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Children's Reinforcement-Induced Suggestibility: Its Developmental Trajectory and Relation to Individual Differences

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CHILDREN'S REINFORCEMENT-INDUCED SUGGESTIBILITY:
ITS DEVELOPMENTAL TRAJECTORY AND
RELATION TO INDIVIDUAL DIFFERENCES

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By

Elizabeth Rose Uhl

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For my parents, Chris and Barb Uhl –
who have worked hard to give me every opportunity for success.
Thank you for everything.

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ITS DEVELOPMENTAL TRAJECTORY AND
RELATION TO INDIVIDUAL DIFFERENCES

by

ELIZABETH ROSE UHL, M.A.

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Abstract

Research has shown that reinforcement by interviewers can lead children to make false allegations of wrong doing (e.g., Garven, Wood, & Malpass, 2000). The current study examined the developmental trajectory of reinforcement-induced suggestibility and its relation to individual differences among children. Forty-eight kindergarteners, 52 second graders, and 54 fourth graders viewed a science demonstration by a young man introduced as “Paco Perez.” One week later they were interviewed about the visit with misleading questions that suggested Paco had engaged in wrongdoing. Half of the children were interviewed using reinforcement; the other half did not receive reinforcement. Two weeks after Paco’s visit, children were re-interviewed and asked to give a free recall report of what he had done. Individual differences were assessed over both interview sessions. On average, reinforced children made false allegations in response to 48% of misleading questions during the first interview, compared to 8% of non-reinforced children. Kindergarteners made significantly more false allegations than second graders and fourth graders. However, the additive effect of reinforcement on false allegations did not differ among the three age groups. Among reinforced children, the tendency to make false allegations was negatively correlated with self-esteem. Among non-reinforced children, the tendency to make false allegations was negatively correlated with self-esteem and need for approval scores. Among reinforced children the frequency distribution of false allegations was bimodal and U-shaped, but among the non-reinforced children the distribution was unimodal and L-shaped. Overall, the results suggest that reinforcement-induced suggestibility involves different psychological processes than suggestibility induced by misleading questions.

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Children's Reinforcement-Induced Suggestibility:

Its Developmental Trajectory and Relation to Individual Differences

Dozens of daycare centers throughout the United States became the focus of sexual abuse investigations in the 1980s and 1990s. Claims of daycare abuse arose from El Paso, Texas to Dade County, Florida, and from the notorious McMartin Preschool case in Manhattan Beach, California to the highly publicized Kelly Michaels case in Maplewood, New Jersey. The children in these cases often told investigators of grotesque and brutal crimes that had been committed against them. They frequently made extreme allegations, including claims that they had been assaulted with weapons, transported from their schools in boats or airplanes, and videotaped or photographed while being abused. Though there was no physical evidence to support these claims, the children's testimony was often supported by reports from expert witnesses that the children exhibited symptoms of sexual abuse or by physicians who explained new medical procedures that provided evidence of the abuse (Nathan & Snedeker, 1995).

Children's reports of abuse in these daycare cases were generally believed despite the outrageousness of the claims because it was assumed that children could not make up such accounts on their own. Skeptics who questioned these accounts were regularly criticized or censured. Eventually, however, doubt began to grow and when these cases were examined more closely it became apparent that the reports did not originate from the children. The children in these daycare cases typically denied any abuse in initial interviews, and were supplied the details of their accounts through suggestive techniques used by the interviewers (Nathan & Snedeker, 1995). Scholars now generally agree that these cases were based on false allegations that were elicited from children using suggestive interviewing techniques (Wood, Nathan, Nezworski, & Uhl, 2009).

The McMartin and similar cases now lie more than twenty years in the past, and daycare abuse cases have apparently become rare (Wood et al., 2009). However, this has not meant the end of bizarre claims of ritual sexual abuse reported by young children after the employment of questionable interviewing techniques. For instance, a case currently underway in Tyler, Texas involves an alleged sex ring in which children were brought into a night club to dance and perform lewd acts for the entertainment of adults. The interviews in this case were highly suggestive, yet juries have sentenced four defendants to life imprisonment (Hall, 2009).

The daycare abuse cases that arose in the 1980s and 1990s stimulated extensive research on children's suggestibility (for reviews, see Blandon-Gitlin & Pezdek, 2009; Bruck & Ceci, 1995; Ceci & Bruck, 1993; Poole & Lamb, 1998; Wood et al., 2009). Researchers demonstrated that several techniques used by interviewers to elicit disclosures from children in the daycare cases can have a suggestive influence on children. These techniques include the use of anatomical dolls (see Ceci & Bruck, 1993; Dickinson, Poole, & Bruck, 2005), repeated questions (see Bruck & Ceci, 1995), exposure to misinformation (Poole & Lamb, 1998), and the use of focused questions (Blandon-Gitlin & Pezdek, 2009).

One interviewing technique that was wide-spread in the daycare cases of the 1980s involved the use of reinforcement. Schreiber et al. (2006) conducted a content analysis of a sample of interviews from the McMartin and Michaels cases and compared the techniques used in these cases with a comparison sample of Child Protective Services (CPS) interviews. These researchers found that reinforcement and several other suggestive techniques were used much more often by interviewers in the McMartin preschool and Kelly Michaels cases than by the CPS interviewers in the comparison sample.

Schreiber et al. (2006) distinguished between two kinds of reinforcement in child interviews: *Positive Consequences* and *Negative Consequences*. Positive Consequences is when an interviewer gives praise or other rewards to a child, or implies that the child will receive praise or rewards, by making statements that the interviewer approves of. Negative consequences, on the other hand, is when the interviewer criticizes or disagrees with the child for making a statement that does not meet the interviewer's expectations.

The following example of Positive Consequences is taken from an interview in the Tyler, Texas case cited earlier. In this example, the Interviewer (I), who is a Texas Ranger, indicates that the Child [C] can exhibit praiseworthy behavior by telling him what happened:

I = Interviewer C = Child

I: I don't want to tell you what I've been told because I don't want to put it in here (points to his brain).

C: Because you want to hear from me.

I: Yes ma'am. Very important. Very important. It would make me very happy. Do a cartwheel. Of course, you see that. So what else can you tell me?

(Interview of GS. Winter 2008.)¹

An example of Negative Consequences, taken from a McMartin interview, follows:

I = Interviewer C = Child

I: Heck, everybody was playing naked games in their school. Then they were just little kids, and they played, too, and some of the naked games were fun. The kids had a good time. And they were kind of silly. Do you remember that Bear [a puppet], some of those fun silly games?

C: [Shakes Bear puppet's head, "no".]

¹ Copies of this and other Tyler interviews are in the possession of James Wood, University of Texas at El Paso.

I: Oh, Bear, maybe you don't have a very good memory...

C: [Laughs]

I: ... and your memory must not be as good as Patsy's friend's memories...

(Interview Number 111, pp. 19-20)²

In a sample of 14 interview transcripts from the McMartin Preschool case, 20 transcripts from the Kelly Michaels case, and 20 CPS transcripts, Schreiber and colleagues (2006) found that the McMartin and Kelly Michaels interviewers used reinforcement much more frequently than did CPS interviewers. Specifically, the Positive Consequences technique was used in an average of 18% of exchanges between interviewers and children in the McMartin case versus 7% in the CPS cases. The Negative Consequences technique was used in an average of 15% of exchanges in the Kelly Michaels case compared to 4% in the CPS cases. Both differences were statistically significant ($p < .05$).

Schreiber et al. (2006) demonstrated that the interviews in the McMartin and Kelly Michaels cases were characterized by the use of reinforcement, and several experimental studies have demonstrated that reinforcement of this kind can quickly have a powerful influence on children's suggestibility. The first of these studies examined the impact of the McMartin and Michaels techniques in a sample of non-abused children (Garven, Wood, Malpass, & Shaw, 1998). The daycare centers of 66 children were visited by a young man introduced as "Manny Morales," who read the children a story. Children were questioned about Manny's visit one week later. Half of the children were questioned using Positive Consequences, Negative Consequences, and other suggestive techniques characteristic of the McMartin and Michaels cases. The other half of the children were questioned without using these techniques. Children

² Transcripts of the McMartin interviews are archived in the Department of Psychology, McGill University, Montreal, Quebec, Canada.

interviewed with Positive Consequences, Negative Consequences, and other suggestive techniques were much more likely to respond “yes” to suggestive questions (58%) than children in the comparison group (17%). Children who received suggestive techniques were also likely to acquiesce to suggestions within the first 1.5 minutes of the interview indicating that these techniques had a very quick and powerful influence on suggestibility.

In a study by Finnila, Mahlberg, Santtila, Sandnabba, and Niemi (2003, Study 2), children 4-5 and 7-8 years old were randomly assigned to receive a high social pressure interview, which included reinforcement and the other high pressure techniques used by Garven et al. (1998), or a low social pressure interview, which did not use these techniques. Children in the high social pressure condition were found to give significantly more suggestible responses than children in the low social pressure condition. Specifically, children in the high social pressure condition reported suggestible responses an average of 68% of the time, compared to 25% by children in the low social pressure condition. The results indicated that the high social pressure interview had a greater impact on children’s suggestibility than did individual differences in suggestibility as measured by the Bonn Test of Statement Suggestibility (BTSS).

The studies just cited by Garven et al. (1998) and Finnila et al. (2003) examined the effects of reinforcement in combination with other suggestive interviewing techniques. To isolate the specific effects of reinforcement, Garven, Wood, and Malpass (2000) examined the effects of Positive and Negative Consequences on children’s reports. In this study, children’s classrooms were visited by Paco Perez, who read the children a story. One week later, the children were interviewed about Paco’s visit. Each child was asked 16 questions: four leading questions about events that actually happened, eight questions about mundane events involving possible wrongdoing by Paco that did not happen (such as “Did Paco tear the book?”), and four

questions based on the McMartin Preschool case about fantastic events that did not happen (such as “Did Paco take you to a farm?”). A 2x2 design was employed in which reinforcement (received or not) was crossed with another suggestive interviewing technique. The researchers found a large and significant main effect for reinforcement – children who were reinforced answered “yes” to 35% of misleading questions about mundane events and 52% of misleading questions about fantastic events compared to children who were not reinforced, who answered “yes” to 13% of misleading mundane questions and 5% of misleading fantastic questions. Once again, the effect was obtained quickly – there was a substantial increase in suggestible responding for the reinforced children within the first two minutes of the interview compared to the non-reinforced children.

The children in the Garven et al. (2000) study were also resistant to challenges to their claims. In a second interview, one week after the first interview, children were again questioned about Paco Perez’s visit, but without any reinforcement. The researchers found that children who had received reinforcement previously, during the first interview, were substantially more likely to make allegations during the second interview than children who had not previously received reinforcement. Children who made allegations during the second interview were challenged by the interviewer, who asked if the event in question really happened or if the child just heard about it. Children who had received reinforcement the previous week were significantly more likely to claim having observed the event in question than children who had not received reinforcement.

A study by Billings, Taylor, Burns, Corey, Garven, and Wood (2006) examined the relation between reinforcement and children’s self-incrimination. Children were exposed to a fun toy in their classroom and were later told that the toy had been stolen. Children were then

questioned individually about the toy theft. The researchers found that children who received reinforcement for self-incriminating statements were significantly more likely to make such statements than children who were not reinforced. For example, reinforced children falsely reported having “guilty knowledge” of the theft in response to 52% of questions compared to 36% in the control condition and reinforced children falsely admitted having witnessed the theft in response to an average of 30% of questions, compared to 10% by children in the control condition. The impact of reinforcement again operated quickly. Many children made self-incriminating statements after only a few minutes of questioning.

Reinforcement-Induced Suggestibility: Unresolved Issues

As research has shown, reinforcement can have a powerful and swift impact on children’s reports. However, many issues concerning reinforcement-induced suggestibility have yet to be explored. The present study addresses several of these issues.

The first unexplored issue concerns the developmental trajectory of reinforcement-induced suggestibility. Specifically, does the suggestive influence of reinforcement change as children grow older? A second unexplored question concerns whether there are individual differences that make some children more susceptible than others to reinforcement-induced suggestibility. A third unresolved question concerns the cognitive mechanism by which reinforcement-induced suggestibility operates. Specifically, does reinforcement actually change children’s memories, or instead does it mainly impact children’s verbal reports while leaving their memories unchanged? These three issues will be addressed individually in the following sections.

Developmental Trajectory

Recent unpublished research indicates that reinforcement-induced suggestibility in children has a bimodal, U-shaped distribution (see Figure 1). In a study by Camilletti, Uhl, Scullin, and Wood (2010) that used reinforcement to elicit false statements from kindergarteners and first graders, reinforced children were found to respond in two very different ways: approximately half of the children acquiesced to all or nearly all misleading questions, while one third resisted all suggestions. Very few reinforced children fell in between these two extremes. This difference was most striking when children were questioned about fantastic events. Fifteen children said “no” to all misleading fantastic questions, fifteen children said “yes” to all misleading fantastic questions, and only four children said “yes” to some misleading fantastic questions and “no” to others (see Figure 2).

The current project seeks to understand factors that might account for this strikingly bimodal aspect of reinforcement-induced suggestibility, which has not been previously noted in the scientific literature. Have the non-suggestible children passed a developmental milestone that renders them resistant to reinforcement by an interviewer? Or instead, do more enduring individual differences in personality or cognition account for the suggestibility of some children but not others?

Previous research examining the effect of reinforcement on suggestibility has focused on preschoolers, kindergarteners, and first graders (Camilletti et al., 2010; Garven, Wood, & Malpass, 2000; Garven, Wood, Malpass, & Shaw, 1998). The current study seeks to understand better the developmental trajectory of reinforcement-induced suggestibility by comparing kindergarteners, second graders, and fourth graders. It is important to address this question because there is reason to believe that all forms of suggestibility may not follow the same

developmental trajectory. Researchers have found that, when questioned about their experiences, children generally report less information and make more errors than adults, and that older children tend to be more accurate than younger children (see Sutherland & Hayne, 2001). In addition, there has been a general consensus that younger children are more suggestible than older children (Bruck & Ceci, 1995). However, findings reported by Scullin and Ceci (2001) did not conform to this pattern. These researchers measured children's shift, yield, and total suggestibility scores on the Video Suggestibility Scale for Children (VSSC). Yield is the tendency for a child to acquiesce to an interviewer's suggestion. Shift is the tendency for the child to change his or her answer in response to negative feedback. Scullin and Ceci found that four year olds had higher shift suggestibility scores, not lower, than three year olds, contradicting the common simplified view that suggestibility uniformly decreases with age. No such age trend emerged for yield or total suggestibility. This finding suggests that developmental changes in suggestibility may not always be as straightforward or simple as is commonly assumed.

