

UC Berkeley

Berkeley Undergraduate Journal

Title

Reducing Suggestibility in Preschool Children through Developing Intuitions of Free Will

Permalink

<https://escholarship.org/uc/item/9z3622n2>

Journal

Berkeley Undergraduate Journal, 26(2)

Author

Libin, Gabriella Ruth

Publication Date

2013

DOI

10.5070/B3262018158

Copyright Information

Copyright 2013 by the author(s). All rights reserved unless otherwise indicated. Contact the author(s) for any necessary permissions. Learn more at <https://escholarship.org/terms>

Peer reviewed|Undergraduate

REDUCING SUGGESTIBILITY IN PRESCHOOL CHILDREN THROUGH DEVELOPING INTUITIONS OF FREE WILL

By Gabriella Libin

The current study investigated preschool-aged children's understanding of their own free will capacities to choose whether to believe or not believe information from an informant. Specifically, we investigated the potential relationship between children's intuition of their own free will, and their ability to produce accurate testimony in light of a suggestive interviewer. 48 three- to five-year-old children participated in the study with two tasks. In the first task, children listened to a scenario, and responded to an interviewer's questions regarding if they had to believe what they were told in the scenario, or if they could choose to believe that something else might be true. The second task was adapted from the Giles and Gopnik procedure.¹ The children watched a video and then were asked suggestive questions regarding what they had just watched in the video. Children's understanding of choice in regard to belief was highly correlated with their ability to resist suggestion. The results indicated that preschool-aged children develop an understanding of free will in regards to how they conceptualize belief. Furthermore, children with a more developed conception of their own free will capacities are able to produce more accurate eyewitness testimonies and are better able to resist the suggestive nature of biased interviewers.

Keywords: child development, free will, testimony, suggestibility, theory of mind

¹ Giles, J.W., Gopnik, A., & Heyman, G.D. (2002). Source monitoring reduces the suggestibility of preschool children. *Psychological Science, 13*(3), 288-291.

I. Introduction

Imagine you are at a court hearing and a four-year-old child walks up to the witness stand to testify in front of the court. Would you believe the child? Does a four-year-old child have the cognitive capacity to accurately recall a past event? It is well known in the field of child development, as well as in the legal field, that children have difficulty providing accurate testimony for many reasons. Children face multiple roadblocks and challenges when it comes to providing accurate testimony about an eyewitness event. In particular, children are suggestible— they will often accept the implicit claims of interviewers and this leads them to change their perceptions and beliefs about eyewitness events.

In the 1991 trial the *People of the State of California vs. Dale Akiki*, a volunteer babysitter at the Faith Chapel Church preschool in San Diego, California was charged with child sexual and satanic ritual abuse. The case drew serious attention regarding the testimony provided by the children on the stand. Dale Akiki, the volunteer babysitter, was arrested and charged with 35 counts of child abuse and kidnapping, however, there was no physical evidence presented at trial, only allegations and testimony.¹ After a nine-month trial, the jury found Dale Akiki not guilty, notwithstanding the fact that he had been held in jail for two-and-a-half years without bail.² One of Akiki's defense attorneys, Kate Coyne, pointed out parents' suggestiveness during the trial, commenting that "a mother started questioning her daughter in an 'intensely suggestive manner' until sexual-abuse accusations came forth."³ The trial included the testimony of children who at the time of the alleged abuse were three or four years old, but at the time of the trial were around seven years old. The testimony from over 50 children included accusations of Dale Akiki hanging children upside down from a chandelier, killing animals in front of the children, drinking human blood in satanic rituals, kidnapping children, bringing elephants to class, and killing a human baby.⁴ As the trial went on, it was concluded that the allegations were likely false and were the byproduct of suggestive parents and interviewers and weak memory recall in the children involved. In a seven-hour decision the jury rendered a verdict of not guilty on all charges. After the conclusion of the case, Dale Akiki sued the County of San Diego, the Children's Hospital, and the therapists who allegedly "brainwashed" the children through their interviewing practices.⁵

The investigations preceding the Akiki trial followed by the McMartin Preschool case that took place in Los Angeles, California in the 1980s. The McMartin family operated a preschool and subsequently were charged with numerous acts of child sexual abuse. The investigation took six years, and although charges were finally dropped in 1990, it was the longest and most expensive criminal trial in American history to date.⁶ During the McMartin case, the Children's Institute International of Los Angeles interviewed hundreds of children who had attended the McMartin

1 People of the State of California vs. Dale Akiki, No. CR122381 (S.D. Ca. May 31, 1991)

2 Mydans, S. (1994, June 3). Prosecutors rebuked in molestation case. *The New York Times*. Retrieved from <http://www.nytimes.com/1994/06/03/us/prosecutorsrebuked-in-molestation-case.html>

3 Dickey, F. (2012, May 9). Akiki reflects on historic trial. *The San Diego Union-Tribune*. Retrieved from <http://www.utsandiego.com/news/2012/may/09/dale-akiki-reflects-historic-molestation-trial>

4 Mydans, S. (1994, June 3). Prosecutors rebuked in molestation case. *The New York Times*. Retrieved from <http://www.nytimes.com/1994/06/03/us/prosecutorsrebuked-in-molestation-case.html>

5 Lee, A. (Director). (2009). *A Modern With Hunt: The Dale Akiki Story*. [Documentary]. Available from <http://vimeo.com/5325479>

