticipated confound also was evidenced by several children commenting that the woman who took the camera looked like this author. At the time the slide show was created, that would not have been the case, but at this time, hair color, style, and length were somewhat similar. The words used in the narration also seemed to have an impact on children's recollections. The narrative refers to the "perpetrator" as a "new person" or a "stranger" and uses female pronouns in referencing her. Many children referred to the person who took the camera as a "stranger," which necessitated use of prompts to clarify gender.

The additions of the general instructions and the cards representing Don't Know and Not Here do, in some ways, present a confound. It is possible that the general instructions and the addition of the Don't Know and the Not Here cards affected children's responses. All children in this study received the general instructions. Despite the potential confounds, however, use of the general instructions was appropriate given the age range of children in this study. All eyewitnesses are given instructions (by police, researchers, or other personnel). At least within research, some witnesses are given written instructions. Some of the participating children in this study were not able to read. They did not always understand some vocabulary words (e.g., it became clear that many younger children did not know what it meant when two people "agreed" on something). As suggested by Saywitz and Moan-Hardie (1994), presenting young children with oral or written directions about working with a lineup was unlikely to be sufficient. The nonverbal response options and general instructions and demonstration were designed to address the needs of young children for meaningful directions about an unfamiliar task without providing specific "training."

Methodologically, the timing variable proved relatively unreliable. It was difficult to determine the point at which to begin timing. Often the child could see the array and would have started to make a response before the interviewer finished the last reminder. Human error and occasional mechanical failure led to failures in accurately starting or stopping the stopwatches. It is likely (although it was not directly assessed) that the inter-rater reliability on the timing variable was poor.

Initially, comparisons were planned with prior research where a similar main lineup array was used. There were, however, more limitations than anticipated in comparisons between this research and the "base line" research

done with the slides approximately ten years ago. The degradation in quality of the stimulus material may have affected response accuracy. There is no way to separate effects of changes in stimulus quality and method of presentation (video) from the effect of the general instructions. In addition, the age range of children in this study was different. As was seen in the comparison of this study with other research, it is important to note that response accuracy often varies, even between studies using the same stimulus materials and lineup arrays (e.g., Dekle et al., 1996; Beal et al., 1995).

Another limitation is imposed by the nature of the data itself. Categorical data limits the type of statistical analyses that can be used to nonparametric statistics. Nonparametric statistical analyses are less powerful than the parametric analyses, and thus there is less likelihood of detecting a significant difference if it is there. Many of the analyses presented in this paper had insignificant results. In some cases, a review of the data suggests that the differences between groups were in fact small. However, it is possible that differences existed, and that some associations and interactions were significant, that were not detected. As discussed in Results, combining categories of variables permitted most analyses that could be carried out to be conducted with sufficient cell sizes, thus preserving power.

Ecological Validity and Generalizability

This research examined the response accuracies of child witnesses in making lineup identifications. The video presentation is a good replica of a situation where a child is a bystander. The distractor tasks provided a delay, albeit a short one, between the event and the recognition task. The lineup that the child viewed is a fair lineup and may well be a more difficult lineup than what would be encountered by witnesses. A limitation that is common to this study and to real situations is that it is possible, when a witness makes an

identification from a lineup, that the witness is choosing the person he or she has seen before, not solely the person who is the "target" (e.g., stole the camera). The use in this study of photographic lineup arrays is consistent with police practice.

A valid criticism of much of the experimental research on child eyewitnesses, including this study, is that the research does not examine the effects of trauma on children's memory and eyewitness performance (e.g., Pynoos &Eth, 1984). Much of eyewitness research, including this study, can be generalized only to incidents where the witness is, in essence, an "unaffected bystander" (Yuille, 1993, p. 572). Researchers familiar with clinical cases have advocated the importance that emotional contexts may have on memory (e.g., Jones & Krugman, 1986). Pynoos and Eth, in their article on child homicide witnesses, stated that "[f]rom our observations, we believe that the traumatic nature of the parent's death causes multiple, enduring effects on memory content and function" (1984, p. 95). Certainly, it is (and should be) unethical to subject children to trauma (whether real or perceived). Future research would benefit by increasing ecological validity by including a task in which the child is more of a participant. In addition, as noted by Jones and Krugman (1986), clinical case studies or reviews of cases where children have been exposed to traumatic situations provide a basis not only for examination of those specific circumstances but also a basis for development of experimental research. Case studies have their limitations. However, Pynoos and Eth's model (1984), of partnering with the police and community agencies and following child witnesses from shortly after the traumatic event throughout the legal proceedings is a positive step toward addressing these research concerns as well

as promoting greater understanding among professionals who are interacting with child witnesses.[54]

The results of this study are generalizable to situations where children ages 3 to 8 years, who are uninvolved witnesses, are involved in making photographic lineup identifications. Further research with a larger subject population more diverse in terms of race and socioeconomics would be needed to generalize beyond a population similar to the one in this study.

Policy Implications

"The task for researchers is to present a clear picture to law enforcement agencies as to the need for procedural changes and the form that such changes should take" (Steblay, 1997, p. 286). The conclusions from this research support some recommendations for procedural changes.

As has been discussed in general eyewitness research and highlighted in the wrongful conviction research, eyewitness evidence should be viewed with some caution. However, eyewitnesses can provide helpful and accurate information. Some children, including some very young children, have the abilities to provide accurate eyewitness identifications. A child should not be excluded as a witness because he or she is very young. Likewise, a child should not be discounted as a witness, even if his or her initial description of the event is limited or unclear (e.g., Beal, Schmitt, & Dekle, 1995). However, those interacting with child witnesses need to be aware of children's development and capacities.

In regard to specific procedural changes, it is recommended that young children who are asked to make lineup identifications be provided with nonverbal response options, as well as with instructions and demonstrations of

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[54] In designing any such studies, researchers would need to take care to address the ethical concerns related to potential conflict of interest between clinical needs and research interests.

the appropriate use of the three possible response options (choosing the "target" person who is in the lineup, indicating that the person is not there, or a Don't Know response). Verbal instructions alone should not be assumed sufficient. It is also recommended that they participate in training and practice with actual lineup arrays (constructed so that the arrays do not pose a confound with the actual array that the child will be asked to view). Where possible, the person working with the child should not be involved in the ongoing investigation for which the child is a witness, in order to protect against bias (e.g., Wells et al., 2000). While more research into training processes and their effects is recommended, the results of this study indicate that training does not decrease the accuracy of child witnesses. At worst, it makes no difference. At best, it significantly increases response accuracy. Training procedures would not be particularly complicated nor expensive to implement. They do not require extensive or expensive supplies or equipment. Although the person conducting the training would need some instruction in doing so, there is no need for a professional degree or highly specialized coursework. The risk of implementing training would appear to be low, and the potential benefits significant.

Finally, police, researchers, and others working with children should pay attention to how they consider Don't Know responses. While "Don't Know" is not the "accurate" answer to the lineup arrays, it may be the accurate reflection of the witness' knowledge (or lack thereof) to the question at hand.

Directions for Future Research

Given the relative lack of studies that have focused upon the younger children, and yet the significant concern with younger children's abilities as witnesses, it is recommended that future studies include very young children.

It is recommended that the current protocol, in which some children received extensive training with lineup arrays, be replicated under conditions in

which some of the existing methodological limitations are removed. A larger number of subjects is needed in order to permit a more complete examination of interaction effects. One of the theories to reducing the difficulty caused by limited cell size is to sample until sufficient frequencies are obtained (e.g., Tabachnick and Fidell, 2001). A challenge for analyses in the Lineup Absent condition was a low cell size in one of the cells. Although certainly not the only source of low cell frequencies, this one bears examination, as it was the one for children who correctly rejected the lineup without receiving training (in this study, one child). It would be interesting, in a study with a larger sample, to see if this trend continued. In order to increase the options available for statistical analyses, designs should be considered that would provide for non-categorical accuracy data and thus permit parametric statistics. One potential option could be for subjects to view multiple videos and lineup arrays (such as viewing three videos and three arrays); the total score would be the accuracy score (Ward, Thomas, March, 2004, personal communication). Alternatively, logit analysis may provide valuable additional information, as it permits increased degrees of freedom by treating one of the variables as a dependent variable (Ward, Thomas, personal communication, March 2004; see also Miller et al., 2002).

In regard to the current protocol, the stimulus could be improved if it were recreated using modern technology. Computers offer many advantages for presentation of training materials as well as experimental tasks. As Wells and colleagues noted, computers offer an option as the "blind" presenter, unaware of the experimental condition (2000). They also capture children's attention. However, at its heart, children's eyewitness research has to fit within the system within which it must operate, in police stations, social work offices, child advocacy centers, and courtrooms.

Continued research is recommended into what appear to be different processes underlying children's approach to decision-making in Lineup Present and Lineup Absent conditions. In addition, alternative lineup presentation techniques should continue to be explored, with the caution that what has been shown to be true for adults may not be true for children and that legal implications of alternative presentations must be considered. It is important to recognize that even when research into adult eyewitnesses has reached consensus on some techniques for improving adult eyewitness accuracy, these techniques must be independently studied for child eyewitnesses, because the results may well not be the same (see, e.g., Parker and Myers).

It is recommended that future research focus more on what types of training are effective. It seems that training that most closely resembles the actual task (such as using actual photographs, in an array) is the best area in which to focus. Children's decision-making and communicative abilities in relation to the processes underlying recognition and recall should be considered in light of the growing evidence of children's cognitive development. The training tasks may well need to vary more in response to children's ages and developmental levels.

The developmental, communication, and social factors affecting the use of uncertainty in response options are areas for investigation. The reasons why more children used the Don't Know option in this study, as compared to others, cannot be sufficiently addressed. Other studies that have not included nonverbal response options and general instructions may be able to provide some baseline information. However, most studies do include nonverbal (written) response options and general instructions that the witnesses are able to understand. In addition, researchers have often not reported Don't Know responses or excluded them from analyses. It is recommended that researchers include the Don't Know response option in their studies and, therefore, that instructions and training

include Don't Know as a valid response option. Researchers, as well as policy makers, need to consider how they view Don't Know responses. In searching for a result, "I don't know" is not the answer that is usually being sought. It may, however, be the accurate answer, and accuracy should be the goal.

Increasing focus on the cognitive and communicative skills with which children are making and communicating their decisions, and upon the different decision making processes at play in Lineup Absent and Lineup Present conditions, will further the understanding of children's abilities and how they can be best developed. With this understanding, researchers can continue to examine and to propose changes to system variables that may impact children's abilities to be accurate eyewitnesses.