On the one hand, the bimodal distribution of reinforcement-induced suggestibility found by Camilletti et al. (2010) is consistent with the hypothesis that children who have passed a particular developmental milestone are substantially less susceptible to such suggestibility than children who have not passed the milestone. If this hypothesis is correct, then the reinforcement-induced suggestibility observed in half of the kindergarteners would be expected to decrease with age and possibly be absent in the oldest children in the present study (fourth graders). Thus, if reinforcement-induced suggestibility is absent among older children, this would suggest that the reinforcement effect may be related to an aspect of development that is not present in all kindergarteners.

On the other hand, if reinforcement-induced suggestibility is still present in older children, this may suggest that a stable individual difference characteristic may be responsible. Some individual differences are the result of differences in reaching certain developmental milestones and therefore expected to change once a cognitive ability has come on-line for a young child (such as theory of mind), whereas other individual differences, such as intelligence, are expected to be more consistent throughout life.

Individual Differences

In addition to examining the developmental trajectory of the reinforcement effect, the current study will also examine individual characteristics of children that may be related to reinforcement-induced suggestibility, including verbal proficiency (as measured by receptive vocabulary knowledge), ability to delay gratification, executive function, working memory, self-esteem, and the tendency to give socially desirable responses.

Receptive vocabulary. In a review of the literature on individual differences in suggestibility, Bruck and Melnyk (2004) found that several studies showed that preschoolers with more advanced language skills tended to be less suggestible than children with less advanced language skills when a comprehensive set of language measures was used. Since this review, Clarke-Stewart, Malloy, and Allhusen (2004) found that children with advanced verbal abilities were less suggestive in a socially pressured interview. In addition, Kulkofsky and Klemfuss (2008) found that language ability was negatively related to false assents in a highly suggestive interview that involved several social pressure techniques. Bruck and Melnyk did not find a relation between vocabulary knowledge alone and suggestibility in the several studies that examined this relation. However, Camilletti et al. (2010) found a significant negative correlation ($r = -0.39$) between reinforcement-induced suggestibility and receptive vocabulary level as

measured by the Peabody Picture Vocabulary Test-4. Additionally, a later study by Camilletti (2010) found a significant relation between vocabulary and suggestibility in both low-social pressure and high-social pressure conditions.

Delayed gratification. Delayed gratification is the ability to postpone immediate rewards for greater, delayed rewards (Mischel, Shoda, & Rodriguez, 1989). Because reinforcement from an interviewer is a form of reward, children who are better able to delay gratification may also be less likely to acquiesce to interviewer reinforcement during a suggestive interview. Few studies have examined the relation between ability to delay gratification and suggestibility. In a study by Scullin and Ornelas (2009), an experimenter wrapped a gift for a child after first asking the child not to peek. Children were also administered the Video Suggestibility Scale for Children – Spanish Language (VSSC-S). One of the scores for this test, “Yield,” measured the tendency of a child to acquiesce to the interviewer’s suggestion. Scullin and Ornelas found that children who peeked more during the gift wrapping were more likely to score high on the “Yield” scale of the VSSC-S.

Executive function – inhibitory control. Bruck and Melnyk’s (2004) review of the literature on executive function and suggestibility yielded mixed findings – some studies found significant relations and other did not and there was no consistency for type of executive function task for which effects were found. In subsequent research, Clarke-Stewart et al. (2004) found that children’s scores on three measures related to adaptive inhibitory control were related to suggestibility. Children with higher adaptive inhibitory scores were less suggestible. In addition, Roberts and Powell (2005) found that children with higher scores on a retroactive verbal measure of inhibitory control were less suggestible than children who scored poorly on this measure.

Working memory. Working memory is a component of executive function (Brocki & Bohlin, 2004). The research examining the relation between traditional memory tests and suggestibility have typically found no relation, although a few studies have found a relationship (see Bruck & Melnyk, 2004, for a review). Recently, Scullin and Ornelas (2009) found that working memory was related to shift scores among the older children in their preschool sample.

Self-esteem. In a review of research on individual differences in suggestibility, Bruck and Melnyk (2004) found that high self-efficacy or self-concept was related to lower suggestibility in several studies. Included in this sample were studies that measured self-esteem. Self-esteem is one's judgment of one's own worth (Kail, 2001). Gudjonsson and Sigurdsson (2003) found that low self-esteem in an adult sample was a good predictor of scores on the Gudjonsson Compliance Scale. Vrij and Bush (2000) found that younger children were more suggestible than older children, but the age difference was not statistically significant when self-confidence was controlled for. Howie and Dowd (1996) found that fourth graders with higher self-esteem were less suggestible. However, Chae and Ceci (2005) found a positive correlation between self-perceptions and suggestibility.

Socially desirable responding. Crown and Marlowe (1964) observed that there are individual differences in the tendency of individuals to describe themselves in overly favorable terms on personality tests. These researchers argued that such socially desirable responding reflects a need for approval from others, and this need leads individuals to over-report culturally approved behaviors on personality tests. The Marlowe-Crown Social Desirability scale was created as an indirect measure of Need for Approval (Crown & Marlowe, 1964). This measure and other similar scales have been adopted for use with children.

In one particularly relevant study of the Need for Approval, Ford and Rubin (1970) asked preschoolers to drop a marble into one of two holes in a board. After a baseline period, children were reinforced for dropping the marble into the hole that was used least frequently during the baseline period. Children who scored high in social desirability changed their behavior more in response to the reinforcement than children who scored low in social desirability. This finding suggests that children who are high in social desirability and have a stronger Need for Approval may be more susceptible to reinforcement from an interviewer than children who are low in socially desirable responding.

False Memories or False Reports?

Garven et al. (2000) found that if children made false allegations in response to reinforcement and were later challenged by an interviewer, they claimed to have observed 25% of mundane events and 30% of fantastic events. This finding raises a question whether the children were merely repeating the interviewer's suggestions or if they had developed false memories of the events in question.

Although it is difficult to differentiate between false memories and false reports in suggestibility studies several researchers have attempted to do so. In a study in which false memories of an event were implanted in adult subjects, Lindsay, Hagen, Wade, and Garry (2004) coded memory reports to determine if the participants reported (a) no images or memories of the event, (b) images but no memories of the event, or (c) memories of the false event. A report was considered a memory if the subject appeared to believe that he or she was remembering the event.

Otgaar, Candel, Merckelbach, and Wade (2009) adopted this same procedure in a study of children's reports of false events. If children reported only the details mentioned by the

interviewer, the report was classified as containing images but not memories. A report was classified as a false memory only if it included details beyond those mentioned by the experimenter and if the child indicated remembering the event. Though this classification system may not perfectly distinguish between false memories and false reports, it appears to provide a way to begin distinguishing the two.

The Current Study

The current study addresses several of the issues set forth in the previous sections. Children in kindergarten, second grade, and fourth grade were visited in their schools by a young man introduced as “Paco Perez” who performed a science demonstration. One week later, children were interviewed about this visit. Half of the children were reinforced for providing “yes” answers in response to misleading questions from the interviewer that suggested that Paco had engaged in wrongdoing. The other children were asked the same suggestive questions but did not receive reinforcement. One week later, children were interviewed a second time and asked to provide a free recall report of the classroom visit. In addition, children were also given a series of tests to measure their individual differences in respect to receptive vocabulary knowledge, self-esteem, ability to delay gratification, and tendency toward socially desirable responding.

The present study examined three hypotheses concerning the developmental trajectory of the reinforcement effect, as measured by suggestibility during the first interview. First, a main effect for reinforcement was anticipated, such that children who were reinforced would be more suggestible in the first interview than children who were not reinforced. Second, a main effect for age was expected, such that younger children would generally be more suggestible than older children in the first interview. Last, an interaction between reinforcement and age was expected – specifically, reinforcement was expected to have a greater impact on younger children’s accuracy during the first interview than on older children’s accuracy.

The study also tested six hypotheses concerning individual differences in suggestibility. First, children with better receptive vocabulary were expected to be less suggestible than other children during the first interview. Second, children who were better able to delay gratification

were expected to be less suggestible. Third, children with higher self-esteem were expected to be less suggestible. Fourth, children who have higher need for approval were expected to be more suggestible. Fifth, children with better working memory were expected to be less suggestible. Sixth, children with better inhibitory control were expected to be less suggestible.

The study also tested three hypotheses concerning the effect of reinforcement on the development of false memories, as measured by the free-recall task at the second interview. First, children who were reinforced were expected to be more likely to report false memories than children who were not reinforced. Second, younger children were expected to be more likely to report false memories than older children. Last, an interaction between reinforcement and age was expected. Specifically, reinforcement was expected to have a greater impact on false memory reports in young children than in older children.

Method

Participants

One hundred fifty-four students were recruited for the study from schools in a medium-sized city in the U.S. Southwest, including 48 kindergarteners, 52 second graders, and 54 fourth graders. Overall, the age range was 60 to 125 months with an average age of 95.14 months ($SD = 19.18$, or 7.92 years) and 61% of the sample was female. The average age for kindergarteners in the study was 70.83 months ($SD = 4.89$, or 5.9 years) and 56.3% of kindergarteners were female. The average age of second graders was 95.27 months ($SD = 4.06$, or 7.94 years) and 51.9% of second-graders were female. The average age of fourth graders was 116.63 months ($SD = 4.41$, or 9.72 years) and 74.1% of fourth graders were female. Race/ethnicity was not reported for 52 children. For the 102 children for whom race/ethnicity was reported, 69.6% were identified as Hispanic, 4.9% as non-Hispanic White, and 25.5% indicated other ethnicities. An informed consent form was sent home with each child on which parents consented to their child's participation in the study and the child could assent to participate (see Appendix A). Data were collected from an additional seven children but not included in the following analyses for one of the following reasons: the child missed or did not complete one of the interview sessions, the child would only respond if interviewed in Spanish, the child was not present for the Paco visit, or the child decided not to participate.

Materials

Paco Perez Interview One. Interview One included 16 yes/no questions about Paco's visit. These questions, which were the same as those used by Garven et al. (2000), included four leading correct questions about events that the child actually witnessed, eight misleading questions about mundane events, and four misleading questions about fantastic events that did

not occur, such as being flown away in a helicopter. The mundane misleading questions asked about wrongdoing by Paco (e.g., tearing a book) or actions that might be misinterpreted as improper or sexual (e.g., kissing the child). The fantastic misleading questions were based on bizarre allegations made by children in the McMartin Preschool case.

In the Suggestive Control condition the interview included the same misleading questions but without reinforcement (see Appendix B). In the Reinforcement Plus Suggestion condition the interview included misleading questions and reinforcement (see Appendix C). Reinforcement included praising the child (e.g., “Good Job!”) for “yes” responses and expressing disappointment and repeating the question (e.g., Are you sure? I was hoping you would remember.) for “no” responses.

Digit Span Task . For the Digit Span Task, children were asked to repeat back a series of numbers read by the interviewer. There were 10 trials, each with one more number than the previous trial. The first trial had 2 numbers and the last trial had 11 numbers. Children were given an opportunity to repeat the numbers back. If the child correctly repeated the numbers, the interviewer moved on to the next level. If the child did not correctly repeat the numbers, the child was given another set of numbers at the same level. Once a child missed both sets at a certain level, the task ended (see Appendix D). Scullin and Ornelas (2009) found that performance on the digit span task described above was strongly and negatively correlated with a measure of yield suggestibility. The Digit Span Task is used as a quick and easy-to-administer measure of working memory.

Young Children’s Social Desirability Scale (YCSD). Ford and Rubin (1970) developed this 26-item forced-choice scale to measure children’s tendency to describe themselves in a socially desirable way for preschool children (see Appendix E). For each item,

the child is presented with two statements that are opposite and asked to choose the one that best describes him or her. The forced-choice format eliminates any tendency to respond with a yes-bias. Scores on this measure were found to have internal consistency (odd-even reliability) between .63 and .87 for four and five year olds. The test-retest reliability over a 5-week period was 0.58 in a subset of 46 children. It appears that the test-retest reliability is better for four and five year olds than for three year olds, but this analysis could not be broken down by age due to small sample size.

Children's Gambling Task (CGT). Children also completed the Children's Gambling Task (Kerr & Zelazo, 2004), which is a version of the Iowa Gambling Task simplified for use with children. The CGT ascertained children's ability to make advantageous or disadvantageous choices over the course of the task. The CGT was developed as a measure of emotional decision-making, that is, decision-making about events that have meaningful rewards or losses. Children were presented with two decks of card. Each card has happy and/or sad faces on the other side. For each happy face the child received a small treat and for each sad face the child lost a treat. The advantageous deck had low risks and low rewards. If the child chose from this deck consistently, he or she netted a gain in treats. The disadvantageous deck had high risks and high rewards. If the child consistently chose from the disadvantageous deck, he or she netted a loss in treats. This task was included because of similarities with the reinforcement interview included in the study. That is, children had to choose between a deck that presented greater immediate rewards that also carried some risk (such as saying "yes" to receive immediate praise) and a deck that had lower immediate rewards but was actually advantageous in the long run. Though this task shares several features with Delay of Gratification tasks, such as requiring the consideration of future consequences, one study that examined children's ability to delay

gratification and their performance on the CGT found a negative correlation between the two measures (Hongwanishkul, Happaney, Lee, & Zelazo, 2005). Kerr and Zelazo (2004) reported that four year olds made more advantageous choices on the CGT than three year olds.

Culture Free Self-Esteem Inventories, 3rd Edition (CFSEI-3). The original version of this measure was designed by Battle (1981) to measure self-esteem in children and adults (Chiu, 1988). The current version was introduced in 2002. It includes a series of yes/no questions that can be administered orally or in writing in 15 to 20 minutes and is appropriate for six year olds to 18 year olds. There are almost no peer-reviewed studies on the reliability and validity of the latest edition of the CFSEI-3. However, research on the original edition found that it had adequate reliability and validity. For example, Kozeluk and Kawash (1990) found high agreement between scores on the CFSEI and another self-esteem inventory, the Coopersmith Self-Esteem Inventories.