6 Reinhold, R. (1990, January 24). The longest trial- a post mortem; collapse of child-abuse case: so much agony for so little. *The New York Times*. Retrieved from <http://www.nytimes.com/1990/01/24/us/longest-trial-post-mortem-collapse-child-abuse-case-so-much-agony-for-so-little.html>

Preschool and made accusations against the McMartin family. The interviewing techniques during the investigation were found to be highly suggestive and to encourage the children to pretend or speculate about the events in question.⁷

Studies have since been conducted to investigate the suggestive interviewing that took place during the trial. Researchers analyzed the interview transcripts between the psychologists and the children in the case and found that, in contrast to the Child Protective Services' guidelines for interview techniques, the interviews techniques used in the McMartin trial were inclined to produce fabrication.⁸ The interviewers made suggestive statements to the interviewees, provided praise and positive reinforcement, expressed disapproval or disagreement with children, exerted conformity pressure, and encouraged children to pretend about supposed events. Additionally, researchers have since analyzed the transcripts of the McMartin trial for the presence of "simple suggestive questions" in order to compare the effects of the McMartin interviewing technique on children's testimony. To make this comparison, researchers interviewed 36 children with the McMartin techniques and 30 children with "simple suggestive questions." The study found that 58% of children interviewed with the McMartin techniques made accusations, while only 17% of children interviewed with "simple suggestive questions" did so.⁹ In sum, the techniques used in the McMartin trial were found to be highly suggestive, to encourage children to conform to an interviewer's suggestions, and to lead children to potentially change their testimony. As demonstrated by both the Akiki and the McMartin Preschool trials, preschool-aged children are not consistent in providing accurate testimony, and their inability to provide an accurate report of an eyewitness event can have devastating repercussions for those against whom they are testifying.

Findings in the developmental psychology literature support the idea that preschoolers are suggestible, as both the Akiki and McMartin trials made apparent. In a study examining differences in eyewitness testimony, three-year-olds, six-year-olds, and adults interacted with an unfamiliar man for five minutes, and five days later were interviewed about what happened. The study found that adults and six-year-olds could answer objective questions and identify the confederate accurately, though the six-year-olds were more suggestible than the adults. However, the three-year-olds answered a significant number of objective questions incorrectly, recalled little about the event, and often identified an incorrect confederate.¹⁰ The findings from this study are profound because the researchers identified developmental stages in children's testimony abilities. The results suggest that preschool-aged children have not yet developed the ability to effectively recall an eyewitness event.

Overall, it has been established in the field that preschool-aged children are easily suggestible and lack the cognitive ability to produce reliable eyewitness testimony. Unfortunately, attorneys use this information to their advantage in the courtroom. Researchers who interviewed attorneys about children's testimonies found that a majority

7 Reinhold, R. (1990, January 24). The longest trial- a post mortem; collapse of child-abuse case: so much agony for so little. *The New York Times*. Retrieved from <http://www.nytimes.com/1990/01/24/us/longest-trial-post-mortem-collapse-child-abuse-case-so-much-agony-for-so-little.html>

8 Schreiber, N., Bellah, L.D., Martinez, Y., McLaurin, K.A., Strok, R., Garven, S., & Wood, J.M. (2006). Suggestive interviewing in the McMartin preschool and Kelly Michael's daycare abuse cases: A case study. *Social Influence, 1*(1), 16-47.

9 Garven, S., Wood, J.M., Malpass, R.S., & Shaw, J.S. (1998). More than suggestion. The effect of interviewing techniques from the McMartin preschool case. *Journal of Applied Psychology, 83*(3), 347-359.

10 Goodman, G.S., & Reed, R.S. (1986). Age differences in eyewitness testimony. *Law and Human Behavior, 10*(4), 317-332. Johnson, M.K., Hashtroudi, S., & Lindsay, D.S. (1993). Source monitoring. *Psychology Bulletin, 114*(1), 3-28.

admitted to using these widely recognized vulnerabilities in preschool-aged children to portray them as unreliable for the benefit of their clients. Additionally, they discovered that often an attorney's techniques and interviewing practices have harmful effects on the validity of children's testimony.¹¹ The *Cornell Law Review* reported results that two-thirds of defense attorneys reported that they "often" or "always" use children's vulnerabilities in the courtroom to their advantage during cross-examinations.¹² Further reports showed that defense attorneys admitted to using intimidation as a tactic to scare children to be silent in the courtroom.¹³

Aside from the practices of attorneys, there are many additional ways that children can be misled through interviewing techniques. Specifically, researchers have discovered that misleading suggestions by interviewers can cause children to respond in a manner that they believe is consistent with the interviewer's beliefs.¹⁴ Further research has shown that simple mistakes by interviewers such as suggesting a specific interpretation, asking a child for verification, and speaking unclearly can cause children to change their responses because they feel the interviewer wants them to respond in a different manner.¹⁵ Additionally, interviewers who are confident have been found to be suggestive in nature. Studies have shown that children are sensitive to accuracy from informants with confidence, and they use statements of confidence as shortcuts when deciding the worth of informants.¹⁶ Further setbacks for children in providing accurate testimony stem from their memory capabilities. Limited memory capabilities in children hinder retrieval patterns for accessing information for accurate recall, and post-event information has been found to affect the original memory trace.¹⁷