Conclusion

Children will continue to play an important role within the justice system. To write them off as poor witnesses would be unfair, both to them and to the system itself. It is clear that some children, including very young children, are able to provide accurate information, including eyewitness identifications. This author would recommend that children be provided with clear instructions, including demonstrations of response options, and with training before they are asked to make lineup identifications.

Children will never be, nor should we expect them to be, the same witnesses that adults are. However, the abilities of child witnesses should be further examined and explored, with the same focus as has been applied to adult eyewitness research. The abilities that children do have are too important to be ignored. We cannot determine when a child will be the best, or only, witness. We owe society, and its children, the commitment to work to understand how to help them to use their abilities to the greatest extent possible.

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Appendix A: Consent Form

Parent/Guardian Initials _____

Drexel University

Permission to Take Part In a **Research Study**

1. **Parent/Guardian's Name: _____**

   Child's Name: _____

2. **Title of Research: Young Eyewitnesses: An Examination of Young Children's Response Accuracy to Target Present and Target Absent Lineup Arrays Following Training Procedures**

3. **Principal Investigator's Name:** Kirk Heilbrun, Ph.D.
   Co-Investigator's Name: Dominique Huneycutt, M.A., J.D.

4. **Consenting for the Research Study:**

   This is a long and an important document. If you choose to sign it, you will be authorizing your child to participate in a research study conducted by Drexel University and its researchers. Please take your time and carefully read it. You can also take a copy of this consent form to discuss it with your family member, physician, attorney or any one else you would like before you sign it. Do not sign it unless you are comfortable in participating in this study.

5. **Purpose of Research:**

   Your child is being asked to participate in a research study. This study is conducted by a graduate student as a partial fulfillment of her Ph.D. in clinical psychology. The purpose of this study is to learn more about children's abilities to be accurate witnesses. Specifically, this study looks at children's abilities to work with "lineups" (a series of pictures from which the child is asked to make choices). This study will involve approximately 200 children between the ages of 3 and 8. Participating schools/ learning centers/ day care centers include Trinity Lutheran School, Bright Horizons Learning Center, and the United Jewish Community of the Virginia Peninsula (UJC). Many of the children in this study will be students at your child's school/ learning center/ day care. Your child's school/ learning center/ day care has agreed to participate in this study. Parents and guardians of children in preschool through third grade are being asked to allow their children to participate.

Parent/Guardian Initials _____

All children can participate in this study. However, some children may have difficulty taking part in this study and most information provided by children who have such difficulties cannot be used. Your child may have difficulty taking part in this study if he or she:

Is not able to speak or to understand spoken English;
Requires significant special education support;
Or has a significant vision (eye) or hearing (ear) difficulty that is not corrected by glasses/contacts, hearing aids, or special seating arrangements.

If either you or your child's teacher indicates that your child has one of these difficulties, your child can still participate in the study if the teacher agrees that your child's participation is appropriate. However, if your child has one of these difficulties, researchers will not be able to use most of the information provided by your child.

You may choose not to allow your child to participate in this study. <u>If you do not want your child to participate, please do not sign this form</u>.

Your child may also choose, at any time, not to participate in this study.

6. PROCEDURES AND DURATION:

The following describes what your child will experience if he or she participates in this research study.

Each child is seen individually. Each child is seen one time. The study takes about 30-40 minutes. The study will take place at your child's school/ learning center/ day care. The person working with your child during the experiment will find out whether your child knows basic shapes and colors that are used in the experiment. This person will tell your child the names of any colors or shapes that he or she does not know.

Your child will watch a short video (3 to 5 minutes). The video shows people at a picnic. During the picnic, a new woman appears in the video and takes a camera that does not belong to her. Your child will then watch a short cartoon video. Your child will then be asked what happened in the first video.

There are different types of lineups (series of pictures). As an example, if you are looking for a red square, the lineup may or may not contain the picture of the red square. Three possible results of looking at a lineup are to make a choice (pick one of the pictures); to reject the lineup (the person or thing is not there); or to not be able to tell one way or the other ("don't know").

Your child will be given instructions about working with a lineup (a series of pictures and symbols). Puppets are used in this demonstration. Your child will see three different lineups (series of pictures) of colored shapes (such as red square) and symbol cards (representing answer choices of "not there"

Parent/Guardian Initials _____

and “don’t know”). Your child will be taught about 3 possible results of looking at a lineup.

Some children will then be taught more specifically about working with lineups. The lineup has black-and-white pictures of men and symbol cards (representing answer choices of “he is not there” and “don’t know”). These children will practice working with 6 different lineups (series of pictures and symbols).

Some children will not be given this additional instruction and practice. They will play games using the same black-and-white pictures.

All children will be given a review of the instructions for working with a lineup and a review of the possible results of looking at a lineup. All children will then view one lineup of black-and-white pictures of women. There will also be symbol cards that represent answer choices of “she is not there” and “don’t know.”

Your child will be asked to pick out the woman from the video who took the camera, if she is in the group of pictures. The time it takes your child to make a choice will be measured.

Your child will then watch two puppets as they talk to each other. One puppet is giving directions to the other to pick a colored shape from a group of pictures. The second puppet chooses. The first puppet agrees or disagrees with the choice. After watching three examples, your child will watch 5 interactions between the puppets. When the puppets disagree, your child is asked which puppet made a mistake.

Your child will receive a sticker at the end of the experiment.

7. RISKS AND DISCOMFORTS/CONSTRAINTS:

This experiment is designed to be enjoyable for your child. There are few, if any, potential risks or discomforts for your child. There are no risks to your child other than what he or she normally experiences during daily activities. The video presented to your child shows a woman taking a camera from a picnic. It does not show any violence or fighting. The only possible discomfort is the minor change to his or her daily routine. Your child will be seen individually, for approximately 30 to 40 minutes, during the time your child is at his or her school/learning center/day care. Therefore, his or her daily routine may change slightly on that day. The school, the teachers, and the people involved with the experiment will work together to minimize disruptions to your child’s daily schedule. The school/learning center/day care and the teachers will determine the time at which your child can participate.

Parent/Guardian Initials _____

The people involved with this research will make every effort to prevent any unforeseen risks. In the unlikely event that any unforeseen risks should occur, the teacher(s) and the school principal or learning center/day care owner/director will immediately be notified. In cooperation with the school/learning center/day care, parent(s) /guardians would be notified if appropriate. Researchers will assess any unforeseen risks or concerns and take corrective actions as appropriate.

8. BENEFITS:

There may or may not be any direct benefits to you or your child from participating in this study. However, it is likely that your child will enjoy the activities and the one-to-one interaction. Depending on the outcome, this study may assist professionals (including teachers, social workers, psychologists, and police) in increasing the ability of child witnesses to participate as eyewitnesses.

9. VOLUNTARY PARTICIPATION:

Volunteers: Participation in this study is voluntary. You can refuse for your child to be in this study at any time. Your child can refuse to be in the study or stop at any time. There will be no negative consequences to your or to your child if you or your child decide not to participate or to stop.

10. STIPEND/REIMBURSEMENT:

Your child will be given a sticker after he or she participates.

11. CONFIDENTIALITY:

All data obtained in this study will be kept confidential. In any publication or presentation of research results, you and your child's identity will be kept confidential, but there is a possibility that records which identify you may be inspected by authorized individuals such as the Institutional Review Board (IRB), or employees conducting peer review activities.

12. OTHER CONSIDERATIONS:

If new information or significant new findings become known that will affect you or your child or might change your decision for you/your child to be in this study, you will be informed by the investigator. You may change your decision for your child to be in the study. If you or your child have any questions at any time about this study or about your/your child's rights as a research subject, you/your child may contact Dr. Heilbrun at (215) 762-3634, Dominique Huneycutt at (757) 890-9117, and the Office of Research Compliance at (215) 762-3453.

Parent/Guardian Initials _____

13. CONSENT:

- **I have been informed of the reasons for this study.**
- **I have had the study explained to me.**
- **I have had all of my questions answered.**
- **I have carefully read this permission form, have initialed each page, and have received a signed copy.**
- **I gave permission voluntarily.**

_____ _____
Parent(s) or Guardian Date

_____ _____
Investigator, Co-investigator or Individual Obtaining Permission Date

List of Individuals Authorized to Obtain Permission

Name	Title	Day Phone #	24 Hr. Phone #
Kirk Heilbrun, Ph.D.	Investigator	215 762 3634	215 762 345
Dominique Huneycutt, M.A., J.D.	Co-investigator	757 890 9117	757 890 9117
Rebecca P. Dollins	Owner (Bright Horizons Learning Center)	757 875 5669	
Carmela Malkin-Kuhn	Education Director (United Jewish Community of the Virginia Peninsula)	757 930 1422	
Leanne B. Reynolds	Head of School (Trinity Lutheran School)	757 245 2576	

Appendix B: Assent Form

Child's Initials _____

Drexel University

ASSENT FORM FOR CHILDREN/MINORS IN A RESEACH STUDY

(Experimenter, please read aloud. Ask the child to read along if he/she wishes).

You are being asked to take part in a research study. I am going to ask you to watch some videos. Then I am going to ask you some questions about what you saw. I am also going to show you some pictures. I will tell you about the pictures. Sometimes you will watch puppets choosing certain pictures. Sometimes I will ask you to choose certain pictures.

Your parents, your teacher, and your principal know that I am asking you to spend time with me on this study and it is ok with them. But if you do not want to, you do not have to.

Child's Assent: I have been told about the study and know why it is being done and what to do. I also know that I do not have to do it if I do not want to. If I have questions, I can ask you, my parents, my teacher, or my principal. I can stop at any time. My parents/guardian know that I am being asked to be in this study.

_____ _____

Child's Signature **Date**

List of Individuals Authorized to Obtain Assent

Name	Title	Day Phone #	24 Hr. Phone #
Dominique Huneycutt, M.A., J.D.	Co-investigator	757 890 9117	757 890 9117
Terri Chisman, B.A.	Key personnel	757 898 6250	757 890 9117
Jean Huneycutt, B.A.	Key personnel	757 890 9117	757 890 9117
John C. Iorio, J.D.	Key personnel	610 293 0533	757 890 9117
Rebecca P. Dollins	Owner (Bright Horizons Learning Center)	757 875 5669	
Carmela Malkin-Kuhn	Education Director (United Jewish Community of the Virginia Peninsula)	757 930 1422	
Leanne B. Reynolds	Head of School (Trinity Lutheran School)	757 245 2576	

Appendix C: Parent Letters

Dear UJC Families,

I am a graduate student in the Law/Psychology program at Drexel University/Villanova Law School in Philadelphia, Pennsylvania. I graduated from Dartmouth College and then attended graduate school, where I have completed my Master's Degree in Clinical Psychology and my law degree. I am excited to have returned home to this area. I grew up here, attending Trinity Lutheran School and Hampton Roads Academy. I am currently working on my dissertation in order to complete my doctoral degree (Ph.D.) in clinical psychology.