The CFSEI-3 was reviewed in *The Fifteenth Mental Measurements Yearbook* (2003). Garcia (2003) reported that the CFSEI-3 had acceptable internal consistency (greater than .81 for the primary and intermediate forms), and satisfactory test-retest reliability (.72 for the Primary form and .86 for the Intermediate form). Garcia also reported evidence of adequate item discrimination and minimal gender or ethnicity bias. Scores on the CFSEI-3 were also found to be highly correlated with three other measures of self-esteem. Garcia concluded that the CFSEI-3 is suited for use in research studies examining self-esteem.

Since the CFSEI has not been normed for five year olds, the data for this study were normed based on the local data collected. For each grade, the mean and standard deviation of the raw scores on the CFSEI were calculated. For the children in kindergarten and second grade, who answered the 29 questions on the Primary form of the CFSEI, their raw scores were based

on their yes or no answers to these questions. For children in the fourth grade, who answered questions on the Intermediate form of the CFSEI, their raw scores were based on the sum of four of the subscales, the Academic, General, Parental/Home, and Social subscales. Scores within each age group were then standardized to have a mean of 100 and a standard deviation of 15.

Paco Perez Free Recall Interview (Interview Two). Interview Two included 11 questions (see Appendix F). It started with three rapport building questions. The interview also contained one yes/no question about the Paco Perez visit followed by seven open-ended questions about the visit. The first two of these questions were broad while the last five questions were tailored toward specific aspects of Paco's visit.

Children's Social Desirability Questionnaire (CSD). Crandall, Crandall, and Katkovsky (1965) adapted the Crowne and Marlow Scale of Social Desirability for use with third through twelfth graders. The CSD, a 48-item yes/no questionnaire designed to assess socially desirable responding (see Appendix G), has been demonstrated to have high split-half reliability ($r = 0.82$ and 0.95 for boys and girls, respectively) and test-retest reliability ($r = 0.90$, Crandall et al. 1965). Lee (2004) found that scores on the CSD were positively correlated with acquiescence in response to leading questions, and with suggestibility in response to negative feedback, as measured by the Yield and Shift scales, respectively, of the Gudjonsson Suggestibility Scale.

Knock-Tap. The Knock-Tap is a measure of inhibitory control from the NEPSY: A Developmental Neuropsychological Assessment (Korkman, Kirk, & Kemp, 1998). The Knock-Tap is appropriate for 5 to 12 year olds and it consists of two 15 trial sets. In the first set, the child is shown the rules, which are to *knock* when the interviewer *taps* and to *tap* when the interviewer *knocks*. In the second set of 15 trials, the rules are made more complicated – the child is asked to *sidefist* when the interviewer *knocks*, *knock* when the interviewer *sidefists* and

do nothing when the interviewer *taps*. The child is taught the new rules and given up to three opportunities to practice the rules before eat set begins. Molfese, Molfese, Molfese, Rudasill, Armstrong, and Starkey (2010) found that scores on the Knock-Tap were consistent with scores on another measure of inhibitory control and concluded that the Knock-Tap is a simple and valid way to assess executive function.

Peabody Picture Vocabulary Test, Fourth Edition (PPVT-4). The PPVT measures an individual's receptive vocabulary knowledge. Individuals are read a word and asked to indicate which of four pictures represents that word. This test has been normed for individuals as young as two and as old as 90. Data were collected from over 3,500 individuals to norm the fourth edition of this test (Dunn & Dunn, 2007). The PPVT-4 has been shown to have split-half reliability and test-retest reliability above 0.90 for all age groups. Performance on the PPVT-4 has also been shown to be highly correlated with performance on other vocabulary tests, such as the Expressive Vocabulary Test and the PPVT-III (Dunn & Dunn, 2007).

Gift Wrap Task. To measure a child's ability to delay gratification, children in this study completed the Gift Wrap Task used by McCabe and Brooks-Gunn (2007) and more recently by Scullin and Ornelas (2009). Children are told that the experimenter has a gift for the child but that the gift has not been wrapped yet. The child is asked to turn around so that the experimenter can wrap the gift. The experimenter takes one minute to wrap the gift (as timed with a stop watch) and records the number of times the child tries to peek at the gift.

Validity research on the Gift Wrap Task is limited but promising. As already described, Scullin and Ornelas (2009) found that performance on the Gift Wrap Task correlated with Yield scores on the VSSC-S. Kochanska, Murray, Jacques, Koenig, and Vandegeest (1996) reported

that performance on the Gift Delay task was related to other measures in a battery of inhibitory control tasks.

Procedure

Session One. On the first day, children's schools were visited by Paco Perez, a research assistant who performed a science demonstration for the class. Paco wore a funny hat when he was introduced to the class and switched to funny glasses while he performed the demonstration. The demonstration was appropriate for all three age groups. Last, Paco put a sticker on each child's hand.

Session Two. One week after Paco's visit, children in the study were interviewed individually about his visit. First, children were asked the 16 questions about the visit from the Paco Perez Interview One, including misleading questions about possible wrongdoing or improper actions by Paco (Appendices B and C). The children in the Suggestive Control condition were interviewed using misleading questions without reinforcement. The children in the Reinforcement Plus Suggestion condition were interviewed using misleading questions and were reinforced for assenting to questions that implied wrongdoing by Paco. The Paco Perez interview was videotaped. After the Paco Interview, children were administered the Digit Span Task, the Young Children's Social Desirability Scale, the Children's Gambling Task, and the Culture-Free Self-Esteem Inventory.

Session Three. One week after the first interview, children were individually interviewed by a different interviewer about Paco's visit and asked to provide a free recall report of the classroom visit (Appendix E). This interview was videotaped. During this session after the Paco Free Recall interview, the Children's Social Desirability Questionnaire, the Knock-Tap,

the Peabody Picture Vocabulary Test - 4, and the Gift Wrap Task were administered. The Gift Wrap Task was also videotaped.

Data Coding

Interview One. Children's yes and no responses to the questions in Interview One were recorded by the interviewer while the interview was being conducted. Total suggestibility was calculated by counting the number of yes responses to misleading questions during the first interview and then dividing the number of yes responses by 12, the total number of misleading questions.

Gift Delay Task. Children's behavior during the gift delay task was videotaped so that it could be coded for behaviors identified by Kochanska et al. (1996). The child's peeking behavior was coded for if the child turned around to peek, looked over their shoulder to peek, or did not peek at all. Children received a score of "0" if they did not attempt to peek, a "1" if they peeked over their shoulder, and a "2" if they turned around to watch (Scullin & Ornelas, 2009).

Paco Free Recall. Each free recall report provided during the second Paco interview was independently coded by two coders to determine if children incorporated false suggestions from Interview One or other false reports in their free recall interview. Coders were unaware of the experimental condition to which each child was assigned. Out of the 134 children for whom video recordings of Interview Two were available, eight incorporated suggestions for Interview One into their free recall reports and 21 included other false reports into their free recall reports. Inter-rater reliability was high for the number of false suggestions incorporated into the free recall report ($Kappa = 1.00, p < .001$) and for the presence of other false reports ($Kappa = .86, p < .001$). There were five cases on which the coders disagreed about the presence of false reports. After coding the first 50 cases, the coders met and discussed their disagreements. This

discussion informed future coding and once the coding was complete the authors again met to discuss disagreement. For the five cases in which there was disagreement, the coders came to an agreement about how the case should be coded and this was used in determining the frequency of false reports. Since there were so few false reports, these reports were not coded using the criteria used by Lindsay et al. (2004) and Otgaar et al. (2009) for examining false memories.

Word Count. In addition to examining false reports, Raw Word Count (RWC) (Dickinson & Poole, 2000) was derived from the children's free-recall interview. Dickinson and Poole found RWC to be highly correlated with coding for Syntactic Units and Modified Word Count, but much easier and less time consuming. After the interviews were transcribed, interviewer comments were deleted and children's answer to two questions ("Tell me more about..." and "Do you remember when Paco Perez visited your school?") were deleted so that the RWC represents responses to a uniform set of questions across children. Since changes were made to the Free Recall Interview after data collection began, responses to any questions that were later removed from the Free Recall Interview were also removed. Any clarification questions the child asked were also removed so that only the words used once the child began to answer the question were counted. The RWC for each interview was coded twice; overall, there was high agreement between raters with an $ICC = .97, p < .001$. In cases in which there was disagreement, the average of the two ratings was taken.

Results

Preliminary Analyses

Children from 20 classrooms participated in this experiment. Multivariate Analyses of Variance (MANOVAs) were carried out to determine if there were any between-classroom effects, other than those that were due to differences in children's grade level. Within each grade group a MANOVA was conducted with classroom as the independent variable, and with the following dependent variables: scores for total suggestibility, interview type, Digit Span Task, Children's Gambling Task, Knock-Tap, PPVT, Gift Wrap Task, Children's Social Desirability Scale, the Young Children's Social Desirability Scale, and Culture Free Self-Esteem Inventory. Classroom was not a significant predictor for kindergarteners (Wilks' $\lambda = 0.07$, $p = .19$), second graders (Wilks' $\lambda = 0.26$, $p = .31$), or fourth graders (Wilks' $\lambda = 0.22$, $p = .21$). Therefore, all subsequent analyses were collapsed over classrooms.

A similar MANOVA was conducted with the same dependent variables and gender as the independent variable. Gender was dummy coded with "0" representing male and "1" representing female. Gender was not a significant predictor, Wilks' $\lambda = 0.98$, $p = .99$. Therefore, all analyses were collapsed across gender.

Last, a MANOVA was conducted with the same dependent variables and delay between Paco visit and Interview One as the independent variable. Due to scheduling difficulties caused by unusual weather conditions and school closures, the length of delay between the Paco Visit and Interview One ranged from 6 to 21 days ($M = 9.37$, $SD = 3.59$, median = 8.00). Overall, the majority of children were interviewed in the week after the first Paco visit: 6-10 days (the week after, if the Paco visit was on a Tuesday, which most were): 80.6%, 11-15 days: 14.2%, 20-21

days: 5.2%. Length of delay was not found to be a significant predictor, Wilks' $\lambda = 0.42$, $p = .21$. Therefore, all analyses were collapsed across delay.

The Developmental Trajectory of Suggestibility

The dependent variable for the central analyses of the study was total suggestibility, that is, the proportion of “yes” answers given by a child to all mundane and fantastic misleading questions. A 2 x 3 Analysis of Variance (ANOVA) was conducted with interview type and grade as independent variables and total suggestibility as the dependent variable to examine the main effects and interaction of interview type and grade (see Table 1). There was a main effect of interview type, $F(1, 148) = 76.59$, $p < .001$, $\eta^2 = 0.34$, such that children in the Reinforcement Plus Suggestion condition ($M = 0.48$, $SD = 0.39$) were six times more likely to assent to misleading questions than children in the Suggestive Control condition ($M = 0.08$, $SD = 0.14$).

There was also a main effect of grade, $F(2, 148) = 4.08$, $p = 0.02$, $\eta^2 = .05$. Post-hoc analyses revealed that the main effect for grade was largely driven by the difference between kindergarteners and other children. Kindergarteners ($M = .36$, $SD = .38$) were significantly more likely to be suggestible than second graders ($M = .24$, $SD = .36$, LSD mean difference = 0.12, $p = .04$) and fourth graders ($M = .23$, $SD = .31$, LSD mean difference = 0.13, $p = 0.03$). However, the difference between second and fourth graders was not significant (LSD mean difference = 0.01, $p = 0.92$). Overall, kindergarteners said yes to 36% of misleading questions, on average, compared to 24% of questions that second graders acquiesced to, and the 23% than fourth graders acquiesced to (see Figure 3).

Contrary to the hypothesis, there was not a significant interaction between interview type and grade, $F(2, 147) = 0.28$, $p = 0.75$. That is, the additive effect of reinforcement on top of asking suggestive questions did not differ across age groups. On average, children in the

Reinforcement Plus Suggestion condition said yes to an average of 40% more misleading questions than children in the Suggestive Control condition. Kindergarteners in the Reinforcement Plus Suggestion condition said yes to 45% more misleading questions than kindergarteners in the Suggestive Control condition. Second graders in the Reinforcement Plus Suggestion condition said yes to 41% more misleading questions than second graders in the Suggestive Control condition. Fourth graders in the Reinforcement Plus Suggestion Condition said yes to 37% more misleading questions than fourth graders in the Suggestive Control condition (see Figure 4).

Last, the distribution of the number of misleading questions that children said “yes” to was also examined. The U-shaped, bimodal distribution found by Camilletti et al. (2010) was replicated in the Reinforcement Plus Suggestion condition (see Figure 5). In contrast, the distribution for children in the Suggestive Control condition had a unimodal, L-shape with scores clustered around the floor at 0 or 1 yes answers (see Figure 6).

Individual Differences

Across interview groups, grade was significantly and negatively correlated with scores on CSD, YCSD, and the Gift Wrap task. Grade was significantly and positively correlated with scores on the Digit Span Task, and Raw Word Count. The correlations of grade with gender and total suggestibility were marginally significant. Grade was not related to CFSEI scores, PPVT scores, or CGT scores (see Table 2 for all grade correlations).

The correlations of suggestibility with CFSEI, Young Children’s Social Desirability Scale, the Children’s Social Desirability Scale, gender, Digit Span Task, Children’s Gambling Task, Knock-Tap, the Gift Wrap Task, Raw Word Count, and PPVT scores were examined separately for each of the two interview conditions. Because grade was related to performance

on many variables, including total suggestibility, partial correlations (pr) of the individual difference measures with total suggestibility were computed controlling for the effect of grade. For children in the Reinforcement Plus Suggestion condition, the only variable that was significantly related to total suggestibility was self-esteem, as measured by the CFSEI, $pr = -.33$, $p < .01$, (see Table 3 for the complete table of partial correlations). For children in the Suggestive Control condition, CSD scores, $pr = -.28$, $p < .05$ were significantly correlated with total suggestibility (see Table 4 for the complete table of partial correlations). Importantly, gender was not significantly related to total suggestibility for the Reinforcement Plus Suggestion group ($pr = .12$, $p = .31$) or for the Suggestive Control group ($pr = -.03$, $p = .81$).

Hierarchical multiple regressions were conducted to examine the relation between the individual difference variables and total suggestibility for each interview condition further. For each interview condition, a hierarchical regression was conducted with grade entered as a predictor in the first step and CFSEI, PPVT, and CSD scores entered in the second step. For children in the Reinforcement Plus Suggestion Condition, only the second step in the hierarchical regression was significant, $R^2 = .16$, $p = .03$, $\Delta R^2 = .12$, $F(3, 66) = 3.14$, $p = .03$. CFSEI scores were the only significant predictor of total suggestibility in this group, standardized $\beta = -.30$, $p = .03$, although the regression coefficient for grade approached statistical significance, standardized $\beta = -.21$, $p = .07$ (see Table 5).