Researchers have been successful in identifying the problems preschool-aged children face in providing reliable eyewitness testimony, and as a result have been eager for a solution to this problem. Solution proposals include modifying interviewing techniques and practicing clarity in questioning. Research has concluded that clarity from an interviewer is crucial for children to understand what is being asked without being misled. The way questions are asked is important as well because tone, suggestions, and body language can signal to children that the interviewer wants them to respond in a certain manner.¹⁸ As a result, children pick up on this and respond in agreement. A successful tactic created to help children improve their recall for eyewitness events and avoid suggestion is training them to say "I don't know" when asked a question to which they do not know the answer.¹⁹ This method was found to be successful because often when children do not know the answer, or are unsure of what to say, they will simply agree with the interviewer in an attempt to please them. However, this in turn produces inaccurate testimony of the event from the child. Other suggestions to help increase accuracy included modifying questioning

11 Lyon, T. (1999). The new wave in children's suggestibility research: A critique. *Cornell Law Review*, 84, 1004-1087.

12 Lyon, T. (1999). The new wave in children's suggestibility research: A critique. *Cornell Law Review*, 84, 1004-1087.

13 Montoya, J. (1995). Lessons from Akiki and Michaels on shielding child witnesses. *Psychology, Public Policy and Law*, 78(1) 340-351.

14 Bruck, M., Ceci, S. J. & Principe, G. F. (2007). The child and the law. In Reninger, K.A., & Lerner, R. (Eds.), *Handbook of child psychology*. Hoboken, NJ: Wiley.

15 Poole, D.A., & Lamb, M.E. (1998). *Investigative interviews of children: A guide for helping professionals*. Washington, DC: American Psychological Association.

16 Tenney, E.R., Small, J.E., Kondrad, R.L., Jaswal, V.K., & Spellman, B.A. (2011). Accuracy, confidence, and calibration: How young children and adults assess credibility. *Developmental Psychology*, 47(4), 1065-1077.

17 Ceci, S.J., Ross, D.F., & Toglia, M.P. (1987). Suggestibility of children's memory: psycholegal implications. *Journal of Experimental Psychology*, 116(1), 38-49.

18 Bruck, M., Ceci, S. J. & Principe, G. F. (2007). The child and the law. In Reninger, K.A., & Lerner, R. (Eds.), *Handbook of child psychology*. Hoboken, NJ: Wiley.

19 Nesbitt, M., & Markham, R. (1999). Improving young children's accuracy of recall for an eyewitness event. *Journal of Applied Developmental Psychology*, 20(3), 449-459.

techniques from being suggestive in nature to being open-ended, which helps eliminate some of the potential for interviewers to suggest a specific interpretation of an event.²⁰

Researchers have identified additional techniques in order to facilitate more effective memory recall in preschool-aged children. Deficits in recall are prevalent in the testimony literature. Researchers have recognized that children are capable of remembering facts and events, but children have trouble remembering how and where they learned them.²¹ Additionally, children demonstrate a severe problem in identifying the source of their information, but researchers have found causal clues to help children increase accessibility.²²

In order to ameliorate these deficits in preschool-aged children's memory recall, numerous studies have identified source monitoring as an effective tool. Source monitoring is the cognitive ability to identify and monitor the origin of a specific memory trace for an individual.²³ If children can identify the origins of their memories, it can help them determine if their information came from an eyewitness event or elsewhere. In a study of source monitoring and suggestibility, source monitoring performance was correlated to a child's ability to resist suggestion.²⁴ It was demonstrated through this study that source monitoring has a causal role in reducing suggestibility in three- and four-year-old children. Additionally, training studies have taught children that people can be misleading as a tool to help them reduce suggestibility through source monitoring.²⁵ Furthermore, after training three- and four-year-olds on source monitoring techniques, researchers found that children could transfer the source monitoring knowledge to events that happened in the past, allowing them to accurately answer misleading yes-no and open ended questions.²⁶

The theory of mind literature has attempted to identify additional tactics to help children produce accurate testimony. Researchers wondered if preschool-aged children are suggestive because they do not yet understand that their own thoughts and memories may differ from the thoughts and memories of other people. Theory of mind is the ability for children to consider the perspective of another as well as understand that other people have different thoughts, knowledge, and beliefs than they do.²⁷ Findings assessed that theory of mind is essential for a child's ability to have multi-representative thinking, meaning that he or she can take on multiple views. Without the ability to take multiple perspectives, children can encounter a misinformation effect. A misinformation effect occurs when misinformation biases an individual's recollection of his or her own memories, and this can interfere with children's original memory trace. In theory, when children have theory of mind capacities, they would have an understanding of what knowledge is their own independent from what knowledge other people can access. Without having theory

20 Powell, M.B. (2004). *Improving the reliability of child witness testimony in court: The importance of focusing on questioning techniques*. Paper presented at the AIJA Child Witness- Best Practices for courts' seminar, District Court of New South Wales.

21 Pilon, F.M. (2004). *Improving preschoolers' memories for the sources of events: A comparison of two source-monitoring training techniques* (Unpublished master's thesis). Wilfrid Laurier University, Ontario.

22 Ackerman, B.P. (1992). The sources of children's source errors in causal inferences. *Journal of Experimental Child Psychology*, 54(1), 90-119.

23 Johnson, M.K., Hashtroudi, S., & Lindsay, D.S. (1993). Source monitoring. *Psychology Bulletin*, 114(1), 3-28.

24 Giles, J.W., Gopnik, A., & Heyman, G.D. (2002). Source monitoring reduces the suggestibility of preschool children. *Psychological Science*, 13(3), 288-291.