My dissertation is about children's abilities to be accurate witnesses. The role of children in the legal system continues to increase. Children may be involved in the legal system as witnesses and/or as victims. As eyewitnesses, they may be asked to make an eyewitness identification by picking someone from a lineup. The importance given to eyewitness identifications has raised concerns that children may often make mistakes (false identifications). My dissertation focuses upon children's abilities to work with "lineups" (a series of pictures from which the child is asked to make choices). I am looking at factors that may affect children's accuracy, including age; how the lineup is presented; and training and practice. One of my goals is to study whether factors, such as the way that a lineup is presented and/or training/practice with lineups, can lead to improvements in children's accuracy. This is an important area for study because children may be able to provide valuable information but their abilities as witnesses may be underestimated or not understood.

This study is described in detail in the consent form. Please do not discuss these details (such as what happens in the video or that lineup arrays will be presented) with your child in advance, in order for this study to be as close to a "real-world" experience as possible.

As a summary, each child will see a short video depicting a picnic. During this video, someone takes a camera that does not belong to them. Each child will then see a short cartoon video. Neither video has any violence or fighting. Following the videos, children will be given basic information and instructions about lineup arrays (series of pictures). Some children will be provided with more extensive training and practice with lineup arrays while others will not (in order to study whether training and practice are effective). All children then will be shown a lineup array. Some of the arrays will include a picture of the person who took the camera and some will not. All children will be asked to pick out the person who took the camera if the person is there. Each child will also participate in an activity, involving puppets, that assesses their ability to identify errors when the puppets have not effectively "talked" to each other.

Your child's school and day care have agreed to allow me to conduct research at the UJC. I have extensive training and experience in working with young children. The people assisting me are close friends or family members who are college graduates and have experience working with children. All have been provided with additional training.

I would like to invite your child to participate in my dissertation research study. In addition to this letter, please carefully read the consent form. Although long, it is important and it contains a detailed description of this study.

If you wish to give permission for your child to participate in this study,

> please initial each page of the consent form and sign the last page.
> I will return to you a copy of the signed form.
> Please also return the one-page questionnaire that provides me with basic information about your child.

If your child has attended Trinity Lutheran School during the current (2003-04) school year or during the 2002-03 school year, or has attended Bright Horizons Learning Center during the current (2003-04) school year or during this past summer (2003), you may have already received information about this study. Each child may participate once in this study. If you have already received this request, please accept my apologies for any duplication.

If at any time you have any questions about this study or would like a copy of the results, please feel free to contact me. I can be reached by phone at 757-890-9117 or by email at dhuneycutt@earthlink.net. UJC staff will also know how to reach me. If you would like to meet with me in person, please contact me. It would be my pleasure to schedule a time during the week to meet with you at the UJC.

I am really excited about my dissertation and about the opportunity to work with the children at the UJC.

Thank you very much for your consideration.

Sincerely,

Dominique Huneycutt, M.A., J.D.
Doctoral Candidate
Law/Clinical Psychology Program
Drexel University

Dear Bright Horizons Parent,

I am a graduate student in the Law/Psychology program at Drexel University/Villanova Law School in Philadelphia, Pennsylvania. I graduated from Dartmouth College and then attended graduate school, where I have completed my Master's Degree in Clinical Psychology and my law degree. I am excited to have returned home to this area. I grew up here, attending Trinity Lutheran School and Hampton Roads Academy. I am currently working on my dissertation in order to complete my doctoral degree (Ph.D.) in clinical psychology.

My dissertation is about children's abilities to be accurate witnesses. The role of children in the legal system continues to increase. Children may be involved in the legal system as witnesses and/or as victims. As eyewitnesses, they may be asked to make an eyewitness identification by picking someone from a lineup. The importance given to eyewitness identifications has raised concerns that children may often make mistakes (false identifications). My dissertation focuses upon children's abilities to work with "lineups" (a series of pictures from which the child is asked to make choices). I am looking at factors that may affect children's accuracy, including age; how the lineup is presented; and training and practice. One of my goals is to study whether factors, such as the way that a lineup is presented and/or training/practice with lineups, can lead to improvements in children's accuracy. This is an important area for study because children may be able to provide valuable information but their abilities as witnesses may be underestimated or not understood.

This study is described in detail in the consent form. Please do not discuss these details (such as what happens in the video or that lineup arrays will be presented) with your child in advance, in order for this study to be as close to a "real-world" experience as possible.

As a summary, each child will see a short video depicting a picnic. During this video, someone takes a camera that does not belong to them. Each child will then see a short cartoon video. Neither video has any violence or fighting. Following the videos, children will be given basic information and instructions about lineup arrays (series of pictures). Some children will be provided with more extensive training and practice with lineup arrays while others will not (in order to study whether training and practice are effective). All children then will be shown a lineup array. Some of the arrays will include a picture of the person who took the camera and some will not. All children will be asked to pick out the person who took the camera if the person is there. Each child will also participate in an activity, involving puppets, that assesses their ability to identify errors when the puppets have not effectively "talked" to each other.

Your child's learning center has agreed to allow me to conduct research at Bright Horizons. I have extensive training and experience in working with young children. The people assisting me are close friends or family members who are college graduates and have experience working with children. All have been provided with additional training.

I would like to invite your child to participate in my dissertation research study. In addition to this letter, please carefully read the consent form. Although long, it is important and it contains a detailed description of this study.

If you wish to give permission for your child to participate in this study,

> please initial each page of the consent form and sign the last page.
> I will return to you a copy of the signed form.
> Please also return the one-page questionnaire that provides me with basic information about your child.

If your child attended Trinity Lutheran School during the 2002-03 school year, or Bright Horizons Learning Center during this past summer (2003), you may have already received information about this study. Each child may participate once in this study. If you have already received this request, please accept my apologies for any duplication.

If at any time you have any questions about this study or would like a copy of the results, please feel free to contact me. I can be reached by phone at 757-890-9117 or by email at dhuneycutt@earthlink.net. Bright Horizons staff will also know how to reach me. If you would like to meet with me in person, please contact me. It would be my pleasure to schedule a time during the week to meet with you at Bright Horizons.

I am really excited about my dissertation and about the opportunity to work with the children at Bright Horizons.

Thank you very much for your consideration.

Sincerely,

Dominique Huneycutt, M.A., J.D.
Doctoral Candidate
Law/Clinical Psychology Program
Drexel University

Dear Trinity Parent,

I am a graduate student in the Law/Psychology program at Drexel University/Villanova Law School in Philadelphia, Pennsylvania. I graduated from Dartmouth College and then attended graduate school, where I have completed my Master's Degree in Clinical Psychology and my law degree. I am excited to have returned home to this area. I grew up here, attending Trinity Lutheran School and Hampton Roads Academy. I am currently working on my dissertation in order to complete my doctoral degree (Ph.D.) in clinical psychology.

My dissertation is about children's abilities to be accurate witnesses. The role of children in the legal system continues to increase. Children may be involved in the legal system as witnesses and/or as victims. As eyewitnesses, they may be asked to make an eyewitness identification by picking someone from a lineup. The importance given to eyewitness identifications has raised concerns that children may often make mistakes (false identifications). My dissertation focuses upon children's abilities to work with "lineups" (a series of pictures from which the child is asked to make choices). I am looking at factors that may affect children's accuracy, including age; how the lineup is presented; and training and practice. One of my goals is to study whether factors, such as the way that a lineup is presented and/or training/practice with lineups, can lead to improvements in children's accuracy. This is an important area for study because children may be able to provide valuable information but their abilities as witnesses may be underestimated or not understood.

This study is described in detail in the consent form. Please do not discuss these details (such as what happens in the video or that lineup arrays will be presented) with your child in advance, in order for this study to be as close to a "real-world" experience as possible.

As a summary, each child will see a short video depicting a picnic. During this video, someone takes a camera that does not belong to them. Each child will then see a short cartoon video. Neither video has any violence or fighting. Following the videos, children will be given basic information and instructions about lineup arrays (series of pictures). Some children will be provided with more extensive training and practice with lineup arrays while others will not (in order to study whether training and practice are effective). All children then will be shown a lineup array. Some of the arrays will include a picture of the person who took the camera and some will not. All children will be asked to pick out the person who took the camera if the person is there. Each child will also participate in an activity, involving puppets, that assesses their ability to identify errors when the puppets have not effectively "talked" to each other.

Your child's school (my alma mater) has agreed to allow me to conduct research at Trinity. I have extensive training and experience in working with young children. The people assisting me are close friends or family members who are college graduates and have experience working with children. All have been provided with additional training.

I would like to invite your child to participate in my dissertation research study. In addition to this letter, please carefully read the consent form. Although long, it is important and it contains a detailed description of this study.

If you wish to give permission for your child to participate in this study,

> please initial each page of the consent form and sign the last page.
> I will return to you a copy of the signed form.
> Please also return the one-page questionnaire that provides me with basic information about your child.

If your child attended Trinity Lutheran School during the 2002-03 school year, or Bright Horizons Learning Center during this past summer (2003), you may have already received information about this study. Each child may participate once in this study. If you have already received this request, please accept my apologies for any duplication.

If at any time you have any questions about this study or would like a copy of the results, please feel free to contact me. I can be reached by phone at 757-890-9117 or by email at dhuneycutt@earthlink.net. Trinity staff will also know how to reach me. If you would like to meet with me in person, please contact me. It would be my pleasure to schedule a time during the week to meet with you at Trinity Lutheran.

I am really excited about my dissertation and about the opportunity to work with the children at Trinity. It is very meaningful to me that I am doing part of my graduate work at the school where I began my education.

Thank you very much for your consideration.

Sincerely,

Dominique Huneycutt, M.A., J.D.
Doctoral Candidate
Law/Clinical Psychology Program
Drexel University

Appendix D: Teacher Questionnaire

YOUNG EYEWITNESSES

TEACHER QUESTIONNAIRE

Dear

Thank you for allowing the children in your classroom to participate in this study.