For children in the Suggestive Control condition the first step was significant, $R^2 = .09$, $F(1, 70) = 6.41$, $p = .01$. Grade was a significant predictor in this step, standardized $\beta = -.29$, $p = .01$. The second step was also significant, $R^2 = .21$, $F(4, 70) = 4.45$, $p < .01$, $\Delta R^2 = .13$, $F(3, 66) = 3.58$, $p = .02$. In the second step, grade (standardized $\beta = -.32$, $p < .01$) was a significant

predictor of total suggestibility and PPVT (standardized $\beta = -.22, p = .06$) and CSD (standardized $\beta = -.24, p = .07$) were marginally significant (see Table 6).

To increase power for these analyses, another regression was conducted with all data. In this regression, interview type, grade, centered CFSEI, PPVT, and CSD scores, and the interactions of interview type with centered CFSEI, PPVT, and CSD scores were entered as predictors with total suggestibility as the dependent variable (see Table 7). The regression was significant, $F(8, 133) = 12.83, p < .001$, grade and condition were both significant predictors as was the interaction between condition and CFSEI scores. The significant interaction bolsters the findings of the previous regressions, that CFSEI scores predict suggestibility in the Reinforcement Plus Suggestion condition but not the Suggestive Control condition.

False Memories During Free Recall

Video recordings of Interview 2 were available for 134 children. These recordings were transcribed and coded for the presence of false reports about Paco Perez during free recall. Overall, eight children incorporated suggestions from Interview One into their free recall report and 21 children included other false reports about what Paco Perez did (see Table 8).

Since there were few false reports overall, children were categorized as either having made a false report or not. A Chi Square analysis revealed that children in the Reinforcement Plus Suggestion condition were more likely to make false reports than children in the Suggestive Control condition, $\chi^2(1) = 11.56, p = .001$. The Chi Square analysis for grade was also significant, $\chi^2(2) = 10.60, p = .005$. Post hoc Chi Square analyses revealed that kindergarteners made significantly more false reports than second-graders, $\chi^2(1) = 6.61, p = .01$, and fourth-graders, $\chi^2(1) = 7.42, p = .006$. There was not a significant difference between second-graders and fourth-graders, $\chi^2(1) = .01, p = .91$. As can be seen, between-group differences that were

significant in Interview One when children were questioned suggestively were also significant in Interview Two when children gave free recall reports.

The children who incorporated suggestions from the first interview into their free recall reports included accusations of saying a bad word and throwing a crayon at a kid. Though some of the other false reports against Paco were innocuous – such as playing outside with the child or “He smelled flowers,” (Child 305) others were not, such as “He punched me in the stomach and then he made me throw-up on him,” (Child 307). There was also one child who appeared to be talking about another classroom visitor “...made us eat carrots” (Child 2015).

Exploratory Analyses

In exploratory analyses, the effect of age and type of interview was also examined separately for mundane and fantastic questions (see Table 9 and Table 10 for means). The pattern of results was the same as it was for total suggestibility. For both types of questions, children in the Reinforcement Plus Suggestion condition were more likely to be suggestible than children in the Suggestive Control condition (Mundane, $F(1, 148) = 82.54, p < .001, \eta^2 = .36$, Fantastic, $F(1, 148) = 49.35, p < .001, \eta^2 = .25$). Also, younger children tended to be more suggestible than older children (Mundane, $F(2, 148) = 3.28, p = .04, \eta^2 = .04$, Fantastic, $F(2, 148) = 4.4, p = .01, \eta^2 = .06$).

The correlations between individual difference predictors were also examined. The individual difference measures can be broken down into three basic groups: (a) Self-Esteem and Socially Desirable Responding, (b) Vocabulary, and (c) Executive Function measures. The self-esteem and socially desirability measure were grouped together because of similarity in some of the items included in these measures. As already noted, grade was significantly related to scores on CSD, YCSD, the Digit Span task, the Gift Delay task, and Raw Word Count (see Table 2).

Gender was not significantly related to any individual difference predictors when grade was controlled for (see Table 11).

The three measures of self-esteem and social desirability were significantly correlated with each other, even when grade was controlled for. Additionally, CFSEI scores and scores on the CSD were significantly correlated with performance on the Digit Span task. CFSEI scores were also significantly correlated with PPVT scores.

PPVT scores were significantly related to CFSEI scores, performance on the digit span task, and raw word count. Interestingly, the four measures of executive function – the Digit Span task, the CGT, the Knock Tap, and the Gift Wrap task – were not significantly correlated with each other with the exception of the Digit Span task and the Gift Wrap task. As previously mentioned, performance on the Digit Span task was also correlated with CFSEI, PPVT, and CSD while performance on the CGT was correlated with PPVT scores.

Vrij and Bush (2004) found that when teacher's rating of student self-confidence was used as a covariate the effect of age on suggestibility was no longer significant. Since not all age groups in the present study were administered the same self-esteem questionnaire, the analyses reported by Vrij and Bush could not be fully duplicated. However, because kindergarteners and second graders answered questions from the same form, an ANOVA was conducted with these age groups – total suggestibility was the dependant variable, condition and age were independent variables, and raw CFSEI score was a covariate. Raw CFSEI scores were a significant covariate, $F(1, 95) = 12.29, p = .001, \eta^2 = .12$. Condition was still a significant predictor, $F(1, 95) = 58.28, p < .001, \eta^2 = .38$, but grade was not, $F(1, 95) = 2.06, p = .16$, thus partially replicating the findings of Vrij and Bush. Additionally, for kindergartners and second graders, raw CFSEI scores and grade were correlated, $r = .22, p = .03$.

The correlations among variables within each grade and across conditions were examined and some interesting patterns emerged (see Tables 12 -14). Overall, the pattern of correlations for the kindergarteners was similar to pattern of correlations across age groups with a few notable exceptions. For example, within this age group, performance on the gift wrap task was significantly and negatively correlated with CSD and PPVT scores. It was also marginally negatively correlated with CFSEI (see Table 12).

Most of the correlations for the second-graders failed to meet significance criteria of $\alpha \leq .05$ (see Table 13). The only exceptions were that CFSEI and CSD were significantly correlated, as were CSD and YCSD. Since the sample size is similar for all three groups, there should not be a power issue with detecting correlations in the sample of second-graders compared to the other samples included in this study.

The pattern of correlations for fourth-graders was also similar to the pattern of correlations found for the entire sample (see Table 14). However, scores on the Knock Tap were significantly, negatively correlated with PPVT scores. RWC was significantly and negatively correlated with CSD and Knock Tap scores and significantly and positively correlated with CGT.

Correlations between total suggestibility and the individual difference predictors within each grade and by interview type were computed (see Tables 15-17). For kindergartners, CGT was significantly negatively correlated with suggestibility for children in the Reinforcement Plus Suggestion group. Across groups, PPVT scores and scores on the Gift Wrap task were trending towards a significant relationship with total suggestibility. Among second graders, correlations with total suggestibility failed to reach significance at $\alpha < .05$. For fourth graders, PPVT scores were significantly correlated with total suggestibility in the Reinforcement Plus Suggestion group.

Discussion

There are three notable findings in this study. First, reinforcement was found to have a quick and powerful impact on children's suggestibility, replicating several previous studies. Reinforcement greatly increased children's rate of false allegations and also significantly increased children's false recall reports. Second, there was a main effect of age – younger children were more suggestible than older children across conditions. However, the additive effect of reinforcement on suggestibility did not decrease with age, indicating that individual differences in reinforcement-induced suggestibility are probably not due to children having passed some developmental milestone. Third, several findings indicated that suggestibility induced by reinforcement follows a different developmental trajectory than suggestibility induced by misleading questions, so future researchers should distinguish these two forms of suggestibility from each other. Each of these findings is discussed in detail in the following sections.

Reinforcement Effect

As in several prior studies (Billings et al., 2006; Finnila et al., 2003; Garven et al., 2000), reinforcement was found to have a powerful impact on children's false allegations. On average, children in the Reinforcement Plus Suggestion condition said yes to 48% of misleading items, compared to 8% by children in the Suggestive Control condition, a six-fold difference. The effect size of the reinforcement was $d = 1.37$, which would be considered very large according to the standards for effect sizes proposed by Cohen (1969). To put the size of the reinforcement effect in perspective, the error rates of the present study can be compared with those reported in another well-known study on child suggestibility. In their classic "Mousetrap" study, Ceci, Huffman, Smith, and Loftus (1994) asked children to remember two false events – having their

hand caught in a mousetrap and going to the hospital, and going on a hot air balloon ride. These researchers found that after one session of asking the children to recollect these events, 5-6 year olds assented to false reports 25% of the time. By comparison, when reinforcement was administered in the present study, kindergarteners made 60% false reports and second graders made 45% false reports.

The effect of reinforcement on suggestibility was similar for answers to both mundane and fantastic items. Children in the Reinforcement Plus Suggestion group acquiesced to an average of 49% of misleading mundane questions and 45% of misleading fantastic questions compared to 8% and 7% in the Suggestive Control condition. Though the mundane items are not as improbable as the fantastic items, they were written to be forensically relevant behaviors – that is, they involve touching and hurting a child and telling the child to keep a secret – commonly reported in sexual abuse cases. Additionally, the fantastic items were derived directly from the McMartin interviews and the items are implausible, especially in the context of a school visitor.

Overall, few children made false allegations of wrongdoing against Paco in the free recall interview that occurred two weeks after his visit. This finding is surprising in light of previous research, which has found that children reinforced for making false allegations during one interview will tend to repeat those allegations during a second interview in response to yes/no questions, even though no additional reinforcement is given during the second interview (Garven et al., 2000). Strikingly, Camilletti (2010) found that children who were interviewed in one interview with high social pressure (reinforcement plus other techniques) tended to acquiesce to completely new allegations in a second interview in response to misleading questions, again even though no additional reinforcement was given during the second interview. Based on these

findings, more children in the reinforcement group in the present study were expected to include false allegations in their free recall report.

Though few children overall included false reports in their free recall interview, children who received reinforcement in the first interview and younger children were significantly more likely to make false reports of wrongdoing by Paco in the free recall interview. The importance of the social situation leads to one possible explanation for this finding. Anecdotal observations suggested that some children in the current study may have learned the “rule” for performing well (receiving praise) in the first interview – say yes to everything that the interviewer suggests. If this explanation is correct and children in previous studies learned the same rule, it may be that when these children were placed in the same situation again a week later, they remembered the rule and acted accordingly. However, the rule for success – always say yes to the interviewer’s suggestions – could not be applied by the children in the free recall interview, who were only asked one yes/no question. Therefore, these children may have generally relied on their original memory of Paco’s visit instead of trying to remember suggestions from the first interview.

Although this explanation may apply to many children who were reinforced and then questioned using free recall, it cannot apply to them all, because some children did include false allegations from the first interview in response to the open-ended prompt at the second interview, “Tell me everything you remember about Paco’s visit.” For example, one child’s response was “He said bad words, and he wore a crazy hat, he told a secret to me, he gave me a kiss on my nose and... and... and... Paco hit somebody with a toy and that’s it,” (Child 2008). All of these actions came almost directly from the items in Interview One, and only one of them is true – that Paco wore a crazy hat. This suggests that some children are relying on the first interview as a source of information about what to include in their free recall reports.

Deci, Koestner, and Ryan (1999), in a meta-analysis of the effect of extrinsic reward on intrinsic motivation, found that performance-contingent rewards significantly undermined internal motivation. It might be speculated that removing the extrinsic motivation decreased some children's motivation to include false reports in the free recall interview. However, this speculation is at odds with previous studies, such as Garven (2000) and Camilletti (2010), which found that reinforcement in the first interview still had a large impact on the second interview, even when reinforcement was no longer present.

London, Bruck, and Melnyk (2009) found that free recall reports one week and 10 months after a magic show did not include much misinformation from a previous interview. However, they did find that the recognition data presented a different story – there was a significant misinformation effect when the recognition data were examined. This is consistent with the findings in the present study – when children were given an opportunity to recall the event details without any cues, they tended to give accurate reports. However, when children were asked specific questions, they were quite susceptible to misinformation even though they did not include it in their free recall report. This finding highlights the importance of further research to understand the long-term implications of suggestive interviews.

Age Effect and the Additive Effect of Reinforcement

Kindergarteners were more suggestible than older children regardless of interview type. In the Reinforcement Plus Suggestion condition, kindergarteners acquiesced to an average of 60% of misleading questions, compared to 45% for second graders, and 40% for fourth graders, who did not differ significantly.

Researchers generally agree that children are more suggestible than adults and that young children, especially preschoolers, are more suggestible than older children (Bruck, Ceci, &

Hembrooke, 2002). However, some researchers argue that the perception that younger children are especially prone to suggestibility may actually be a misconception (Bruck & Ceci, 2004).

The research examining suggestibility in older children is limited and somewhat conflicting. For example, Finnila et al. (2003; in Study 1) found that 4-5 year olds were more suggestible than 7-8 year olds on the Bonn Test of Statement Suggestibility. However, when a subset of these children was interviewed one week after a classroom visit, there was no age difference in suggestibility.

Some anecdotal observations from the present study suggest that reinforcement-induced suggestibility may be driven by social expectations, especially among older children. For example, about half-way through a Reinforcement Plus Suggestion interview, a second-grader commented “Everything’s yes?” (Child 1711), suggesting that she understood that the interviewer wanted her to say yes to everything, regardless of what really happened. A few children also asked if the questions were “trick questions.” Though this is anecdotal evidence, it does suggest that false reports in the first interview may be the result of compliance to the interviewer.

Anecdotal evidence from the interviews of the older children also suggests that children may make a conscious and strategic choice about whether or not to go along with the interviewer. Some children, especially fourth graders, seemed to be testing out different response patterns. Though fourth graders still exhibited a somewhat U-shaped distribution, there were more children who fell in between the two extremes of responding than in the younger age groups. This may also suggest that these children were testing the waters. That is, some of these children seemed to “try out” saying yes one or more times and then decided whether it was worth the reward.

Though there was a significant age effect in the present study such that older children were less suggestible than younger children, it is important to recognize that the level of reinforcement-induced suggestibility was very high in all age groups. For example, the fourth graders in the Reinforcement Plus Suggestion condition, who were more than 9 ½ years old on average, said yes to an average of 40% of misleading questions – compared to 4% by fourth graders in the Suggestive Control condition. This finding was unexpected and contrary to the hypotheses of the study, which anticipated that children in fourth grade would not be highly suggestive in response to reinforcement. Contrary to what was hypothesized, the interaction between reinforcement and grade was not significant. That is, the *additive effect* of reinforcement did not significantly differ among the age groups. For kindergarteners, second graders, and fourth graders, the use of reinforcement increased false allegation rates by approximately 40% for all children questioned (see Figure 4).