25 Nesbitt, M., & Markham, R. (1999). Improving young children's accuracy of recall for an eyewitness event. *Journal of Applied Developmental Psychology*, 20(3), 449-459.

26 Thierry, K.L., & Spence, M.J. (2002). Source-monitoring training facilitates preschoolers' eyewitness memory performance. *Developmental Psychology*, 38(3), 428-437.

27 Wellman, H.M. & Liu, D. (2004). Scaling of theory-of-mind tasks. *Child Development*, 75(2), 523-541.

of mind capabilities, researchers believe that children may not have the representational thinking necessary to avoid misinformation effects.²⁸

In addition to identifying techniques to help children accurately testify, researchers have been interested in what factors children rely on when choosing which conflicting source to believe. Children's causal inference from testimony has been studied in the testimony and cognitive development literature in order to understand which sources of information children rely on in producing their own testimonies.²⁹ Results showed that preschool-aged children are sensitive to accuracy from an informant and are likely to trust an informant who makes accurate claims about an object or event at hand.³⁰ When children were told to listen to testimony from an informant, children tended to trust the informant who acted knowledgeably and told them that she was "certain she was right" about her claim. When an informant was naïve and told the participant that she was "unsure if her testimony was right" the participant was less likely to endorse her suggestion. However, after being presented with data showing the participant that the knowledgeable informant was in fact incorrect about her claims, the participant was seemingly less likely to trust the knowledgeable informant afterwards. However, children were forgiving when the knowledgeable yet incorrect informant presented a completely new object about which to make claims. Researchers believe that preschool-aged children are somewhat forgiving of incorrect informants when presented with new stimuli. Bridgers et al.'s study showed that children's causal learning from testimony taps into the informant's certainty about an event, past accuracy, and self-knowledge. Researchers found that these tactics were effective tools children use to determine an informant's credibility. The perception of credibility would affect children's resulting suggestibility.

In sum, the immense body of literature on the testimony abilities of preschool-aged children shows that they in fact have a difficult time differentiating the sources of their information in providing accurate testimony. Preschool-aged children tend to be extremely suggestible, and the practices of suggestive interviewers can be detrimental to the validity of children's testimony. Using the background research on testimony and suggestibility, the current study set out to examine which factors may inhibit accuracy or may help children have more accurate recall. The present literature identified that source monitoring and theory of mind have positive effects on increasing accuracy in testimony. The current study sought to identify what other techniques and cognitive abilities may be useful in helping children reduce suggestibility and provide accurate testimony.

Additionally, two of the goals of the present study were to identify why children are testifying incorrectly and how their understanding of beliefs may affect their ability to resist suggestions. Are children suggestive because they believe that they have to agree with an interviewer's perspective on an event, regardless of whether the perspective differs from their own? We know from the testimony literature that children conform to an interviewer's bias when interviewers repeat questions, ask specific questions as opposed to open-ended questions, and

28 Templeton, L.M., & Wilcox, S.A. (2000). A tale of two representations: The misinformation effect and children's developing theory of mind. *Child Development*, 71(2), 402-416.

29 Bridgers, S., Buchsbaum, D., Seiver, E., Gopnik, A., & Griffiths, T.L. (2011, October). *Which block is better at making the machine go?: How children balance their trust in an informant vs. the data*. Poster presented at biennial meeting of the cognitive development society, Philadelphia.

30 Buchsbaum, D., Bridgers, S., Whalen, A., Seiver, E., Griffiths, T.L., & Gopnik, A. (2012, August). *Do I know that you know what you know? Modeling testimony in causal inference*. Paper presented at the 34th annual conference of cognitive science society, Japan.

suggest a specific bias.³¹ These interview biases can lead children to interpret that the interviewer wants them to respond consistently with the interviewer's beliefs, and in turn children respond with compliance. Considering this literature, it does seem likely that children feel forced to comply with an interviewer's biases and that children do not feel comfortable choosing to assert their own views.

However, the researchers in the present study were curious why these interview biases lead children to conform to such lengths. Are children actually changing their beliefs? Or, perhaps, are children just changing what they are saying in order to please an interviewer and respond in a manner that they believe the interviewer wants? Specifically, we were interested in whether children think they actually have a choice to say what they believe, or if they perceived they no longer have a choice at all when faced with suggestive interview biases.

Psychologists have studied children's understanding of choice and the findings suggest that older infants have the cognitive capacity to understand that people have different preferences than they do and thus may make different choices.³² However, in a study by Kushnir, Chernyak, Seiver, Gopnik, and Wellman, the researchers explored children's perceptions of the limits on people's choices. They found that at a young age, children are capable of understanding constraints on choice. Specifically, the study found that children understand that you cannot choose to do an action if it is physically impossible.³³ However, the study also found that children feel more conflicted about choice when it interferes with their own desires. Overall, developmental findings identified that four-year-olds understand choice when desire is neutral and the decision does not require inhibition of a preference. Moreover, by age six, children have the capacity to understand that choice can prevail over their own desires in deciding behavior even if they have a strong inclination toward their desire. In sum, as children become older, they understand that despite their desires and wants, they can "choose to" do a less desirable behavior because of their understanding that they have free will and choice.