Every child in your class whose parent returns a permission form can participate in this. However, participation may be difficult for any children who

> are not able to speak or to understand spoken English sentences;
>
> require significant special education support (such as full-time aides, specialized classroom placement) to assist with mental health, behavioral, or significant academic difficulties;
>
> or have any significant visual or auditory impairment that is not correctable by aides such as glasses or hearing aids or by adjustments to viewing distance or sound volume.

Children with any of these challenges may participate in the study if you feel it appropriate for them to do so and if they wish. However, any information obtained from their participation cannot be included in analyses.

If any children in your classroom meet any of the above criteria, please list their names on the attached form.

Again, thank you for your participation. I am looking forward to working with you.

Sincerely,

Dominique Huneycutt, M.A., J.D.

YOUNG EYEWITNESSES

TEACHER QUESTIONNAIRE

Teacher Name:

Grade taught:

_____ The following children in my classroom

are not able to speak or to understand spoken English sentences;

require significant special education support (such as full-time aides, specialized classroom placement) to assist with mental health, behavioral, or significant academic difficulties;

or have any significant visual or auditory impairment that is not correctable by aides such as glasses or hearing aids or by adjustments to viewing distance or sound volume.

Child's name:

_____ None of the children in my classroom meet the above criteria.

Please return this form to Dominique Huneycutt.

Appendix E: Parent Questionnaires

YOUNG EYEWITNESSES

PARENTS/GUARDIAN QUESTIONNAIRE

Dear Parent,

Thank you for allowing your child to participate in the Young Eyewitnesses study. This letter asks you for some information about your child. All information will be kept secure and confidential.

Child's name: Child's birthdate:

Child's gender: male female Child's teacher:

Child's race: Caucasian Asian African-American Other

Child's grade:

All children can participate in this study. However, participation may be difficult for some children with special needs. Please check the blanks if your child

____ is not able to speak or to understand spoken English sentences;

____ requires significant special education support (such as full-time aides, specialized classroom placement);

____ or has any significant eye/vision or ear/hearing difficulty that is not correctable by glasses, contacts, or hearing aids or by special seating arrangements.

Please return this form to the school with the permission form.
Again, thank you for your participation.

Sincerely,

Dominique Huneycutt, M.A., J.D.

YOUNG EYEWITNESSES

PARENTS/GUARDIAN QUESTIONNAIRE

Dear Parent,

Thank you for allowing your child to participate in the Young Eyewitnesses study. This letter asks you for some information about your child. All information will be kept secure and confidential.

Child's name: Child's birthdate:

Child's gender: male female Child's teacher:

Child's race: Caucasian Asian African-American Other

Child's grade:

Child's home school:

All children can participate in this study. However, participation may be difficult for some children with special needs. Please check the blanks if your child

____ is not able to speak or to understand spoken English sentences;

____ requires significant special education support (such as full-time aides, specialized classroom placement);

____ or has any significant eye/vision or ear/hearing difficulty that is not correctable by glasses, contacts, or hearing aids or by special seating arrangements.

Please return this form to the school with the permission form.
Again, thank you for your participation.

Sincerely,

Dominique Huneycutt, M.A., J.D.

Appendix F: Data Collection Record Sheets

YOUNG EYEWITNESSES

Data Sheet 1 of 5

Interviewer Initials: _____

Child's first name, last initial:

Date of Birth: Child's Age:
Today's Date: Child's Grade:

BEHAVIORAL NOTES

During video,

Did child remain in a position to watch the video?

If not (such as getting up, walking around, etc), did child refocus following redirection?

Did child appear to be focused on the video?

If not (such as looking around, closing eyes), did child refocus following redirection?

How many times was the videotape paused for redirection?

How many redirections were given?

In your opinion, did this child sufficiently focus on the video to have had the chance to observe content?

Other notes on child's behaviors during study:

YOUNG EYEWITNESSES

Data Sheet 2 of 5

Interviewer Initials: _____

Child's first name, last initial:

Date of Birth: Child's Age:
Today's Date: Child's Grade:

VIDEO CONTENT

What happened in that first video (prompt if necessary—"not the cartoon")?

Child's answer included (circle)

Lady/Woman stealing camera/taking camera that does not belong to her/not hers (named camera) from/at a picnic

(no prompts/follow-up needed for above)

If child did not refer to ALL those concepts, circle which concepts child did include and see below for prompts.

Woman took camera camera did not belong to her picnic

Stranger took camera Woman/stranger took something

You may need to use prompts for any or all of the four main concepts:

- identifying the person who took the camera as a woman (not just "stranger" or "girl")
- identifying that the camera did not belong to her
- identifying that this happened at a picnic
- identifying the object taken as a camera

Prompts related to PERSON

e.g., (child has said "stranger" or "girl" but not identified as older female)

Stranger taking camera that does not belong to her/not hers from/at a picnic

Girl taking camera that does not belong to her/not hers from/at a picnic

Prompts:

Was the "stranger" was a very young person (like your (child's) age) or an older person?

Was the stranger a man or a woman/woman or a man?

(Did child use female pronouns or male pronouns in referring to stranger/person)?

Prompts related to CAMERA NOT belonging to her

e.g., child has said woman took camera but has not clearly identified that the camera was not hers

Woman taking camera (named camera) (from/at a picnic)

Prompts:

Was it her camera?

Do you think the camera belonged to her or to someone else?

NOTE: If child has not referred to stranger as a woman, refer to person as child does

Where were they when this happened?

Prompts related to PICNIC SETTING

e.g., child has not referred to this taking place at a picnic

Prompts:

Where did this happen?

What were the friends doing when this happened?

Prompts related to identifying object as CAMERA

e.g., child has not identified object taken as "camera"

Woman taking something that takes pictures/is black/other description

Woman taking something that did not belong to her

Woman taking something

NOTE: The child does NOT have to use the word camera. It is ok if the child describes the camera or its function. If it is clear that the child is referring to the "camera" but has not named it, identify it as a camera for the child.

Prompts:

What is that called?

What did they use it for/how was it used?

Prompts related to something being taken

If the child does NOT indicate that anything was taken, you may use prompting questions:

i.e. Did anything unusual happen?
What happened at the end?
Was anything wrong at the end of the video?

If the child still does not indicate that anything was taken, tell the child that it seemed to you that a woman took something that did not belong to her and see end of this form.

SUMMARY

Interviewer---please check any prompts you needed

Identifying person who took camera as a woman _____

Identifying that they were at a picnic _____

Identifiying that the camera did not belong to the woman _____

Identifying object as "camera" _____

Other prompts (notes) :

Child's response to prompts:

Interviewer: If, following prompts, the child did not recall that a woman took something that did not belong to her, tell the child that a woman took something that did not belong to her and check below.

_____ CHILD COULD NOT RECALL, FOLLOWING PROMPTS, THAT A WOMAN TOOK SOMETHING THAT DID NOT BELONG TO HER AND INTERVIEWER PROVIDED CHILD WITH THAT INFORMATION.

COLORS/SHAPES

Did the child know the names for the colors and shapes presented?

Did you need to "teach" any colors or shapes?

Following this, did child seem comfortable with all the colors and shapes?

If not, which ones were difficult for the child?

YOUNG EYEWITNESSES

Data Sheet 3 of 5

Interviewer Initials: _____

Child's first name, last initial:

Date of Birth: Child's Age:
Today's Date: Child's Grade:

If child is in control group, check box---rest of form is n/a.

This child was assigned to card sorting. _____

EXPERIMENTAL GROUP—LINEUP TRAINING

TRAINING TRIAL 1

Note: target card remains visible in Training Trial 1

ORDER of ARRAYS

_____	___DK_____	_____
First array	Second array	Third array

FOR EACH ARRAY:
Identify which card is in each cell.
The ? (DK) card is CARD 4.
The blank (NOT HERE) card is CARD 5.

Interviewer Initials: _____

Child's first name, last initial:

Date of Birth: Child's Age
Today's Date: Child's Grade:

FIRST ARRAY

_____ _____ _____
Cell One Cell Two Cell Three

_____ _____
Cell Four Cell Five

First Attempt, First Array. Circle child's response. If child is Correct, reinforce choice and go on to Second Array. IF incorrect, do NOT give answer but provide explanation (e.g., let's look at the target—what about it looks like) and repeat. Do NOT shuffle card order.

_____ _____ _____
Cell One Cell Two Cell Three

_____ _____
Cell Four Cell Five

Second Attempt, First Array. Circle child's response. If child is incorrect, provide explanation and correct answer.

IF child's verbal response and nonverbal choice are different, note both choices, point out inconsistency, and clarify response choice.

RESPONSE TO FIRST ARRAY

_____ Correct

_____ Correct following first redirection

_____ Incorrect

Interviewer Initials: _____

Child's first name, last initial:

Date of Birth: Child's Age
Today's Date: Child's Grade:

SECOND ARRAY (DK Array)

_____ _____ _____
Cell One Cell Two Cell Three

_____ _____
Cell Four Cell Five

First Attempt, Second Array. Circle child's response. If child is Correct, reinforce choice and go on to Second Array. IF incorrect, do NOT give answer but provide explanation (e.g., let's look at the target—what about it looks like) and repeat.

_____ _____ _____
Cell One Cell Two Cell Three

_____ _____
Cell Four Cell Five

Second Attempt, Second Array. Circle child's response. If child is incorrect, provide explanation and correct answer.

IF child's verbal response and nonverbal choice are different, note both choices, point out inconsistency, and clarify response choice.

CHILD'S RESPONSE TO SECOND ARRAY

_____ Correct

_____ Correct following first redirection

_____ Incorrect

Interviewer Initials: _____

Child's first name, last initial:

Date of Birth: Child's Age
Today's Date: Child's Grade:

THIRD ARRAY

_____ _____ _____
Cell One Cell Two Cell Three

_____ _____
Cell Four Cell Five

First Attempt, Third Array. Circle child's response. If child is Correct, reinforce choice and go on to Second Array. IF incorrect, do NOT give answer but provide explanation (e.g., let's look at the target—what about it looks like) and repeat.

_____ _____ _____
Cell One Cell Two Cell Three

_____ _____
Cell Four Cell Five

Second Attempt, Third Array. Circle child's response. If child is incorrect, provide explanation and correct answer.

IF child's verbal response and nonverbal choice are different, note both choices, point out inconsistency, and clarify response choice.