The high level of false allegations in the oldest group of children suggests that the bimodal, U-shaped distribution of reinforcement-induced suggestibility observed in the present study and in earlier research by Camilletti et al. (2010) is unlikely to be due to some children having passed a developmental milestone. That is, if the two modes of the U-shaped distribution among kindergarteners represented the 50% of children who had passed a developmental milestone (i.e., children with 0 or 1 yes answers) versus the 50% of children who had not passed it (i.e., children with 11 or 12 yes answers), then high rates of suggestibility among fourth graders would not be expected, because most of the older children would be expected to have passed the milestone during the four years between kindergarten and fourth grade.

Reinforcement-Induced Suggestibility vs. Misleading Questions

The idea that there may be different types of suggestibility with different psychological mechanisms has been recognized by some prior experts. For example, Gudjonsson (1984) distinguished “yield” suggestibility (a tendency to assent to leading questions) and “shift” suggestibility (a tendency to change one’s answers in response to negative interviewer feedback). Similarly, in their review of the literature on individual differences and suggestibility, Bruck and Melnyk (2004) identified several different categories of suggestibility, including not only yield and shift, but also misinformation effects, source monitoring, and false reports.

Several findings of the present study provide support for the view that there are at least two different kinds of suggestibility – reinforcement-induced suggestibility and suggestibility induced by misleading questions alone – and that they have different characteristics. First, as noted in the previous section, these two kinds of suggestibility appear to have different developmental trajectories. Specifically, suggestibility due to misleading questions decreases steadily from ages 5 to 10, whereas the additive effect of reinforcement stays consistent across these age groups. As already noted, the literature concerning age effects on suggestibility has yielded some inconsistent findings, thus lending further support to the idea that there are two or more types or subtypes of suggestibility with different developmental trajectories. The generalization that “suggestibility decreases with age” may be more applicable to suggestibility induced by misleading questions than to suggestibility induced by reinforcement.

A second reason to distinguish between the two kinds of suggestibility is the striking difference in their frequency distributions: Among reinforced children false allegations fit a bimodal U-shaped frequency distribution, whereas among children in the Suggestive Control group false allegations fit a unimodal L-shaped distribution. The stark difference between the

two distributions strongly suggests that reinforcement-induced suggestibility operates differently from suggestibility induced by misleading questions alone

The third piece of evidence supporting the distinction between reinforcement-induced suggestibility and reinforcement due to misleading questions alone concerns their different patterns of correlation with children's cognitive, emotional, and motivational characteristics. For children in the Reinforcement Plus Suggestion condition, the only significant predictor of suggestibility was self-esteem, as measured by the CFSEI-3. Specifically, there was a strong negative correlation between self-esteem and suggestibility when children received reinforcement, meaning that children with lower self-esteem were more suggestible. It appears that children with poorer concepts of themselves were more willing to give a false response in order to win positive feedback from the interviewer. This result is consistent with Howie and Dowd's (1996) finding that children with higher self-esteem were less suggestible, but is at odds with Chae and Ceci's (2005) finding that self-esteem and suggestibility were positively correlated. Chae and Ceci argue that their finding, which contradicts previous research, may be due to their use of child-ratings of self-perception rather than teacher-ratings. However, the current study used child-based ratings of self-esteem and is consistent with previous research.

Exploratory analyses in the present study using raw self-esteem scores of kindergarteners and second graders replicated Vrij and Bush's (2000) finding that controlling for self-esteem washed out the effect of age on reinforcement. It may be that developmental increases in self-esteem are related to developmental changes in suggestibility. Vrij and Bush argue that social experience gained by older children in taking on and succeeding with new challenges helps build self-confidence. Therefore, Vrij and Bush generally expect older children to be more confident in general than younger children, so age and self-esteem are somewhat entangled. However,

grade-normed self-esteem scores were a significant predictor in the present study, suggesting that self-esteem is also an important predictor of suggestibility within grade groups.

The findings of the present study complement and extend those of Vrij and Bush (2000). These researchers asked only four misleading questions, compared to the 12 used in the present study. Second, the researchers used six items to evaluate self-confidence while the current study used a reliable and valid self-esteem scale consisting of 29 items. Third, self-esteem in the present study was based on children's reports instead of teacher reports. Last, children were interviewed about a live event. Even with these differences the current study replicated the finding of Vrij and Bush.

The individual difference findings observed in the Reinforcement Plus Suggestion group only partially overlapped with those observed in the Suggestive Control group. Among children in the Suggestive Control condition, suggestibility was not significantly correlated with self-esteem though it was significantly negatively, correlated with socially desirable responding as measured by the CSD although CSD scores were only marginally significant as predictors in a hierarchical regression. The somewhat different pattern of individual difference correlates provides some limited additional support for the idea that reinforcement-induced suggestibility and suggestibility induced by misleading questions may involve different or only partially overlapping psychological processes.

Finnila et al. (2003) found that a high social pressure interview had a greater impact on suggestibility than individual differences. The findings of the present study reveal a similar pattern: Reinforcement had a very large effect on suggestibility while individual differences accounted for a much smaller proportion of the variance in total suggestibility. In addition, none of the measures related to intelligence or executive function were related to suggestibility in this

condition, supporting the idea that Reinforcement-Induced suggestibility may be more related to social or motivational factors rather than to cognitive factors.

When these analyses were broken down by grade and interview type, a few interesting findings emerged. First, total suggestibility was marginally correlated with PPVT and Gift Wrap task scores for kindergartners, across groups. These findings are consistent with previous research by Camilletti et al. (2010) and Scullin and Ornelas (2009). Second, PPVT scores were correlated significantly with total suggestibility for fourth graders, but only in the Reinforcement Plus Suggestion group.

One of the goals of this study was to determine whether reinforcement-induced suggestibility was related to passing a developmental milestone or to more stable individual differences. As noted earlier, the study's findings indicate that reinforcement-induced suggestibility probably cannot be explained as due to children not having passed a particular developmental milestone. However, neither do these findings support the alternative explanation that individual differences in children's suggestibility are related to stable individual differences in cognition, motivation or personality. The bimodal distribution of suggestibility seen in the Reinforcement Plus Suggestion group suggests that there are two fairly distinct groups of children, those who respond to reinforcement by becoming more suggestible and those who do not. However, neither the present study nor earlier ones (see Bruck & Melnyk, 2004) have succeeded in shedding much light on this between-groups difference. The only predictive factor identified in the present study – self-esteem – does not appear strong enough to account for the U-shaped distribution of reinforcement-induced suggestibility

Practical Implications and Future Directions

This study has once again demonstrated that reinforcement has a swift and powerful negative impact on children's suggestibility. Children up through at least the age of nine can easily be induced to make false-allegations about forensically relevant details such as touching and potential violence. Clearly, these are techniques that interviewers should avoid at all costs. It appears that these techniques are especially dangerous if a child is younger or has lower self-esteem though even the oldest children in this study acquiesced to 40% of misleading questions with reinforcement.

Some might argue that these techniques may not be seriously detrimental, because most children in the present study did not include false reports in their free recall interviews. Though it is good news that few children included false allegations in their free recall reports, several children did and some of these allegations involved harm and touching. More research is needed on the lasting effects of reinforcement.

It should be noted that the free recall interview used in the present study may lack ecological validity. That is, it does not reflect what happens in real legal cases that involve allegations by children. For instance, if a child makes allegations in their first interview with Child Protective Services or the police and then does not include any of their false allegations in a later report, the interviewer is unlikely simply to accept the child's new report without question. It is possible that the second report will be disregarded or that the interviewer will engage in questioning to encourage the child to repeat the allegations she made in the initial interview. Once an interviewer is convinced that certain events happened, these beliefs are likely to shape the questions asked and influence the interviewer's acceptance of contradictory reports.

Also, if interviewers then conduct multiple interviews, it is possible that the child will become more likely to “remember” the false event, though more research on this topic is needed.

There are several directions for future research. First, this study found that the majority of children did not include false allegations in their free recall reports. One area for future research is to determine whether engaging a child in multiple reinforcement interviews has a greater negative impact on free recall reports. Second, it would be interesting to determine what exactly is driving the reinforcement effect – is it the positive or negative consequences? Behavioral psychology has found that positive consequences are better for behavior change than negative consequences – it would be interesting to examine if one of these aspects is really causing the reinforcement effect. The findings of this study also suggest that further research is needed to examine if the suggestibility in multiple reinforcement interviews is compliance or if it can have long-term effects on memory.

Another area for future research is to examine the age, suggestibility, and self-esteem relation further. It would be a good idea for future studies to include one measure of self-esteem that is the same for all age groups to allow between-age-group comparisons. Another question left unanswered by this study is one of the basic questions this study was trying to answer – what is driving the bimodal, U-shaped distribution for children who receive reinforcement? That is, why do some children say yes to everything while some children deny everything? It may be that children are making a choice early on in the interview about what they’re going to do and once they make that choice, they stick to it. One possible way to address this question is to ask the children why they answered a certain way once the interview is over, though this may require a level of metacognitive awareness not present in young children.

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Table 1

Total Suggestibility by Interview Type and Grade

Grade	Suggestive Plus Reinforcement			Suggestive Control		
	n	<i>M</i> (<i>SD</i>)	95% CI	n	<i>M</i> (<i>SD</i>)	95% CI
K	22	.60 (.40)	[.48, .72]	26	.15 (.20)	[.04, .27]
2 nd	25	.45 (.42)	[.34, .57]	27	.04 (.05)	[-.07, .15]
4 th	28	.40 (.66)	[.30, .51]	26	.04 (.09)	[-.07, .16]
Total	75	.48 (.39)	[.42, .55]	79	.08 (.14)	[.02, .14]

Table 2

Correlations between Grade and Individual Difference Variables

Variable ^a	Correlation with Grade		
	Reinforcement Plus Suggestion	Suggestive Control	Total
Total Suggestibility	-.20 ⁺	-.32**	-.14 ⁺
CSD	-.23*	-.20	-.21*
YCSD	-.53***	-.51***	-.52***
CGT	.13	.01	.07
Digit Span	.33**	.34**	.34***
Knock-Tap	.15	.05	.10
Gift Wrap Task	-.19	-.21 ⁺	-.20*
Word Count	.46***	.42***	.41***

Note: ^a CSD = Children's Social Desirability Questionnaire, (Crandall, Crandall, & Katovsky, 1965), YCSD = Young Children's Social Desirability Scale, (Ford & Rubin, 1970), CGT = Children's Gambling Task, (Kerr & Zelazo, 2004)

⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 3

Partial Correlations for Children in the Reinforcement Plus Suggestion Condition Controlling for Grade

Variable ^a	1	2	3	4	5	6	7	8	9	10	11
1.Suggestibility											
2.Gender	.12										
3.Delay Length	.02	.01									
4.CFSEI-3	-.33**	.02	.18								
5.PPVT-4	-.18	-.20	.20 ⁺	.49***							
6. CSD	-.20 ⁺	-.01	.03	.40**	.18						
7.YCSD	-.05	.01	.07	.12	.04	.67***					
8.Digit Span	-.06	.06	-.08	.14	.36**	.29*	.09				
9.CGT	-.19	-.10	-.14	.15	.23*	.05	-.15	.01			
10.Knock-Tap	-.05	.01	.13	.08	.04	.05	.08	.13	-.13		
11.Gift Wrap Task	-.07	-.03	.14	-.14	-.01	-.24*	-.08	-.20	-.03	-.06	
12. Word Count	-.02	-.17	-.04	.21	.32*	.00	-.22+	.18	.13	-.14	-.12

Note: ^a CFSEI = Culture-Free Self-Esteem Inventories, 3rd edition, (Battle, 2002), PPVT-4 = Peabody Picture Vocabulary Test, 4th edition, (Dunn & Dunn, 2007), CSD = Children's Social Desirability Questionnaire, (Crandall, Crandall, & Katovsky, 1965), YCSD = Young Children's Social Desirability Scale, (Ford & Rubin, 1970), CGT = Children's Gambling Task, (Kerr & Zelazo, 2004)

⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 4

Partial Correlations for Children in the Suggestive Control Condition Controlling for Grade

Variable ^a	1	2	3	4	5	6	7	8	9	10	11
1.Suggestibility											
2.Gender	-.03										
3.Delay Length	.11	-.03									
4.CFSEI-3	-.18	.08	-.02								
5.PPVT-4	-.14	.26*	-.00	.24*							
6. CSD	-.28*	.09	-.03	.46***	.00						
7.YCSD	-.11	.27*	-.02	.29*	-.04	.66***					
8.Digit Span	-.11	-.03	.16	.25*	.34**	.12	.01				
9.CGT	.13	.05	.07	.03	.09	-.29*	-.12	.08			
10.Knock-Tap	-.11	-.14	.23*	-.00	-.04	.07	.12	.08	-.02		
11.Gift Wrap Task	.22 ⁺	-.02	-.14	-.07	-.11	.04	-.01	-.13	.08	-.07	
12. Word Count	-.19	.15	.07	.09	.29*	.04	-.04	.32**	.17	-.16	-.02

Note: ^a CFSEI = Culture-Free Self-Esteem Inventories, 3rd edition, (Battle, 2002), PPVT-4 = Peabody Picture Vocabulary Test, 4th edition, (Dunn & Dunn, 2007), CSD = Children's Social Desirability Questionnaire, (Crandall, Crandall, & Katovsky, 1965), YCSD = Young Children's Social Desirability Scale, (Ford & Rubin, 1970), CGT = Children's Gambling Task, (Kerr & Zelazo, 2004)

⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 5

Hierarchical Multiple Regression Predicting Total Suggestibility from Grade, Self-Esteem, PPVT, and CSD for Children in the Reinforcement Plus Suggestion Condition

Predictor ^a	Total Suggestibility	
	ΔR^2	standardized β
Step 1	.04	
Grade		-.20 ⁺
Step 2	.12*	
CFSEI-3		-.30*
PPVT-4		-.03
CSD		-.08

Note: ^a CFSEI = Culture-Free Self-Esteem Inventories, 3rd edition, (Battle, 2002), PPVT-4 = Peabody Picture Vocabulary Test, 4th edition, (Dunn & Dunn, 2007), CSD = Children's Social Desirability Questionnaire, (Crandall, Crandall, & Katovsky, 1965)

⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 6

Hierarchical Multiple Regression Predicting Total Suggestibility from Grade, Self-Esteem, PPVT, and CSD for Children in the Suggestive Control Condition

Predictor ^a	Total Suggestibility	
	ΔR^2	standardized β
Step 1	.09*	
Grade		-.29*
Step 2	.13*	
CFSEI-3		-.06
PPVT-4		-.22 ⁺
CSD		-.24 ⁺

Note: ^a CFSEI = Culture-Free Self-Esteem Inventories, 3rd edition, (Battle, 2002), PPVT-4 = Peabody Picture Vocabulary Test, 4th edition, (Dunn & Dunn, 2007), CSD = Children's Social Desirability Questionnaire, (Crandall, Crandall, & Katovsky, 1965)

⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 7

Multiple Regression Predicting Total Suggestibility from Grade, Condition, Self-Esteem, PPVT, and CSD for all children

Predictor ^a	Total Suggestibility
	standardized β
Interview Type	.60***
Grade	-.18*
CFSEI-3	.30
PPVT	-.12
CSD	-.11
Interview Type by CFSEI	-.50*
Interview Type by PPVT	.07
Interview Type by CSD	.03
R^2	.44
F	12.82***

Note: ^a CFSEI = Culture-Free Self-Esteem Inventories, 3rd edition, (Battle, 2002), PPVT-4 = Peabody Picture Vocabulary Test, 4th edition, (Dunn & Dunn, 2007), CSD = Children's Social Desirability Questionnaire, (Crandall, Crandall, & Katovsky, 1965)

⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 8

Presence of False Reports by Grade and Interview Type

	Type of False Report			
	Suggestions from Interview One		Other	
	Reinforcement Plus Suggestion	Suggestive Control	Reinforcement Plus Suggestion	Suggestive Control
Kinder	2	0	11	3
2 nd	3	0	3	1
4 th	2	1	3	0

Table 9

Proportion of Mundane Questions Answered “Yes” by Interview Type and Grade

Grade	Suggestive Plus Reinforcement			Suggestive Control		
	n	<i>M</i> (<i>SD</i>)	95% CI	n	<i>M</i> (<i>SE</i>)	95% CI
K	22	0.59 (.40)	[0.47, 0.70]	26	0.16 (.21)	[.05, .27]
2 nd	25	0.46 (.41)	[0.35, 0.57]	27	0.05 (.08)	[-.06, .15]
4 th	28	0.45 (.33)	[0.34, 0.55]	26	0.04 (.08)	[-.07, .15]
Total	75	0.49 (.38)	[0.43, 0.56]	79	0.08 (.15)	[.02, .15]

Table 10

Proportion of Fantastic Questions Answered “Yes” by Interview Type and Grade

Grade	Suggestive Plus Reinforcement			Suggestive Control		
	n	<i>M</i> (<i>SD</i>)	95% CI	n	<i>M</i> (<i>SD</i>)	95% CI
K	22	0.63 (.43)	[.48, .77]	26	0.13 (.28)	[.00, .27]
2 nd	25	0.43 (.48)	[.30, .57]	27	0.03 (.08)	[-.10, 0.16]
4 th	28	0.32 (.42)	[.19, .45]	26	0.05 (.20)	[-.09, 0.18]
Total	75	0.45 (.45)	[.38, .57]	79	0.07 (.21)	[-.01, 0.15]

Table 11

Correlations between Individual Difference Variables Controlling for Grade

Variable ^a	1	2	3	4	5	6	7	8	9	<i>M</i>	<i>SD</i>
1. Gender										0.61	0.49
2. CFSEI-3	.06									100.07	14.89
3. PPVT-4	.04	.35***								101.36	13.67
4. CSD	.04	.43***	.09							30.81	7.71
5. YCSD	.13	.20*	.00	.66***						15.12	5.16
6. Digit Span	.01	.19*	.35***	.20*	.05					4.34	1.29
7. CGT	-.01	.09	.16 ⁺	-.13	-.14 ⁺	.05				3.29	8.26
8. Knock-Tap	-.05	.04	.01	.05	.09	.11	-.06			27.64	3.87
9. Gift Delay	.01	-.10	-.06	-.09	-.05	-.17*	.03	-.07		0.29	0.51
10. Word Count	.02	.11	.30***	.01	-.11	.26**	.14	-.13	-.05	208.89	142.10

Note: ^a CFSEI = Culture-Free Self-Esteem Inventories, 3rd edition, (Battle, 2002), PPVT-4 = Peabody Picture Vocabulary Test, 4th edition, (Dunn & Dunn, 2007), CSD = Children's Social Desirability Questionnaire, (Crandall, Crandall, & Katovsky, 1965), YCSD = Young Children's Social Desirability Scale, (Ford & Rubin, 1970), CGT = Children's Gambling Task, (Kerr & Zelazo, 2004)

⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 12

Correlations between Variables for Kindergarteners

Variable ^a	1	2	3	4	5	6	7	8	9	10
1. Gender										
2. Delay Length	.27 ⁺									
3. CFSEI-3	.15	.14								
4. PPVT-4	.11	-.02	.55**							
5. CSD	.24	.17	.62**	.52**						
6. YCSD	.30*	.03	.36*	.25 ⁺	.75***					
7. Digit Span	.19	-.07	.34*	.58**	.42**	.07				
8. CGT	-.19	-.24 ⁺	.16	.16	-.09	-.16	-.00			
9. Knock-Tap	-.02	.19	.04	.13	.15	.18	.19	.07		
10. Gift Wrap Task	.01	-.11	-.29 ⁺	-.29*	-.44**	-.23	-.22	-.14	-.11	
11. Word Count	-.15	-.16	.36*	.42**	.35*	.04	.24	.20	.02	-.24

Note: ^a CFSEI = Culture-Free Self-Esteem Inventories, 3rd edition, (Battle, 2002), PPVT-4 = Peabody Picture Vocabulary Test, 4th edition, (Dunn & Dunn, 2007), CSD = Children's Social Desirability Questionnaire, (Crandall, Crandall, & Katovsky, 1965), YCSD = Young Children's Social Desirability Scale, (Ford & Rubin, 1970), CGT = Children's Gambling Task, (Kerr & Zelazo, 2004)

⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 13

Correlations between Variables for Second Graders

Variable ^a	1	2	3	4	5	6	7	8	9	10
1. Gender										
2. Delay Length	.00									
3. CFSEI-3	-.01	.14								
4. PPVT-4	.04	.21	.05							
5. CSD	-.00	-.10	.38**	-.23						
6. YCSD	.06	-.02	.17	-.10	.66**					
7. Digit Span	-.15	-.22	-.01	.07	.10	.05				
8. CGT	.07	-.01	.05	.12	-.08	-.13	.04			
9. Knock-Tap	-.07	.16	.11	.14	-.05	-.04	.15	-.16		
10. Gift Wrap Task	.01	.00	-.10	-.05	.07	-.02	-.17	.10	.01	
11. Word Count	.08	-.06	.02	-.08	.21	-.09	-.03	-.28 ⁺	-.02	.01

Note: ^a CFSEI = Culture-Free Self-Esteem Inventories, 3rd edition, (Battle, 2002), PPVT-4 = Peabody Picture Vocabulary Test, 4th edition, (Dunn & Dunn, 2007), CSD = Children's Social Desirability Questionnaire, (Crandall, Crandall, & Katovsky, 1965), YCSD = Young Children's Social Desirability Scale, (Ford & Rubin, 1970), CGT = Children's Gambling Task, (Kerr & Zelazo, 2004)

⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 14

Correlations between Variables for Fourth Graders

Variable ^a	1	2	3	4	5	6	7	8	9	10
1. Gender										
2. Delay Length	-.25 ⁺									
3. CFSEI-3	.04	.07								
4. PPVT-4	-.04	.16	.42**							
5. CSD	-.02	.05	.32*	-.02						
6. YCSD	.14	.14	.08	-.10	.52**					
7. Digit Span	.02	.17	.28*	.41**	.14	.02				
8. CGT	.10	.08	.04	.21	-.23	-.11	.13			
9. Knock-Tap	-.04	.25 ⁺	-.03	-.27*	-.02	.15	-.04	-.12		
10. Gift Wrap Task	.02	.18	.15	.23	.16	.16	-.12	.25	-.15	
11. Word Count	.08	.08	.00	.40**	-.33*	-.11	.46**	.38**	-.34*	.13

Note: ^a CFSEI = Culture-Free Self-Esteem Inventories, 3rd edition, (Battle, 2002), PPVT-4 = Peabody Picture Vocabulary Test, 4th edition, (Dunn & Dunn, 2007), CSD = Children's Social Desirability Questionnaire, (Crandall, Crandall, & Katovsky, 1965), YCSD = Young Children's Social Desirability Scale, (Ford & Rubin, 1970), CGT = Children's Gambling Task, (Kerr & Zelazo, 2004)

⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 15

Correlations between Total Suggestibility and Individual Difference Variables for Kindergarteners by Condition

Variable ^a	Total Suggestibility		
	Reinforcement Plus Suggestion	Suggestive Control	All Kindergarteners
CFSEI-3	-.49*	-.39*	-.41**
PPVT-4	-.23	-.31	-.24 ⁺
CSD	-.38 ⁺	-.54*	-.31*
YCSD	-.16	-.27	-.15
CGT	-.51*	.07	-.30*
Digit Span	-.33	-.20	-.22
Knock-Tap	-.18	-.13	-.20
Gift Wrap Task	.36	.31	.28 ⁺
Word Count	-.27	-.37	-.33*

Note: ^a CFSEI = Culture-Free Self-Esteem Inventories, 3rd edition, (Battle, 2002), PPVT-4 = Peabody Picture Vocabulary Test, 4th edition, (Dunn & Dunn, 2007), CSD = Children's Social Desirability Questionnaire, (Crandall, Crandall, & Katovsky, 1965), YCSD = Young Children's Social Desirability Scale, (Ford & Rubin, 1970), CGT = Children's Gambling Task, (Kerr & Zelazo, 2004)

⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 16

Correlations between Total Suggestibility and Individual Difference Variables for Second Graders by Condition

Variable ^a	Total Suggestibility		
	Reinforcement Plus Suggestion	Suggestive Control	All Second Graders
CFSEI-3	-.29	-.33	-.07
PPVT-4	.16	.02	.11
CSD	-.26	-.22	-.00
YCSD	.02	.09	.10
CGT	.04	.20	.21
Digit Span	.06	-.22	-.02
Knock-Tap	-.06	-.24	-.15
Gift Wrap Task	-.32	.07	-.18
Word Count	.24	-.35 ⁺	.12

Note: ^a CFSEI = Culture-Free Self-Esteem Inventories, 3rd edition, (Battle, 2002), PPVT-4 = Peabody Picture Vocabulary Test, 4th edition, (Dunn & Dunn, 2007), CSD = Children's Social Desirability Questionnaire, (Crandall, Crandall, & Katovsky, 1965), YCSD = Young Children's Social Desirability Scale, (Ford & Rubin, 1970), CGT = Children's Gambling Task, (Kerr & Zelazo, 2004)

⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 17

Correlations between Total Suggestibility and Individual Difference Variables for Fourth Graders by Condition

Variable ^a	Total Suggestibility		
	Reinforcement Plus Suggestion	Suggestive Control	All Fourth Graders
CFSEI-3	-.19	.03	-.04
PPVT-4	-.38*	-.07	-.30*
CSD	.01	.19	.06
YCSD	.37 ⁺	.14	.17
CGT	-.10	.08	-.06
Digit Span	.06	.07	.02
Knock-Tap	.21	.06	.13
Gift Wrap Task	-.26	.37 ⁺	-.06
Word Count	.02	-.12	-.19

Note: ^a CFSEI = Culture-Free Self-Esteem Inventories, 3rd edition, (Battle, 2002), PPVT-4 = Peabody Picture Vocabulary Test, 4th edition, (Dunn & Dunn, 2007), CSD = Children's Social Desirability Questionnaire, (Crandall, Crandall, & Katovsky, 1965), YCSD = Young Children's Social Desirability Scale, (Ford & Rubin, 1970), CGT = Children's Gambling Task, (Kerr & Zelazo, 2004)

⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

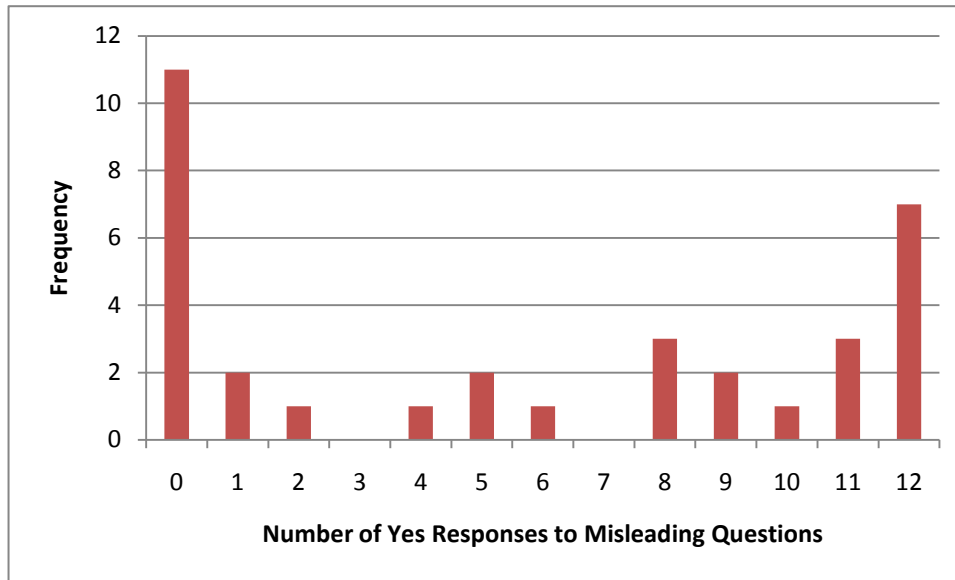


Figure 1. Frequency of “Yes” Responses to Misleading Items in Camilletti et al. (2010)