Although researchers identified that preschool-aged children can distinguish freedom from constraint, younger children continue to be conflicted about the idea of free will when it contrasts with their own personal desires. The idea behind free will is that we have the power to act, think, or believe through our personal choice and autonomy. Although there is an extensive body of literature on how adults reason about their personal capacity for free will, there has been little work conducted on understanding free will in children. However, the Kushnir et al. study has started to create a foundation in studying the developing intuitions of free will in children. The study identified developmental trends in free will specifically in regards to acting against one's own desire, and found that six-year-olds have developed the understanding that they have freedom to act against their own desires.³⁴ In sum, the Kushnir study identified that children understand that they do not have a choice when it comes to doing physically impossible tasks, but that young children are conflicted about choice when it inhibits their own desires. However, how much free will do children think they have with respect to believing other people's thoughts and suggestions?

31 Bruck, M., Ceci, S. J. & Principe, G. F. (2007). The child and the law. In Reninger, K.A., & Lerner, R. (Eds.), *Handbook of child psychology*. Hoboken, NJ: Wiley.

32 Repacholi, B.M., & Gopnik, A. (1997). Early reasoning about desires: Evidence from 14- and 18-month-olds. *Developmental Psychology*, 33(1), 12-21.

33 Kushnir, K., Chernyak, N., Seiver, E., Gopnik, A., & Wellman, H.M (In prep). Developing intuitions about free will between ages four and six. *Child Development*, Manuscript submitted for publication.

34 Kushnir, K., Chernyak, N., Seiver, E., Gopnik, A., & Wellman, H.M (In prep). Developing intuitions about free will between ages four and six. *Child Development*, Manuscript submitted for publication.

With the knowledge the Kushnir et al. study provides us on the developing intuitions of free will in four- and six-year-old children, would these developmental patterns exist for free will in children with respect to beliefs? When testifying in the courtroom, how much free will do children feel they have to say what they want to say or to think what they want to think? Do preschool-aged children lack the free will to proclaim their own views, attitudes, and beliefs about eyewitness events? As a result, do they feel as though they are unable to go against the suggestions of an adult interviewer? These questions led the researchers to consider children's conception of their own free will in respect to beliefs as a potential factor in hindering children's ability to produce accurate testimony. Without an understanding of their own free will and ability to believe what they wish, how can children stress their own individual thoughts while they are encouraged to answer in a specific manner?

The present study explores the question of whether understanding free will with respect to beliefs can help children to understand that they can “choose to” respond to an interviewer in the manner that they believe is right instead of “having to” respond in consistency with suggestive and biased questions. The present study hypothesized that children who have intuition of their own “free will” will have the ability to act against the suggestion of others and provide accurate testimony because they have the cognitive ability to believe that they can answer in the manner they desire. Using a Free Will measure modeled after Kushnir et al.³⁵ and a Suggestibility task modeled after Giles and Gopnik,³⁶ the current study will measure whether children's conception of their own free will has a positive role in helping children reduce suggestibility in order to provide accurate testimony of an eyewitness event. Additionally, the researchers hypothesized that a priming effect would be present in the study. We hypothesized that first doing a task in which children address their views on free will would prime children of their own free will capacity and increase their ability to resist suggestion on a later task.

II. Methods

A. Participants

Participants were 48 children (22 girls, 26 boys; $M = 4.34$, Range = 3.03 - 5.9) recruited from local preschools and science museums. Out of the 48 children, one participant's responses were excluded from the final data set because of exclusion criteria. In a Suggestibility task, 47 out of 48 participants answered all of the “control” questions correctly, so the one participant who did not answer the control questions correctly was excluded. After children watched a video, the children were asked control questions about the events they had just witnessed. The “control” questions were suggestive of events that had in fact taken place, for example, “The boys were playing catch with a baseball, weren't they?” Because this in fact took place in the video, if a child answered this incorrectly, it seemed as though he or she was not paying attention or was unable to absorb what took place during the duration of the video. Due to exclusion criteria, the study had a final sample of 47 children who were randomly assigned to three different conditions, which were counterbalanced by order. The participating children were recruited from Monteverde

35 Kushnir, K., Chernyak, N., Seiver, E., Gopnik, A., & Wellman, H.M (In prep). Developing intuitions about free will between ages four and six. *Child Development*, Manuscript submitted for publication.

36 Giles, J.W., Gopnik, A., & Heyman, G.D. (2002). Source monitoring reduces the suggestibility of preschool children. *Psychological Science*, 13(3), 288-291.

TABLE 1
 COUNTERBALANCED TASK TYPE AND TASK ORDER.
 TABLE 1 DEMONSTRATES THE THREE POSSIBLE
 CONDITIONS PARTICIPANTS WERE RANDOMLY ASSIGNED.

Condition 1
1 st task–Free Will task
2 nd task–Suggestibility task
Condition 2
1 st task–Suggestibility task
2 nd task–Free Will task
Control Condition
1 st task–Theory of Mind Control task
2 nd task–Suggestibility Task

Preschool, The Berkeley School, and the Lawrence Hall of Science. All of the above sites work in collaboration with the University of California, Berkeley’s Institute of Human Development within the Psychology Department.