CHILD'S RESPONSE TO THIRD ARRAY

_____ Correct

_____ Correct following first redirection

_____ Incorrect

Interviewer Initials: _____

Child's first name, last initial:

Date of Birth: Child's Age
Today's Date: Child's Grade:

TRAINING TRIAL ONE _____ (PASS/FAIL)

_____ (correct/incorrect) FIRST ARRAY

_____ (correct/incorrect) SECOND ARRAY

_____ (correct/incorrect) THIRD ARRAY

TRAINING TRIAL 2

Note: target card removed in Training Trial 2

(**represent AFTER child make's choice**)

ORDER of ARRAYS

_____	_____	_____
First array	Second array	Third array

Interviewer Initials: _____

Child's first name, last initial:

Date of Birth: Child's Age
Today's Date: Child's Grade:

FIRST ARRAY, TRAINING TRIAL 2

_____ _____ _____
Cell One Cell Two Cell Three

_____ _____
Cell Four Cell Five

First Attempt, First Array. Circle child's response. If Correct, SHOW target card, reinforce response. IF incorrect, show target card, leave it visible, and repeat. A "don't know" answer is **positively reinforced (good choice) across all lineup arrays**—if it is LP or LA, show target card and leave visible. If child makes id while viewing DK array, use Qs to show child why DK is the appropriate response.

_____ _____ _____
Cell One Cell Two Cell Three

_____ _____
Cell Four Cell Five

Second Attempt, First Array. Circle child's response. If child is incorrect, provide explanation and correct answer.
IF child's verbal response and nonverbal choice are different, note both choices, point out inconsistency, and clarify response choice.

CHILD'S RESPONSE TO FIRST ARRAY

_____ Correct (**Initial response**. Responses following repeats of target card are NOT counted).

_____ Incorrect

Interviewer Initials: _____

Child's first name, last initial:

Date of Birth: Child's Age
Today's Date: Child's Grade:

SECOND ARRAY

_____ _____ _____
Cell One Cell Two Cell Three

_____ _____
Cell Four Cell Five

First Attempt, Second Array. Circle child's response. If Correct, SHOW target card, reinforce response. IF incorrect, show target card, leave it visible, and repeat. A "don't know" answer is **positively reinforced (good choice) across all lineup arrays**—if it is LP or LA, show target card and leave visible. If child makes id while viewing DK array, use Qs to show child why DK is the appropriate response.

_____ _____ _____
Cell One Cell Two Cell Three

_____ _____
Cell Four Cell Five

Second attempt, Second Array. Circle child's response. If child is incorrect, provide explanation and correct answer.
IF child's verbal response and nonverbal choice are different, note both choices, point out inconsistency, and clarify response choice.

CHILD'S RESPONSE TO SECOND ARRAY

_____ Correct (**Initial response**. Responses following repeats of target card are NOT counted).

_____ Incorrect

Interviewer Initials: _____

Child's first name, last initial:

Date of Birth: Child's Age
Today's Date: Child's Grade:

THIRD ARRAY

_____ _____ _____
Cell One Cell Two Cell Three

_____ _____
Cell Four Cell Five

First Attempt, Third Array. Circle child's response. If Correct, SHOW target card, reinforce response. IF incorrect, show target card, leave it visible, and repeat. A "don't know" answer is **positively reinforced (good choice) across all lineup arrays**—if it is LP or LA, show target card and leave visible. If child makes id while viewing DK array, use Qs to show child why DK is the appropriate response.

_____ _____ _____
Cell One Cell Two Cell Three

_____ _____
Cell Four Cell Five

Second Attempt, Third Array. Circle child's response. If child is incorrect, provide explanation and correct answer.
IF child's verbal response and nonverbal choice are different, note both choices, point out inconsistency, and clarify response choice.

CHILD'S RESPONSE TO THIRD ARRAY

_____ Correct (**Initial response**. Responses following repeats of target card are NOT counted).

_____ Incorrect

Interviewer Initials: _____

Child's first name, last initial:

Date of Birth: Child's Age
Today's Date: Child's Grade:

TRAINING TRIAL TWO _____ (PASS/FAIL)

_____ (correct/incorrect) FIRST ARRAY

_____ (correct/incorrect) SECOND ARRAY

_____ (correct/incorrect) THIRD ARRAY

TRAINING TRIAL ONE **_____ (PASS/FAIL)**

TRAINING TRIAL TWO **_____ (PASS/FAIL)**

YOUNG EYEWITNESSES

Data Sheet 4 of 5

Interviewer Initials: _____

Child's first name, last initial:

Date of Birth: Child's Age:
Today's Date: Child's Grade:

LINEUP IDENTIFACTION

REMEMBER TO TIME!

LINEUP CONDITION: TARGET PRESENT TARGET ABSENT

NOTE: USE EITHER CARD 1 (LP) OR CARD 2 (LA) BUT NOT BOTH.

THE ? CARD (DK) IS CARD NUMBER 8. THE BLANK CARD (NOT HERE) IS CARD NUMBER 9.

ORDER OF ARRAY

_____	_____	_____	_____
Cell One	Cell Two	Cell Three	Cell Four
_____	_____	_____	_____
Cell Five	Cell Six	Cell Seven	Cell Eight

Circle Child's Response.

IF child's verbal response and nonverbal choice are different, note both choices, point out inconsistency, and clarify response choice.

Response Time (seconds): _____

YOUNG EYEWITNESSES

Data Sheet 5 of 5

Interviewer Initials: _____

Child's first name, last initial:

Date of Birth: Child's Age:
Today's Date: Child's Grade:

REFERENTIAL COMMUNICATION
(SPEAKER BLAMER/LISTENER BLAMER)

Speaker puppet: _____

Listener puppet: _____

Trial 1 (Ambiguous)

Puppet identified as making mistake _____

Additional help/information needed _____

Trial 2 (Clear)

Child comments (if any):

Trial 3 (Misleading)

Puppet identified as making mistake _____

Additional help/information needed: _____

Interviewer Initials: _____

Child's first name, last initial:

Date of Birth: Child's Age:
Today's Date: Child's Grade:

Trial 4 (Ambiguous)

Puppet identified as making mistake _____

Additional help/information needed: _____

Trial 5 (Clear)

Child comments (if any):

Coding

Trial #	Identified puppet Speaker (S)/Listener (L)	Correct/Incorrect Identification	Correct/Incorrect Specification on Directions
1(A)			
2			
3 (M)			
4 (A)			
5			

Classification on Ambigious:

Speaker Blamer (SB) Listener Blamer (LB) Transitional (T)

Response on Misleading:

Appendix G: Video Narrative

SLIDE ONE

What fun!!

Look at the people setting up their picnic!

What a nice place for these friends to have their picnic.
They are in a pretty yard next to some apartments!

There is a lot to do for a good picnic. These friends have already started. They have the tablecloth on the picnic table and the cooler is there.

One man is bringing things to the table. While one woman is unpacking the cooler, another woman is putting things on the table.

SLIDE 2	That man is getting the grill ready for cooking while his friends work near the table.
SLIDE 3	Wow—look at all the bags! One of the men is helping his friends unpack more food!
SLIDE 4	The five friends are working well together—it looks like they have everything ready.
SLIDE 5	The grill is ready and he is cooking the hamburgers. Looks yummy.
SLIDE 6	Those two are starting to play a game of frisbee.
SLIDE 7	Looks like he made a Good catch!!
SLIDE 8.	This woman brought her radio to their picnic. She is putting her radio on the table so they can all listen to music.
SLIDE 9	Now look ---she has brought her camera to take pictures of their picnic. It looks like a nice camera.
SLIDE 10	She is taking pictures of the frisbee players! They seem to be having fun getting their pictures made.
SLIDE 11	She's finished taking pictures for now. She's putting her camera down on the table until she's ready to take more pictures.

SLIDE 12 She is being very careful and is putting her camera in a safe place on the table. Good idea—it looks like an expensive camera.

SLIDE 13 Her camera and radio are on the table. Her friends are having fun at the picnic, playing frisbee and eating good food.

SLIDE 14 It looks like a new person is coming in the gate. I wonder if they know her. Maybe she's going to join their picnic.

SLIDE 15 The new person is walking toward the group. They are all busy having fun and nobody sees her.

SLIDE 16 The new person does not seem to be talking to anyone. They are not paying any attention to her, either.

SLIDE 17 She walked right by the group. She seems to be a stranger to them. Maybe she just lives nearby.

SLIDE 18 The friends are busy cooking, talking, and playing frisbee. The stranger seems to be eating some of their food.

SLIDE 19 The stranger seems to be watching the group but they don't notice her at all.

SLIDE 20 The stranger is really looking very closely at the picnic table.

SLIDE 21 What is she doing? While nobody is watching her, she seems to be picking up the camera. That's not her camera.

SLIDE 22 Look—the stranger has something in her hand. And she is turning away from the picnic table and the group of friends.

SLIDE 23. The friends are still busy having fun and the stranger has walked away. Does anything seem to be missing?

SLIDE 24 It looks like she is leaving. We can't see her hands. Is she taking anything with her?

SLIDE 25 The stranger is walking away from the group at the picnic toward a gate at the other end of the yard. She's <u>not</u> looking back.

SLIDE 26 She has gone through that gate and is closing it behind her. She does not seem to be coming back to the picnic**.**

SLIDE 27 It looks like something is wrong. This woman seems to be looking for something.

SLLIDE 28 It looks like she wanted to take more pictures with her camera. She's asking her friends if they have seen her camera.