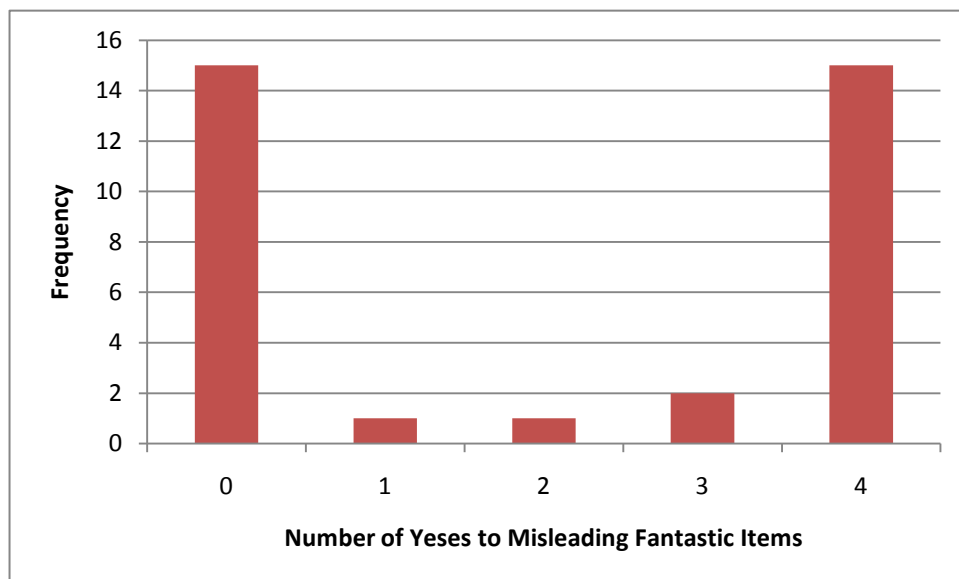


Figure 2. Frequency of “Yes” Responses to Fantastic Items in the Camilletti et al. (2010)

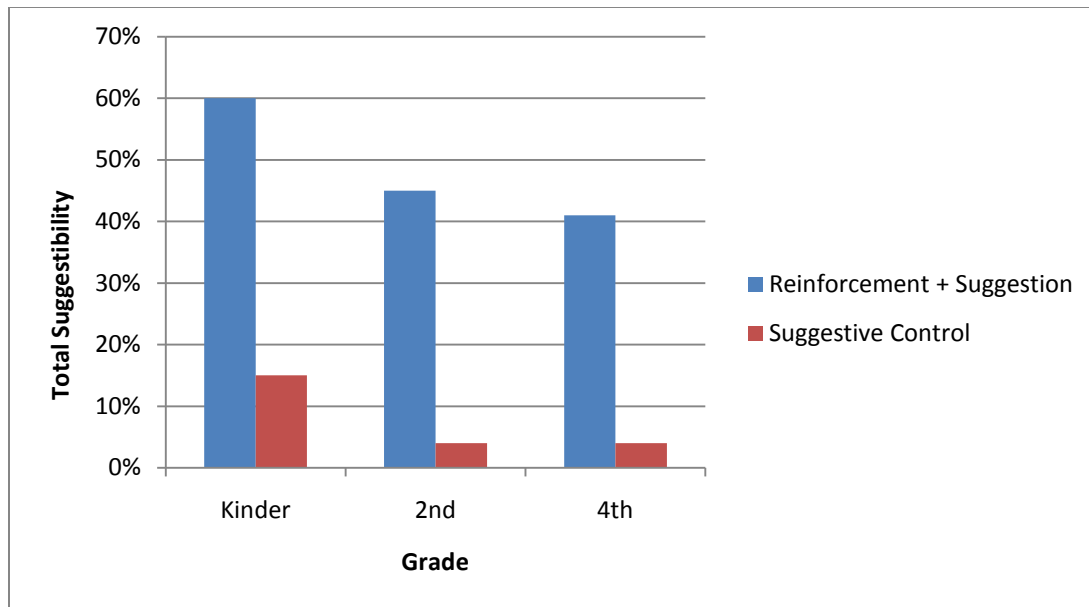


Figure 3. Main Effects for Interview Type and Grade on Total Suggestibility

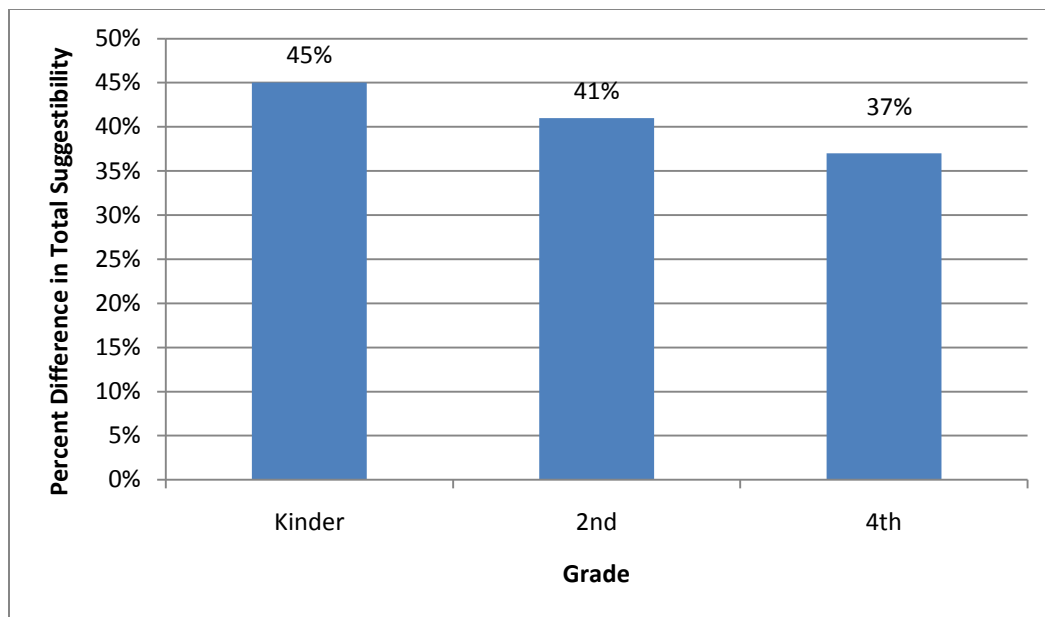


Figure 4. Percent Difference in Total Suggestibility between Reinforcement Plus Suggestion Group and Suggestive Control Group

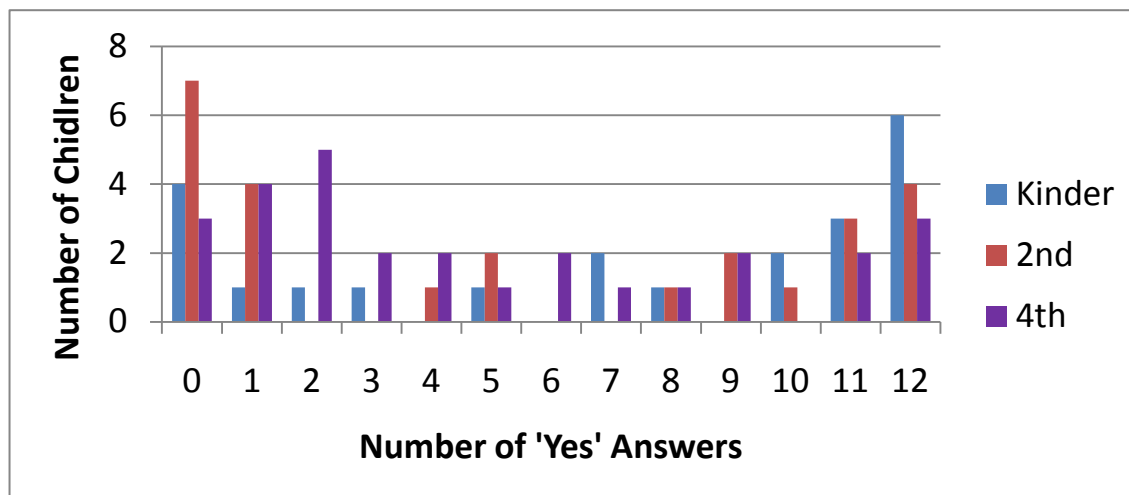


Figure 5. Frequency of “Yes” Responses to Misleading Items for Reinforcement Plus Suggestion

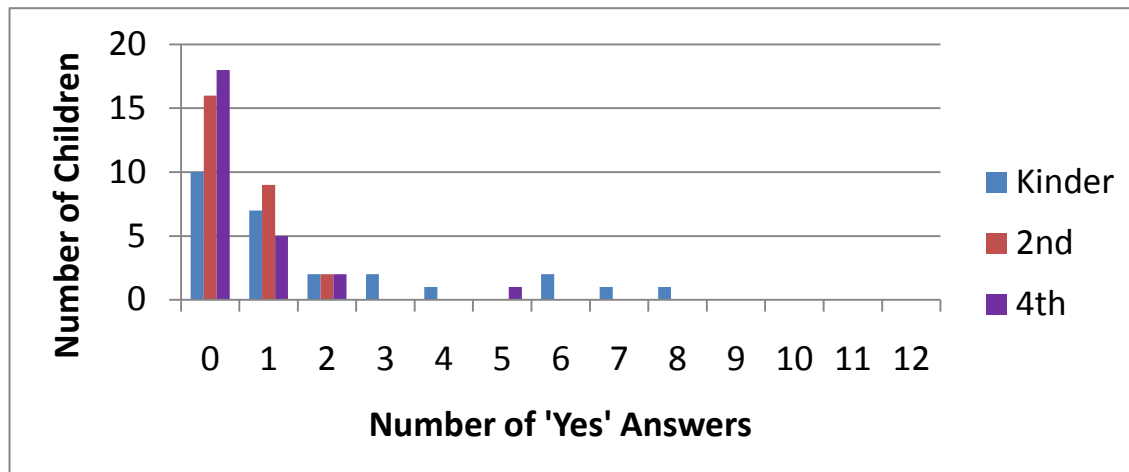


Figure 6. Frequency of “Yes” Responses to Misleading Items for Suggestive Control

Appendix A. Parental Consent Form

Informed Consent – The Effect of Feedback on Children’s Memory

Dear Parent(s)/Legal Guardian(s):

Hello, the UTEP Psychology department is asking permission for your child to participate in a study that we are doing at [INSERT SCHOOL NAME]. Your child is being asked to participate because they are enrolled in Kindergarten or 2nd Grade, or 4th Grade in an El Paso county school. Approximately 150 students will be enrolled in this study.

If you give permission, your child will participate in three sessions at their school. For each child who participates in this study, \$5 will be donated to the child’s classroom or school. A visitor to their school will perform a science demonstration. Later, children will be asked questions about the things the visitor did and did not do during his visit. Children will receive feedback (such as encouragement or doubt) about their responses. Children will also be asked to identify pictures of common items and activities, to participate in a task in which they will be able to win treats (such as M&Ms), and to answer questions about themselves. Children will also complete a short memory test and tests of their ability to hold back certain responses. Portions of these sessions will be video taped so that researchers can verify their notes.

This study is not expected to have any physical or psychological risk to your child. Any and all individual data collected from this research will be kept completely confidential and will be seen only by researchers involved in the project. Your child’s name and participation in the study will be kept confidential, and each child’s data will be kept anonymous. The measures in this study are not expected to elicit reports of abuse, however, if a child spontaneously reports familial child abuse, just like teachers and other professionals who work with children, we are required by the law to report this information to Child and Family Protective Services, 1-800-252-5400. Data will be analyzed at a group (not individual) level and the group level findings of the study may be presented or published. This study is not expected to be of little direct benefit to your child, but the knowledge gained may be of benefit to others. In addition to being able to view the science demonstration, your child will have the chance to win M&Ms and will be given a small toy at the end of the study. Additionally, for each child who participates in this study, \$5 will be donated to the child’s classroom or school.

We would greatly appreciate your child’s participation in this study. If you agree to allow your child to participate, please sign both copies of this letter. Return one to your child’s teacher and keep one for your records. If you have any questions about the study you may contact any of the following individuals: (1) Elizabeth Uhl (eruhl@miners.utep.edu 747-8802); (2) Dr. James Wood (jawood@utep.edu or 915-747-6570) (3) UTEP Institutional Review Board (915-747-8841 or irb.orsp@utep.edu).

Thanks very much!

Elizabeth Uhl, and Dr. James Wood

Department of Psychology, University of Texas at El Paso

Child's Name: _____ Birth date: _____

Your Name (printed): _____

Your Signature: _____ Date: _____

Child's Mark: _____

(Please have your child write his/her name or mark above to indicate willingness to participate)

Is it okay for us to give your child mini M&Ms? Yes or No

If no, can you suggest an alternative treat? _____

Is it okay for us to videotape portions of your child's interviews? Yes or No

(Videotapes will be kept confidential and viewed only by researchers.)

Health and Personal History
University of Texas El Paso

Child's RACE/ETHNICITY: <u>Please circle all that apply:</u> Alaska Native African American American Indian Asian Black Hispanic Latino Mexican Mexican American Native Hawaiian Pacific Islander White	Have you ever been told your child has any of the following: Learning disability Slow or delayed development Mental retardation Behavior Disorder Attention Problems Stuttering Eye problems Hearing Loss	
WHAT GRADE IS YOUR CHILD IN?	Current Grade: preK K 1 st 2 nd 3 rd 4 th 5 th 6 th	
CHILD'S GENDER	Male Female	
Mother's Education (check one): ____ Completed grades 1-6 ____ Completed some high school ____ Graduated High School ____ Completed some college ____ Graduated college (BA, BS) ____ Complete some graduate school ____ Completed graduate degree (MA, MS) ____ More than graduate school education	Father's Education (check one): ____ Completed grades 1-6 ____ Completed some high school ____ Graduated High School ____ Completed some college ____ Graduated college (BA, BS) ____ Complete some graduate school ____ Completed graduate degree (MA, MS) ____ More than graduate school education	

Appendix B. Paco Interview One – No Reinforcement

I want to ask you some questions about the other day when Paco Perez came and showed you the science experiments. He had on a silly hat didn't he?

1. Did Paco tear the book while he was reading it?
2. Did Paco tell the children to sit quietly and listen?
3. Did Paco steal a pen from the teacher's desk?
4. Did Paco break a toy while he was visiting?
5. Did Paco tickle your tummy?
6. Did Paco take off his funny hat?
7. Did Paco tell you a secret and tell you not to tell anyone?
8. Did Paco throw a crayon at a kid who was talking?
9. Did Paco put on goofy glasses?
10. Did Paco say a bad word?
11. Did Paco kiss you on the nose?
12. Did Paco put a sticker on your hand?
13. Did Paco take you on a helicopter ride?
14. Did Paco take you to a farm?
15. Did you see animals on the farm?
16. Did Paco take you on a horse ride?