B. Procedure

The experiment began with a Theory of Mind pre-training task, which included two tasks taken directly from Wellman and Liu’s “Scaling of Theory of Mind Tasks.”³⁷ This served as a warm-up exercise aiming to help children become comfortable with the experimenter and experimental setting before the experimental tasks. After the Theory of Mind pre-training task, the experiment involved two experimental tasks: the Free Will task and the Suggestibility task. Children were randomly assigned to three conditions. In Condition 1, children first completed the Free Will task followed by the Suggestibility task. In Condition 2, children first completed the Suggestibility task followed by the Free Will task. Task order manipulation was used in the current study to assess whether or not completing the Free Will task first would prime children by making them more aware of their own free will capacity and would help them resist suggestion in the later Suggestibility task. A Control Condition was developed to ensure that if the study found a significant effect of completing the Free Will task prior to the Suggestibility task, we could conclude that it was due to the Free Will task itself, and was not a byproduct of the child becoming more comfortable with the experimenter and/or testing environment or of simply improving performance on a later task. The Control Condition mirrored the structure of Condition 1 in that the Suggestibility task occurred second in order to compare the differences in Suggestibility scores dependent on which task came first. However, in the Control Condition, an additional Theory of Mind task taken directly from Wellman and Liu was used in place of the Free Will task.

37 Wellman, H.M. & Liu, D. (2004). Scaling of theory-of-mind tasks. *Child Development*, 75(2), 523-541.

C. *Materials*

The experiment involved one experimenter and the participant and was videotaped for coding. Materials used for the Theory of Mind pre-training task included two small dolls named Bobby and Josie, pictures of a living room and kitchen, a small box, and a little bell. In the Free Will task, materials included a doll named Sally, a small box, paperclips, drawings of a park and bedroom, and two toy boxes and a bouncy ball. In the Suggestibility task, the only material used was a video shown on a laptop computer. In the Theory of Mind task for the Control Condition, materials included four small dolls named Johnny, Jenny, Peter, and Teddy; a box of cookies; pictures of a closet, backpack, carrot, and cookie; rocks; a box of band aids; and a toy pig.

D. *Theory of Mind Pre-Training*

The present study always began with two Theory of Mind pre-trainings, which came prior to the Free Will task and the Suggestibility task regardless of which condition the child was randomly assigned. The first Theory of Mind task used in the study was the Diverse Beliefs task. In the Diverse Beliefs task, the experimenter placed in front of the child a drawing of a living room and a drawing of a kitchen. The experimenter brought out a small toy man and said, "Here comes Bobby. Bobby wants to find his puppy. His puppy might be hiding in the kitchen or it might be hiding in the living room. Where do you think the puppy is? In the kitchen or in the living room?" This question is the own-desire question, and the experimenter waited for the child to answer his or her own-desire response. If the child answered "the living room," the experimenter responded, "Well, that's a good idea, but Bobby thinks his puppy is in the kitchen." (Or, if the child answered "kitchen," he or she was told Bobby thinks his puppy is in the living room.) Then, the experimenter asked the Theory of Mind target question, "So where would Bobby look for his puppy?" To pass Theory of Mind on this task, the child had to answer the target question opposite from his or her answer to the own-belief question.

The second Theory of Mind task used in the study was the Knowledge Access task. In this task, the experimenter placed a small box in front of the child and said, "Here is a box. What do you think is inside the box?" The child then could answer whatever he or she thought was inside the box, or could say that he or she did not know. The experimenter then opened the box, showed the child its contents, and said, "Let's see what is inside . . . it's really a shiny bell!" Next, the experimenter brought out a toy girl and asked the target question, "Josie has never seen inside this box. Now here comes Josie. So, does Josie know what is inside this box?" The experimenter then followed with the memory question, "Did Josie see inside this box?" To pass this task, the child must have answered 'no' to both the target question and the memory questions.

E. *Tasks*

i. Free Will Task

Prior to beginning the Free Will task, children were pre-trained using two physical possibility questions and two physical impossibility questions. Pre-training was used to ensure that children understood free will and the concept of choice. The physical possibility and physical impossibility

questions were taken directly from Kushnir et al.³⁸ The physical possibility questions asked were, “If you really wanted to, could you just choose to wave your hand?” and “If you really wanted to, could you just choose to jump up and down?” The physical impossibility questions asked were, “If you really wanted to, could you just choose to run faster than a train?” and “If you really wanted to, could you just choose to turn invisible?”

After the experimenter trained the child in the pre-training questions, she introduced the child to a toy doll named Sally. The experimenter told the child, “Sally is a kid just like you!” in order to encourage the child to view Sally as a real person with thoughts, feelings, and ideas just like him or her. In the Free Will task, there were four scenarios that were used as measures to collect four data points on children’s intuitions of their own free will in regard to belief. In each of the four scenarios, the experimenter presented an object or situation to the child and explained Sally’s view of the object or situation. For example, in the first Free Will question the experimenter presented the child with a box and said, “Look at this pretty box Sally has! Sally thinks there are marbles inside this box; she told you she is absolutely sure there are marbles inside. But remember you have never seen inside this box before.” After the experimenter presented the child with the object and told the child Sally’s thoughts about it, the experimenter then asked the child the Choice Question. The Choice Question measures the child’s intuition of his or her own free will with respect to belief and if he or she has to believe Sally, or if he or she can choose to believe that something else may be true. The study’s incorporation of “Choice Questions” was derived from Kushnir et al. “Developing Intuitions About Free Will Between Ages Four and Six”.³⁹ Choice Questions are phrased as such for the future tense: “Can you choose to do X, or do you have to do Y?” or the counterbalanced phrasing, “Do you have to do X, or can you choose to do Y?” In the above example from the first Free Will scenario, after presenting Sally’s view on what was inside the box, the experimenter would then ask the Choice Question, “Do you have to think that there are marbles inside this box because Sally said so, or can you choose to not think there are marbles inside?”