Appendix H: Arrays Used in General Lineup Instructions

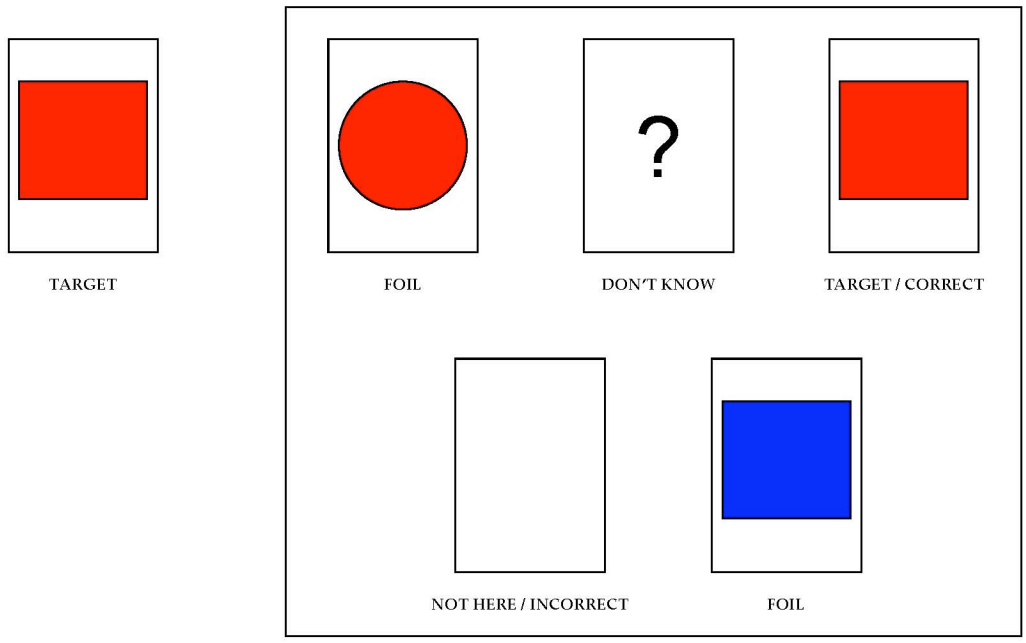


Figure 27: Lineup Present Array, General Instructions

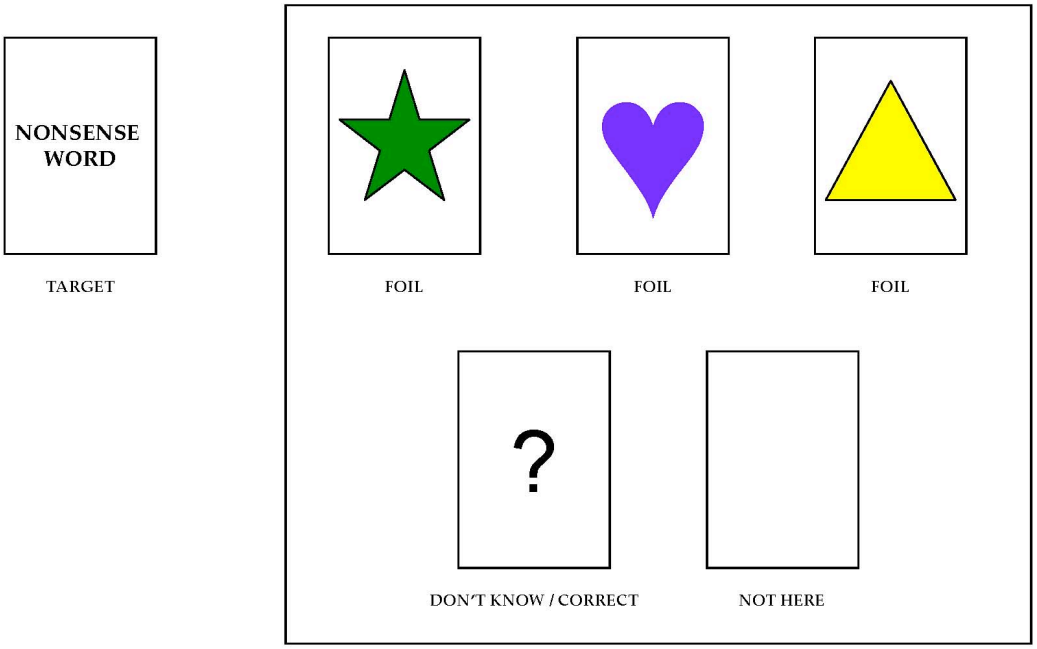


Figure 28: Don't Know Array, General Instructions

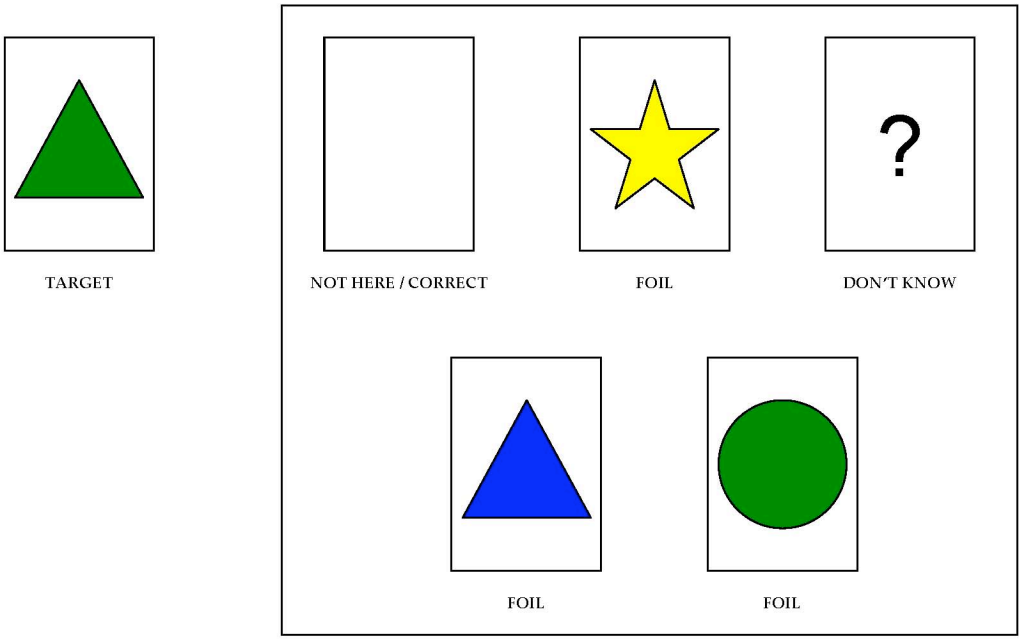


Figure 29: Lineup Absent Array, General Instructions

Appendix I: Training Lineup Arrays

Training Trial 1

There were three arrays in Training Trial 1: the Lineup Present Array, the Don't Know Array, and the Lineup Absent Array. The Don't Know Array was always presented second. The Lineup Present and the Lineup Absent Arrays were presented first or third. The placement of the cards within each array was varied between subjects. For all three arrays in Training Trial 1, the target card remained visible to the child. If the child's initial response was incorrect, the experimenter provided some explanation without providing the answer and repeated the array. The examiner reinforced the use of Don't Know as an appropriate response. However, except within the Don't Know array, a Don't Know response was coded as incorrect and the experimenter provided an explanation as described.

As these lineups were designed for training purposes only and not rated for fairness, all of the "incorrect" photographs were designated as foils (known errors, as opposed to false identifications). A child was considered to be correct on an array if he or she responded correctly either initially or following the first explanation. To pass Training Trial 1, a child had to be correct on 2 of 3 arrays.

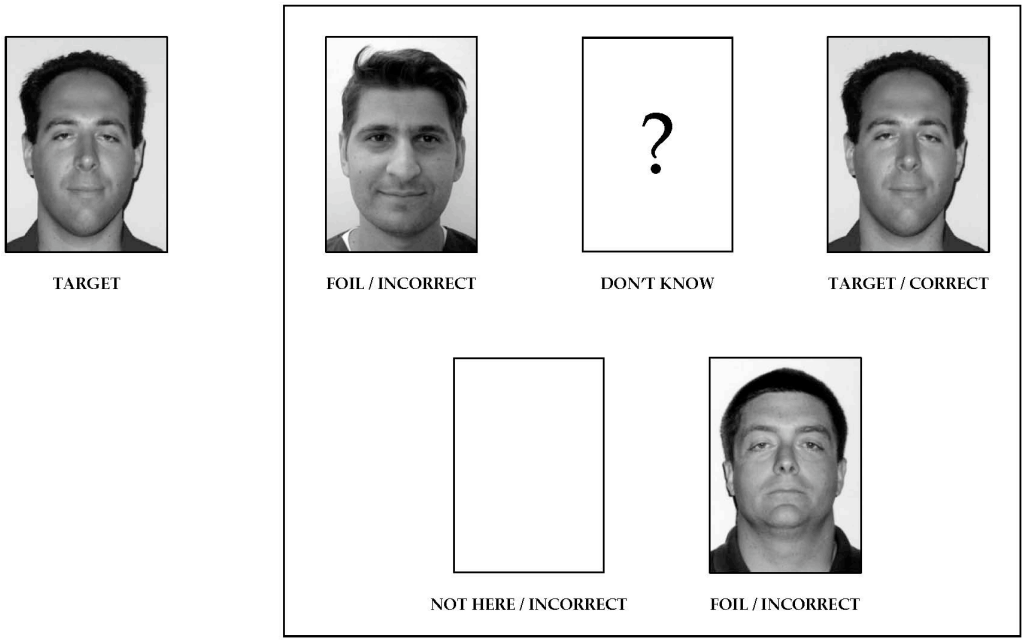


Figure 30: Training Trial 1, Lineup Present Array.