Appendix C. Paco Interview One – Reinforcement

I want to ask you some questions about the other day when Paco Perez came and showed you the science experiments. He had on a silly hat didn't he? I want to see how good your memory is. Are you smart enough to remember? Good, because I really need your help.

1. Did Paco tear the book while he was reading it?
If yes, praise child (Good job.) and go to #2.
If no, act disappointed (I was hoping you could help.) and go to #1b.
- 1b. Are you sure? Did Paco tear the book?
If yes, praise child (Now your memory is better.) and go to #2.
If no, act disappointed (I thought you would remember.) and go to #2.
2. Did Paco tell the kids to sit quietly and listen?
If yes, praise child (Good job.) and go to #3.
If no, act disappointed (I was hoping you could help.) and go to #2b.
- 2b. Are you sure? Did Paco tell the children to sit quietly and listen?
If yes, praise child (Now your memory is better.) and go to #3.
If no, act disappointed (Maybe your memory isn't very good today.) and go to #3
3. Did Paco steal a pen from the teacher's desk?
If yes, praise child (Good job.) and go to #4.
If no, act disappointed (I was hoping you could help.) and go to #3b.
- 3b. Are you sure? Did Paco steal a pen from the teacher's desk?
If yes, praise child (Now your memory is better.) and go to #4.
If no, act disappointed (I thought you would remember.) and go to #4.
4. Did Paco break a toy while he was visiting?
If yes, praise child (Good job.) and go to #5.
If no, act disappointed (I was hoping you could help.) and go to #4b.
- 4b. Are you sure? Did Paco break a toy?
If yes, praise child (Now your memory is better.) and go to #5.
If no, act disappointed (Maybe your memory isn't very good today.) and go to #5.
5. Did Paco tickle your tummy?
If yes, praise child (Good job.) and go to #6.
If no, act disappointed (I was hoping you could help.) and go to #5b.
- 5b. Are you sure? Did Paco tickle your tummy?
If yes, praise child (Now your memory is better.) and go to #6.
If no, act disappointed (I thought you would remember.) and go to #6.
6. Did Paco take off his funny hat?
If yes, praise child (Good job.) and go to #7.
If no, act disappointed (I was hoping you could help.) and go to #6b.
- 6b. Are you sure? Did Paco take off his funny hat?
If yes, praise child (Now your memory is better.) and go to #7.
If no, act disappointed (Maybe your memory isn't very good today.) and go to #7.

7. Did Paco told you a secret and tell you not to tell anyone?
If yes, praise child (Good job.) and go to #8.
If no, act disappointed (I was hoping you could help.) and go to #7b.
- 7b. Are you sure? Did Paco tell you a secret and say not to tell?
If yes, praise child (Now your memory is better.) and go to #8.
If no, act disappointed (I thought you would remember.) and go to #8.
8. Did Paco throw a crayon at a kid who was talking?
If yes, praise child (Good job.) and go to #9.
If no, act disappointed (I was hoping you could help.) and go to #8b
- 8b. Are you sure? Did Paco throw a crayon?
If yes, praise child (Now your memory is better.) and go to #9.
If no, act disappointed (Maybe your memory isn't very good today.) and go to #9.
9. Did Paco put on goofy glasses?
If yes, praise child (Good job.) and go to #10.
If no, act disappointed (I was hoping you could help.) and go to #9b.
- 9b. Are you sure? Did Paco put on goofy glasses?
If yes, praise child (Now your memory is better.) and go to #10.
If no, act disappointed (I thought you would remember.) and go to #10.
10. Did Paco say a bad word?
If yes, praise child (Good job.) and go to #11.
If no, act disappointed (I was hoping you could help.) and go to #10b.
- 10b. Are you sure? Did Paco say a bad word?
If yes, praise child (Now your memory is better.) and go to #11.
If no, act disappointed (Maybe your memory isn't very good today.) and go to #11.
11. Did Paco kiss you on the nose?
If yes, praise child (Good job.) and go to #12.
If no, act disappointed (I was hoping you could help.) and go to #11b.
- 11b. Are you sure? Did Paco kiss you on the nose?
If yes, praise child (Now your memory is better.) and go to #12.
If no, act disappointed (I thought you would remember.) and go to #12.
12. Did Paco put a sticker on your hand?
If yes, praise child (Good job.) and go to #13.
If no, act disappointed (I was hoping you could help.) and go to #12b.
- 12b. Are you sure? Did Paco put a sticker on your hand?
If yes, praise child (Now your memory is better.) and go to #13.
If no, act disappointed (Maybe your memory isn't very good today.) and go to #13.
13. Did Paco take you on a helicopter ride?
If yes, praise child (Good job.) and go to #14.
If no, act disappointed (I was hoping you could help.) and go to #13b.

- 13b. Are you sure? Did Paco take you on a helicopter ride?
If yes, praise child (Now your memory is better.) and go to #14.
If no, act disappointed (I thought you would remember.) and go to #14.
14. Did Paco take you to a farm?
If yes, praise child (Good job.) and go to #15.
If no, act disappointed (I was hoping you could help.) and go to #14b.
- 14b. Are you sure? Did Paco take you to a farm?
If yes, praise child (Now your memory is better.) and go to #15.
If no, act disappointed (Maybe your memory isn't very good today.) and go to #15.
15. Did you see animals on the farm?
If yes, praise child (Good job.) and go to #16.
If no, act disappointed (I was hoping you could help.) and go to #15b.
- 15b. Are you sure? Did you see animals on the farm?
If yes, praise child (Now your memory is better.) and go to #16.
If no, act disappointed (I thought you would remember.) and go to #16.
16. Did Paco take you on a horse ride?
If yes, praise child (Good job.) and thank the child for his/her help.
If no, act disappointed (I was hoping you could help.) and go to #16b.
- 16b. Are you sure? Did Paco take you on a horse ride?
If yes, praise child (Now your memory is better.) and thank the child for his/her help.
If no, act disappointed (Maybe your memory isn't very good today.) and thank the child for his/her help.

Appendix D. The Digit Span Task

"We're going to play a fun game that involves memory. Do you have a good memory?" (*Response*). "Would you like to play this game with me?" (*Response*). "I'm glad you want to play because this is really going to be fun!"

"First I want you to listen to me as I say some numbers. Try to remember each number that I am saying because I'm going to ask you to say the numbers back to me. Are you ready to listen to the numbers?" (*Response*).

Practice Trials:

"Let's practice first. Listen to me say these numbers and then when I tell you, say the numbers back to me."

1. 5 - 7 - 4

"O.K. Now, say the numbers back to me." (*Response. If incorrect, repeat rules and do practice trial again*). (*When correct*) "Very good!"

Test Trials:

"O.K., let's play the game!" (*Numbers are read at a rate of one item per second. The span length begins at two. Every time a child repeats the numbers correctly in the exact order, the span length is increased by one. If the child recalls the span incorrectly, a different digit span of the same span length is repeated. If the child fails the second span, the testing session is finished*).

Scoring:

The maximum span length is the score on this measure. Check the box if the level was completed successfully

TRIAL	FIRST SPAN	SECOND SPAN	COMPLETED
1	5, 2	8, 6	
2	3, 9, 6	7, 3, 1	
3	6, 8, 9, 1	4, 6, 3, 7	
4	2, 8, 5, 4, 7	3, 1, 0, 8, 2	
5	0, 2, 7, 3, 6, 4	8, 5, 2, 9, 4, 0	
6	2, 7, 8, 3, 6, 9, 1	3, 6, 0, 2, 6, 8, 3	
7	4, 7, 2, 8, 4, 5, 1, 0	3, 2, 7, 4, 0, 9, 7, 8	
8	1, 7, 9, 2, 7, 9, 3, 2, 4	4, 2, 3, 9, 7, 2, 9, 8, 1	
9	5, 8, 9, 3, 5, 1, 1, 2, 8, 4	4, 3, 6, 7, 6, 4, 1, 0, 9, 8	
10	0, 1, 7, 4, 3, 8, 2, 3, 1, 9, 5	5, 9, 1, 3, 7, 6, 9, 2, 4, 8, 9	

Feedback:

"Thanks for playing the game! I hope you had fun! You did really well!"

HIGHEST LEVEL COMPLETED: _____

Appendix E. Young Children's Social Desirability Scale

1. Do you sometimes play with toys? Or do you never play with toys?
2. Do you always play by yourself? Or do you sometimes play with other children?
3. Do you sometimes argue with your mother? Or do you never argue with your mother?
4. Are you always polite to older people? Or are you sometimes not polite to older people?
5. Do you never shout when you feel angry? Or do you sometimes shout when you feel angry?
6. Do you sometimes tell a little lie? Or do you never tell a little lie?
7. Do you sometimes hit another boy or girl? Or do you never hit another boy or girl?
8. Do you always help people? Or do you sometimes not help people?
9. Do you never show off to your friends? Or do you sometimes show off to your friends?
10. Do you sometimes say mean things to people? Or do you never say mean things to people?
11. Do you sometimes feel like throwing or breaking things? Or do you never feel like throwing or breaking things?
12. Do you feel that your parents are always right? Or do you sometimes feel that your parents are not always right?
13. Do you never act naughty? Or do you sometimes act naughty?
14. Do you sometimes do other things instead of what your teacher tells you to do? Or do you always do what your teacher tells you to do?
15. Do you sometimes do things you're not supposed to do? Or do you never do things that you're not supposed to do?
16. Do you think your teachers know more than you do? Or do you think you know more than your teacher does?
17. Do you sometimes want things your parents don't want you to have? Or do you never want things your parents don't want you to have?
18. Does it sometimes bother you when you don't get your way? Or does it never bother you when you don't get your way?
19. Do you always listen to your parents? Or do you sometimes not listen to your parents?
20. Do you always wash your hands before every meal? Or do you sometimes not wash your hands before every meal?
21. Do you never feel like making fun of other people? Or do you sometimes feel like making fun of other people?
22. Do you sometimes forget to say "please" and "thank you"? Or do you never forget to say "please" and "thank you"?
23. Does it sometimes bother you to share things with your friends? Or does it never bother you to share things with your friends?
24. Do you sometimes want to do things your parents tell you not to do? Or do you never want to do things your parents tell you not to do?

Appendix F. Paco Free Recall Interview

Each child will be asked the following questions:

- 1) Tell me about things you like to do.
- 2) Tell me more about [activity the child has mentioned. AVOID TV, VIDEOS, & FANTASY].
- 3) I really want to know more about things that happen to you. Tell me everything that happened yesterday, from the time you got to school to the time you left school.
- 4) Do you remember when Paco Perez visited your school?
- 5) Tell me everything you remember about Paco's visit.
- 6) What else happened?
- 7) Tell me about what Paco did with the balloon/
- 8) Tell me about what Paco did with the can.
- 9) What good things did Paco do?
- 10) What bad things did Paco do?
- 11) What happened when Paco took you outside?

Appendix G. Children's Social Desirability Questionnaire

1. Do you ever get angry if you have to stop in the middle of something you're doing to eat dinner or go to school?
2. Does it sometimes bother you to share your things with your friends?
3. Do you always enjoy yourself at a party?
4. Are you always polite to older people?
5. Do you sometimes tell a little lie?
6. Do you ever hit a boy or girl who is smaller than you?
7. Sometimes do you feel like doing other things instead of what your teacher wants you to do?
8. Do you ever act "fresh" or "talk back" to your mother or father?
9. When you make a mistake, do you always admit you are wrong?
10. Do you feel that your parents always show good judgment; that is, do they always make good choices?
11. Have you ever felt like saying unkind things to a person?
12. Have you sometimes felt like throwing or breaking things?
13. Do you ever let someone else get blamed for what you do wrong?
14. Do you sometimes brag to your friends about what you can do?
15. Are you always careful about keeping your clothing neat and your room picked up?
16. Do you ever shout when you feel angry?
17. Do you sometimes feel like staying home from school even if you're not sick?
18. Sometimes, do you wish your parents didn't check up on you so closely?
19. Do you always help people who need help?
20. Do you sometimes argue with your mother to let you do something she doesn't want you to do?
21. Do you ever say anything that makes somebody else feel bad?
22. Do you think your teachers know more about everything than you do?
23. Are you always polite, even to people who are not very nice?
24. Sometimes, do you do things you've been told not to do?
25. Do you ever get angry
26. Do you sometimes want to own things just because your friends have them?
27. Do you always listen to your parents?
28. Do you ever forget to say "please" and "thank you"?
29. Do you sometimes wish you could just play around instead of having to go to school?
30. Do you always wash your hands before every meal?
31. Do you sometimes dislike helping your parents even though you know they need your help around the house?
32. Do you ever find it hard to make friends?
33. Have you ever broken a rule?
34. Sometimes, do you try to get even when someone does something to you that you don't like?
35. Do you sometimes feel angry when you don't get your way?
36. Do you always help a hurt animal?
37. Do you sometimes want to do things your parents think you are too young to do?
38. Do you sometimes feel like making fun of other people?

39. Have you ever borrowed anything without asking permission first?
40. Do you sometimes get mad when someone disturbs something you've been working on?
41. Are you always glad to cooperate with others?
42. Do you ever get angry when your best friend wants to do something you don't want to do?
43. Do you sometimes wish that the other kids would pay more attention to what you say?
44. Do you always do the right thing?
45. Are there some times when you don't like to do what your parents tell you? (mind your parents?)
46. Are there times that you don't like it if somebody asks you to do something for him?
47. Do you sometimes get mad when people don't do what you want them to do?

Curriculum Vita

Elizabeth Uhl was born in Harvey, Illinois. She graduated from Marian Catholic High School in May of 2001. Elizabeth began school at Bradley University in Peoria, Illinois the following fall where she pursued a bachelor's of science degree in psychology, administration of criminal justice, and sociology. While at Bradley she had the opportunity to intern at the Center for Prevention of Abuse and the Peoria County Clerk's Office. During her time at Bradley, she also had the opportunity to study for a semester at American University in Washington D.C., where she studied criminal justice, and for a year at the University of Nebraska – Lincoln, where she studied legal psychology. While in D.C. she interned at the National Center for Missing and Exploited Children. Elizabeth graduated from Bradley University in May of 2006. That fall she entered the Graduate School at The University of Texas at El Paso and she earned her M.A. in Psychology in 2008. After completing her Ph.D., Elizabeth will join the faculty at Georgia Southwestern State University as an Assistant Professor of Psychology in the fall of 2011.

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