After asking the Choice Question, the experimenter then revealed that in fact Sally was incorrect about the situation or object. In the above example, after asking the Choice Question the experimenter would then open the box, show the participant that the box actually contained paperclips, and say, “Look there are actually paperclips inside this box!” For the Free Will task there were four scenarios similar to the above example, and each was followed by an appropriate Choice Question (See Table 2). The orders of the four scenarios were counterbalanced during the study. The Free Will measure asked children if they could “choose to” or “have to” think certain things or take certain actions and asked why they felt that way. In order to be certain that participants understood the task, each child’s response was followed by the verifying question, “Why do you think that?” to ensure that he or she understood the question at hand.

38 Kushnir, K., Chernyak, N., Seiver, E., Gopnik, A., & Wellman, H.M (In prep). Developing intuitions about free will between ages four and six. *Child Development*, Manuscript submitted for publication.

39 Kushnir, K., Chernyak, N., Seiver, E., Gopnik, A., & Wellman, H.M (In prep). Developing intuitions about free will between ages four and six. *Child Development*, Manuscript submitted for publication.

TABLE 2
EACH OF THE FOUR SCENARIOS AND
QUESTIONS IN THE FREE WILL TASK

	<i>Scenario</i>	<i>Sally's Belief</i>	<i>Choice Question</i>	<i>Reality</i>
Free Will Question 1	Sally presents a small box to the child.	Sally thinks there are marbles inside.	Experimenter: "Do you have to think there are marbles inside, because Sally said so, or can you choose to not think there are marbles inside?"	Experimenter: "Oh look, there are actually paperclips inside this box!"
Free Will Question 2	Sally hides cookies in her bedroom, and Sally wants you to find the cookies.	Sally says that she always hides cookies in the closet.	Experimenter: "Do you have to open the closet to look for the cookies, because Sally said so, or can you choose to look somewhere else first?"	Experimenter: "Oh look, the cookies are actually under the bed!"
Free Will Question 3	Sally wants to go to the park and needs to go the quickest route.	Sally tells you that the fastest way to go to the park is around the school and through a gate in a brick wall.	Experimenter: "Do you have to listen to Sally and go around the school and through the gate, because Sally said so, or can you choose to go a different way?"	Experimenter: "Oh look, there is no gate in the brick wall after all, so it would be faster to go a different way."
Free Will Question 4	Sally presents two toy boxes to the child, one that is black and one that is white. Sally loves her toys, and her bouncy ball toy is her favorite. She wants the child to find it.	Sally says the bouncy ball is in the black toy box.	Experimenter: "Do you have to open the black toy box to find the bouncy ball toy, because Sally said so, or can you choose to open the white toy box?"	Experimenter: "Oh look, the bouncy ball toy was actually in the white toy box!"

ii. Suggestibility Task

The Suggestibility task was adapted from Giles and Gopnik's "Source Monitoring Reduces the Suggestibility of Preschool Children."⁴⁰ Adjustments were made from the original study including a different video and different questions. However, the overall structure and methodology was identical to the original study. This task was used to assess the child's ability to resist suggestion when providing eyewitness testimony, even after being presented with leading and suggestive questions. In the task, the child was first shown a one-minute video of a family playing outside of their house. In the video, two boys play catch with a baseball, a girl rides by on a pink scooter, a

⁴⁰ Giles, J.W., Gopnik, A., & Heyman, G.D. (2002). Source monitoring reduces the suggestibility of preschool children. *Psychological Science*, 13(3), 288-291.

TABLE 3
SUGGESTIVE QUESTIONS FROM THE
SUGGESTIBILITY TASK

	<i>Question</i>	<i>False or True</i>
Suggestibility Question 1	The girl was riding a bicycle, wasn't she?	False (she was riding a scooter)
Suggestibility Question 2	There was a tree in the yard, wasn't there?	True
Suggestibility Question 3	The car that drove by was white, wasn't it?	True
Suggestibility Question 4	The dog had black fur, didn't it?	False (the dog had light brown/golden fur)
Suggestibility Question 5	The two boys were playing catch with a baseball, weren't they?	True
Suggestibility Question 6	The boys hit the house with the baseball, didn't they?	False (the boys never hit the house with a baseball)

white car drives by, and the children play with their dog. The experimenter narrated along with the video to ensure that the child was aware of what took place in the video. After watching the video, the experimenter said a declarative phrase followed by a question asking for agreement with what had just been stated in the declarative phrase (e.g. "The car that drove by was white, wasn't it?"). The experimenter asked the participant six declarative phrases followed by leading questions, all regarding information that the child heard and saw in the video (See Table 3). Three of the declarative statements contained erroneous information, and three of them provided accurate information. The order of the six questions were counterbalanced during the study. Performance on this task was a dependent variable in the study and was measured on a score of 0–6. A score of 6 indicated accurate responses to all suggestive questions.

iii. Theory of Mind Control Condition

The Theory of Mind Control Condition was structured to be as close as possible to the structure of the Free Will task in that it had the same number of scenarios (four) and was identical in duration. The tasks were taken directly from Wellman and Liu's "Scaling of Theory of Mind Tasks,"⁴¹ and since two of the tasks were used previously as a pre-training exercise in the current study, four additional tasks were used for the Control Condition. The tasks taken from Wellman and Liu were the Diverse Desires task, Explicit False Belief task, Contents False Belief task, and Belief-Emotion task. The orders of the four tasks were counterbalanced during the study.