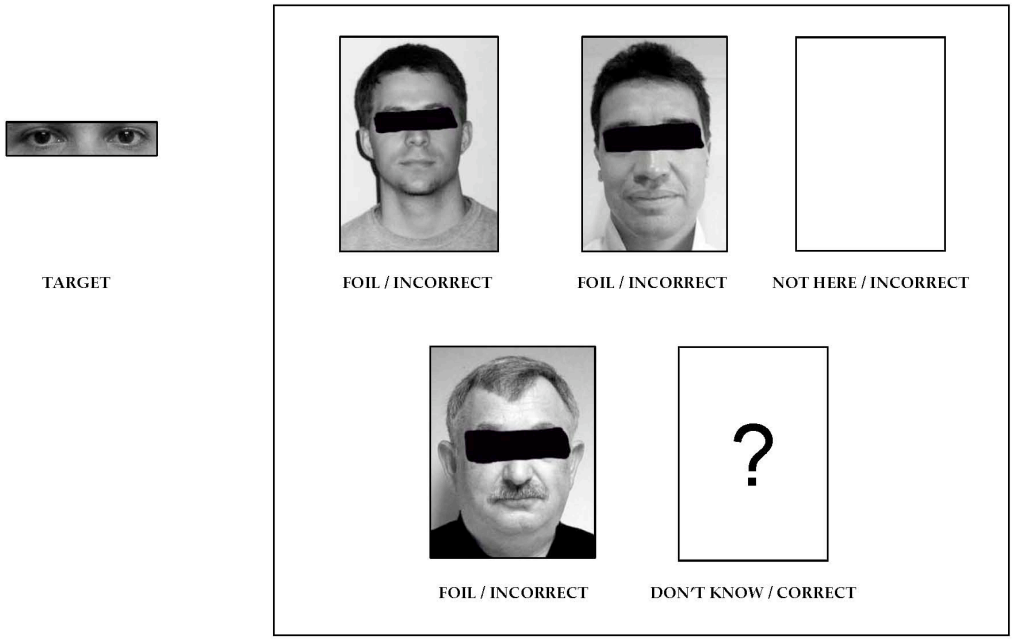


Figure 31: Training Trial 1, Don't Know Array

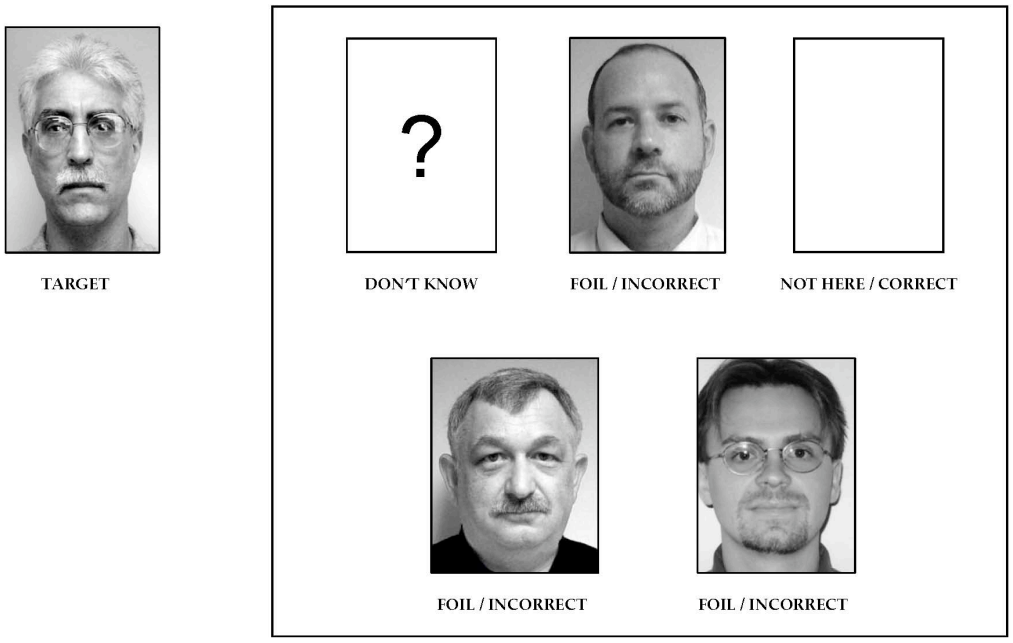


Figure 32: Training Trial 1, Lineup Absent Array

Training Trial 2

There were three arrays in Training Trial 2: the Lineup Present Array, the Don't Know Array, and the Lineup Absent Array. The three arrays were presented in varying orders. The placement of the cards within each array was varied between subjects. For all three arrays in Training Trial 2, the target card was removed from the child's view prior to presenting the child with the array. A child's initial response was the response coded for accuracy. To pass Training Trial 2, a child had to be correct on 2 of 3 arrays.

In order to pass the training trials (overall), a child had to pass either Training Trial 1 or Training Trial 2 or both.

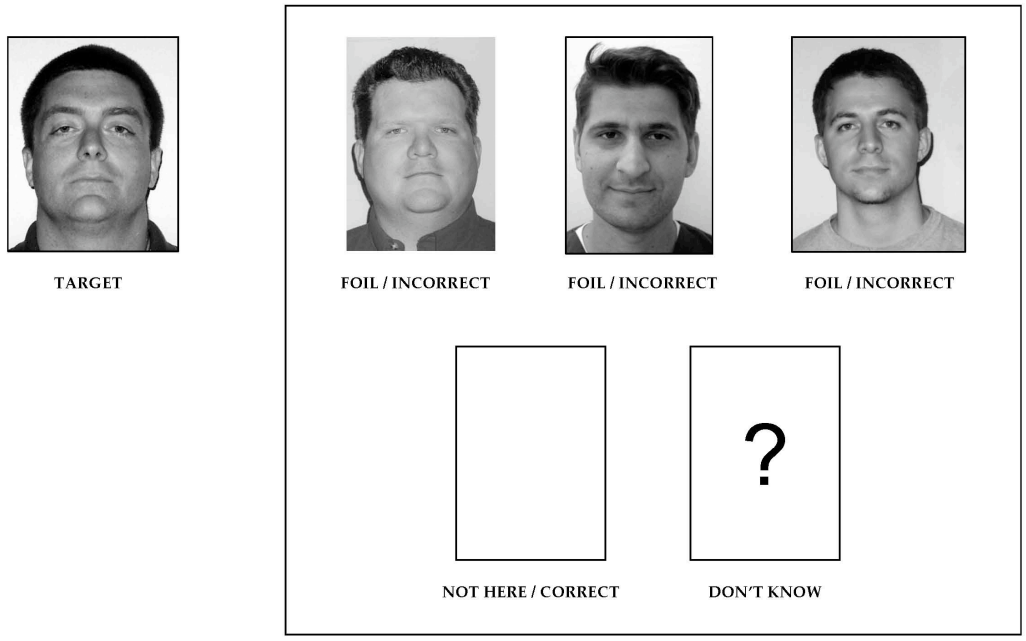


Figure 33: Training Trial 2, Lineup Absent Array

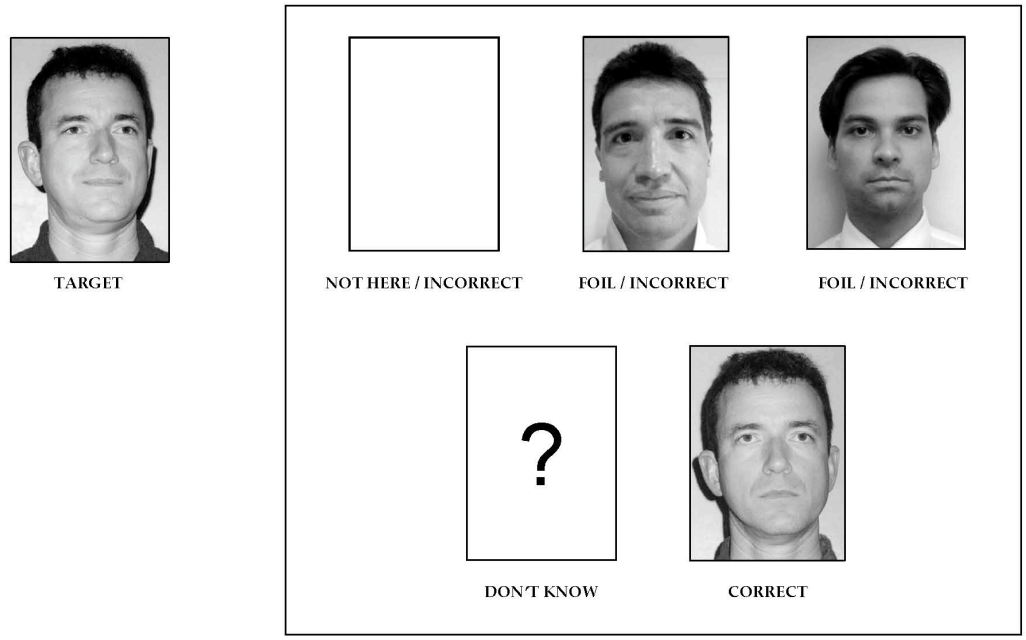


Figure 34: Training Trial 2, Lineup Present Array

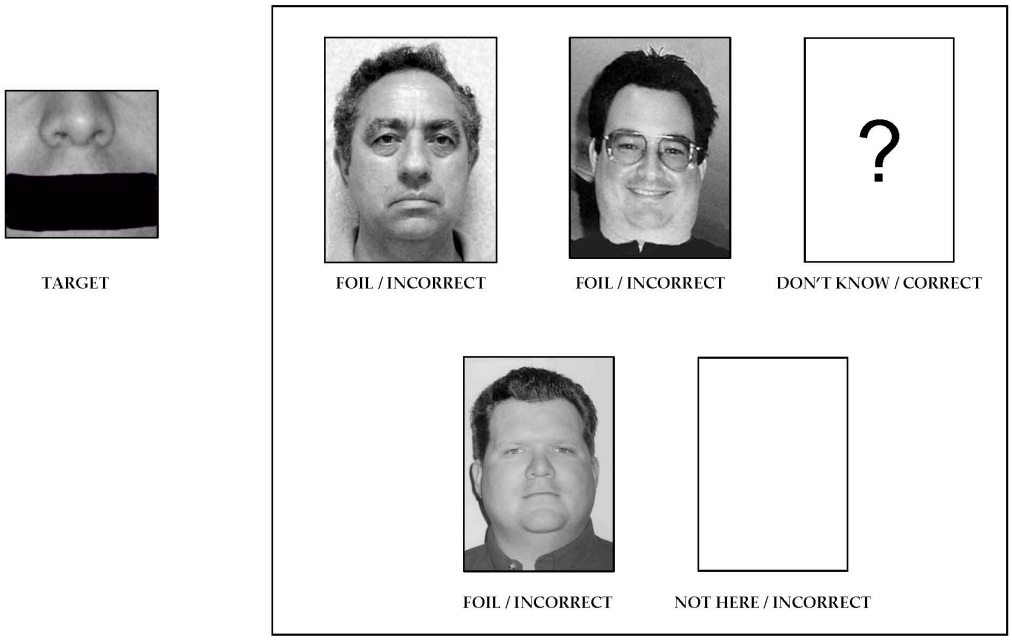
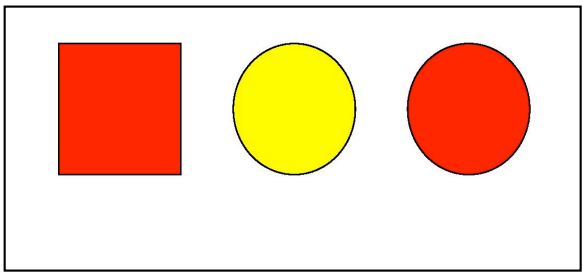
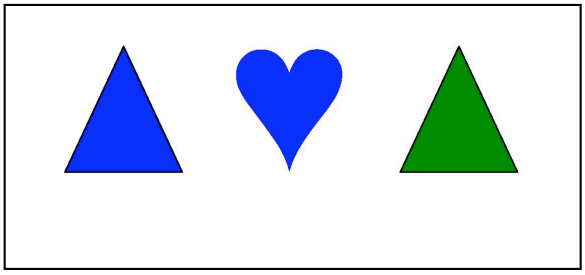
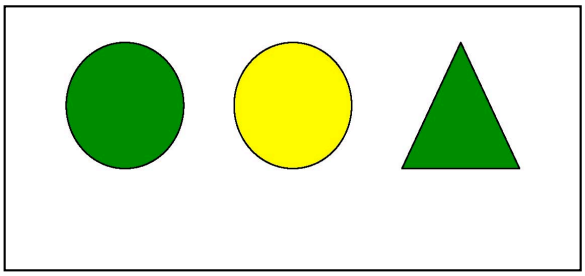
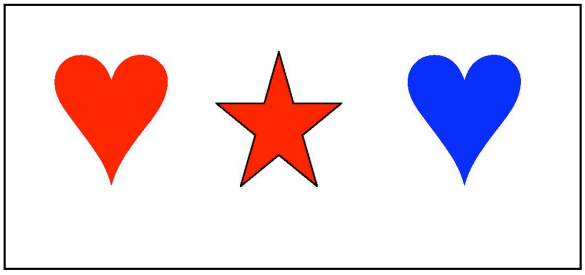


Figure 35: Training Trial 2, Don't Know Array

Appendix J: Examples of Referential Communication Arrays

Sample Arrays

Type of Instruction	Instruction	
Clear	Point to the Red Circle	
Type of Instruction	Instruction	
Ambiguous	Point to the Blue Shape	
Type of Instruction	Instruction	
Ambiguous	Point to the Round Shape	
Type of Instruction	Instruction	
Misleading	Point to ANY Red One	

Appendix K: Main Lineup Arrays

Lineup Present Array

Card 7 (Foil)

?

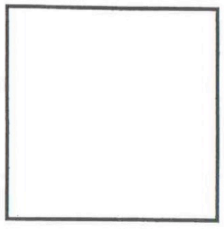
Card 8 (Don't Know)

Card 3 (Foil)

Card 1 (Correct)

Card 4 (Foil)

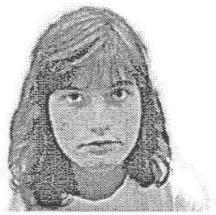
Card 5 (Foil)



Card 9 (Not Here)

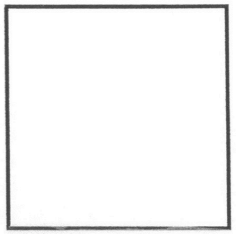
Card 6 (Foil)

Lineup Absent Array



Card 7 (Foil)

Card 2 (Foil)



Card 9 (Not Here)

Card 4 (Foil)

Card 5 (Foil)

?

Card 8 (Don't Know)

Card 3 (Foil)

Card 6 (Foil)

Appendix L: Loglinear Analysis Printout Information

Hierarchical Loglinear

DATA Information

95 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
95 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
MA_CDI	3	Accuracy (correct, Don't Know, incorrect)
LP_LA	2	Lineup type (Lineup Present, Lineup Absent)
EXP_CON	2	Experimental group (Training, Control)

ABBREVIATIONS

OBS	Observed
EXP	Expected
LR Chisq	Likelihood ratio chi square
PROB	Probability
ITER	Iteration

DESIGN 1 has generating class

MA_CDI*LP_LA* EXP_CON

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	2	1.815	.4036	1.717	.4238	2
2	7	15.560	.0295	14.395	.0446	2
1	11	40.401	.0000	37.000	.0001	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	4	24.841	.0001	22.605	.0002	0
2	5	13.745	.0173	12.678	.0266	0
3	2	1.815	.4036	1.717	.4238	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

MA_CDI*LP_LA* EXP_CON

Likelihood ratio chi square = .00000 DF = 0 P = -INF

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
MA_CDI*LP_LA* EXP_CON	2	1.815	.4036	2

Step 1

The best model has generating class

MA_CDI*LP_LA
MA_CDI*EXP_CON
LP_LA*EXP_CON

Likelihood ratio chi square = 1.81483 DF = 2 P = .404

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
MA_CDI*LP_LA	2	9.887	.0071	2
MA_CDI*EXP_CON	2	3.864	.1448	2
LP_LA*EXP_CON	1	.031	.8597	2

Step 2

The best model has generating class

MA_CDI*LP_LA
MA_CDI*EXP_CON

Likelihood ratio chi square = 1.84607 DF = 3 P = .605

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
MA_CDI*LP_LA	2	9.868	.0072	2
MA_CDI*EXP_CON	2	3.846	.1462	2

Step 3

The best model has generating class

MA_CDI*LP_LA
EXP_CON

Likelihood ratio chi square = 5.69191 DF = 5 P = .337

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
MA_CDI*LP_LA	2	9.868	.0072	2
EXP_CON	1	.011	.9183	2

Step 4

The best model has generating class

MA_CDI*LP_LA

Likelihood ratio chi square = 5.70244 DF = 6 P = .457

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
MA_CDI*LP_LA	2	9.868	.0072	2

Step 5

The best model has generating class

MA_CDI*LP_LA

Likelihood ratio chi square = 5.70244 DF = 6 P = .457

The final model has generating class

MA_CDI*LP_LA

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square =	5.70244	DF = 6	P =	.457
Pearson chi square =	5.50623	DF = 6	P =	.481

The tables representing observed and expected frequencies and residuals for the initial, saturated model and for the final model, which are part of the SPSS output, are not presented.

Appendix M: Comparisons with other Research Studies

Comparison of Accuracy Between this Study and Other Research

Lineup Present Arrays

Author	Adult/Child Subject	Condition	Correct Identification	Incorrect Identification	Correct Rejection	Incorrect Rejection	Don't Know	Total
Dekle	Adult		20 (30%)	9 (14%)	NA	17 (25%)	21 (31%)	67
Yarmey1	Adult		.46	.24	NA	.29	excluded	41
Yarmey2	Adult	Immediate	.49	.28	NA	.23	---	35
Yarmey2	Adult	30 min,	.39	.35	NA	.26	---	34
ParkerRyan	Adult	Control	4 (.33)	2 (.17)	NA	6 (.50)	---	12
Dekle	Child		11 (61%)	6 (33%)	NA	0 (0)	1 (6%)	18
Beal	Child	Exp. 1Standard	9 (56%)	6 (37%)	NA	0 (0)	1 (6)	16
Beal	Child	Exp.2Standard	9 (45%)	10 (50%)	NA	1 (5%)	0	20
Parker/Ryan	Child	Control	5 (.42)	4 (.33)	NA	3 (.25)	---	12
Beal	Child	Exp. 2 Modified	8 (50)	7 (44)	NA	1 (6)	0 (0)	16
Current	Child	Control	10 (.39)	13 (.54)	NA	1 (.04)	2 (8)	26
ParkerRyan	Child	Practice	5 (.42)	4 (.33)	NA	3 (.25)	---	12
Current	Child	Training	10 (.39)	10 (.39)	NA	2 (.07)	4 (.16)	26

Lineup Absent Arrays

Author	Adult/Child Subject	Lineup	Correct Identification	Incorrect Identification	Correct Rejection	Incorrect Rejection	Don't Know	Total
Dekle	Adult		NA	20 (30%)	27 (41%)	NA	19 (29%)	67
Yarmey1	Adult		NA	.05 + .23 = .28	.72	NA	excluded	41
Yarmey 2	Adult	Immediate	NA	.16 + .46 = .62	.38	NA	---	37
Yarmey2	Adult	30 min	NA	.33 + .39 = .72	.28	NA	---	39
ParkerRyan	Adult	Control	NA	4 + 3 = 7 (.33 + .25 = .58)	5 (.42)	NA	---	12
ParkerRyan	Adult	Practice	NA	3 + 0 = 3 (.25 + 0 = .25)	9 (.75)	NA	---	12
Dekle	Child		NA	11 (61)	7 (39)	NA	0 (0)	18
Beal	Child	Standard	NA	15 (94%)	1 (6%)	NA	0 (0)	16
Beal	Child	Exp. 2 Standard	NA	10 (50%)	10 (50%)	NA	0	20
ParkerRyan	Child	Control	NA	2 + 8 = 10 (.17 + .67 = .84)	2 (.17)	NA	---	12
Beal	Child	Modified	NA	8 (50%)	7 (44%)	NA	1 (6%)	16
Current	Child	Control	NA	17 (.81)	1 (.05)	NA	3 (14%)	21
Current	Child	Training	NA	11 (.50)	4 (.18)	NA	7 (.29)	22
ParkerRyan	Child	Practice	NA	4 + 2 = 6 (.33 + .17 = .50)	6 (.50)	NA	---	12

Yarmey1 = Yarmey, Yarmey, & Yarmey, (1994). This chart presents data from the adult witnesses who made an identification from a photographic lineup (not subjects in the voice conditions or the showup conditions). Yarmey and colleagues used two different confederates as targets in their research. As there were no significant differences in identification accuracy as a function of the different targets, scores were combined. Therefore, Yarmey and colleagues presented "mean proportion identification scores" (Yarmey et al., 1994, p. 458). Yarmey et al. reported that, of the subjects

who saw the photographic lineup, two subjects (2%) gave a Don't Know response and were excluded from analyses. Yarmey et al. had divided the incorrect identifications in the lineup absent condition into false identifications and foil identifications; in the chart above, both are presented and then the sum obtained by adding the two mean proportions together is presented.

Yarmey2 = Yarmey, Yarmey, & Yarmey (1996). Again, mean proportion identification scores were used by the authors, as no signficant differences were found as a function of the two target/confederates. Also, false identification proportions and foil identification proportions were presented separately by the authors and are reflected separately (and then as a sum) above.

ParkerRyan = Parker and Ryan (1993): The chart above presents their foil identifications and false identifications and a sum.

Vita

Dominique Huneycutt is a native of southeastern Virginia. During college, she studied for one term in what was then Leningrad in the former Soviet Union. She graduated from Dartmouth College in 1992 with a double major in Psychology with Honors and Russian Area studies. She then began graduate studies in the joint program in Law and Clinical Psychology at Villanova University School of Law and Hahnemann University (now Drexel University). She was a member of the Villanova Law Review (1994-1996) and a member of the team that won Villanova University School of Law's Negotiation Competition (1994) and Client Counseling Competition (1994). She earned her Master of Arts in Clinical Psychology from Hahnemann University in 1997.

In 1998 Dominique graduated from law school and was admitted to the Pennsylvania Bar. She served as a law clerk for the Family Court of Delaware from 1998-1999. She then continued her clinical training with additional practica experiences at the Division of Child Mental Health in Delaware. In 2002, Dominique completed her predoctoral internship at the Northwest Ohio Consortium in Toledo, Ohio. She continued as a Psychology Assistant at the Court Diagnostic and Treatment Center in Toledo prior to returning home to Virginia to spend time with her family and to complete this research project. Dominique has remained active in Dartmouth College's alumni organizations, including serving on the Executive Committee of the Dartmouth Club Officer's Association and on Dartmouth's Alumni Council. She is engaged to be married in July 2004.