Originally, this condition was meant to serve as a placeholder for the order effect manipulation. However, the data collected from this task enabled the experimenters to look at the relationship between theory of mind and suggestibility as well. With this in mind, the task was scored similarly to the Free Will task. Each of the four Theory of Mind questions within the

41 Wellman, H.M. & Liu, D. (2004). Scaling of theory-of-mind tasks. *Child Development*, 75(2), 523-541.

task were scored on a scale of 0–1, 0 constituting a failing score and 1 a passing score. Since there were four Theory of Mind questions, participants in the Control Condition could have a Theory of Mind score ranging from 0 to 4.

In performing the diverse desires task, the experimenter presented the child with a toy doll named Johnny, and told the child, “Here is Johnny: Johnny really wants a snack to eat! Here are two different snacks: a carrot and a cookie.” The experimenter then asked the own desire question, “Which snack would you like best? A cookie or a carrot?” If the child answered “cookie,” the experimenter responded, “Well that’s a good choice, but Johnny really likes carrots. He doesn’t like cookies.” However, if the child answered “carrot,” the experimenter told the child that Johnny likes cookies and not carrots. The target question is, “So now it is time to eat, and Johnny can only choose one snack. Which snack will Johnny choose?” To pass the task, the child must have answered the target question opposite of the own desire question.

The second task was the explicit false belief task, in which the experimenter presented a toy doll named Jenny to the child and said, “Jenny wants to find her mittens! They might be in her backpack or they might be in the closet. *Really*, Jenny’s mittens are in her backpack, but Jenny *thinks* her mittens are in the closet.” Then the experimenter asked the target question, “So, where will Jenny look for her mittens? In her backpack or in the closet?” This was followed by the reality question, “Where are Jenny’s mittens really? In her backpack or in the closet?” In order to pass the task, the child must have answered the target question “closet” and the reality question “backpack.”

For the contents false belief task the experimenter presented the child with a Band-Aid box and said, “Here is a Band-Aid box. What do you think is inside the Band-Aid box?” After the child responded the experimenter opened the box to reveal a toy pig. The experimenter then said, “It is really a pig inside!” Next, the experimenter took out a toy doll and said, “Here comes Peter! Peter has never seen inside the Band-Aid box.” The experimenter followed with the target question, “What does Peter think is inside the box? Band-Aids or a pig?” The child passed the task if he or she answered the target question as “Band-Aids.”

In the belief-emotion task, the experimenter presented the child with a cookie box and a toy doll named Teddy and said, “Here is a cookie box and here is Teddy. What do you think is inside the cookie box?” After the child responded “cookies,” the experimenter said, “Teddy says, ‘Oh good, because I love cookies! Cookies are my favorite snack!’” After putting Teddy under the table, the experimenter then opened the cookie box to reveal that there were actually rocks inside and no cookies. The experimenter then brought back Teddy from under the table and said, “Teddy has never seen inside this box. Now here comes Teddy. Teddy’s back and it is snack time! Let’s give Teddy this box. So, how does Teddy feel when he gets this box?” The target question followed, “Does Teddy feel happy or sad?” After this, the experimenter opened the box, let Teddy look inside the box, and asked the emotion control question, “How does Teddy feel after he looks inside the box? Happy or sad?” In order to pass this task, the child must have answered the target question “happy” and the emotion control question “sad.”

F. Measures

The measures of primary interest were the child’s scores in the Free Will task and Suggestibility task, and the order effects of performing the Free Will task prior to the Suggestibility task. All three conditions were used to assess order effects in statistical analysis. For the Free Will task, the participants were scored on a 0–1 scale, 0 for every “have to” answer and 1 for every “choose to”

answer. The final score was out of 4 points, and participants were analyzed categorically based on their Free Will score. In the Suggestibility task, each declarative phrase and suggestive question was scored on accuracy. For the suggestive false phrases (e.g., “The girl was riding a bicycle, wasn’t she?” when she was actually riding a scooter), the child was scored on whether or not he or she was able to resist the suggestibility and answer the question correctly. If the child answered “yes” this was scored as a “false positive,” but if the child answered “no” this was scored as a “correct negative,” meaning that they correctly identified that the statement was incorrect and resisted the suggestible phrase. In the control phrases (e.g., “The car that drove by was white, wasn’t it?” when the car was in fact white), the child was scored on accuracy. If the child answered “yes” it was scored as a hit, and if the child answered “no” it was scored as a miss. In numerically scoring for the Suggestibility task, each “false positive” answer on the suggestive phrases was given a score of 0, and each “correct negative” was given a score of 1. On the control phrases, a “hit” was given a score of 1, and a “miss” was given a score of 0. The total accuracy was out of 6, but suggestibility averages were scored out of 3.

Participants in the Control Condition were given a score for the Suggestibility task out of 6 points just as in the Experimental Conditions. In our analysis, we looked at the differences between the two experimental conditions by analyzing and comparing the averages of the Free Will scores and Suggestibility scores of the two conditions to look for significant differences between conditions. Statistical analysis was also completed using the measures from the Theory of Mind Control task in comparison with children’s Suggestibility scores.

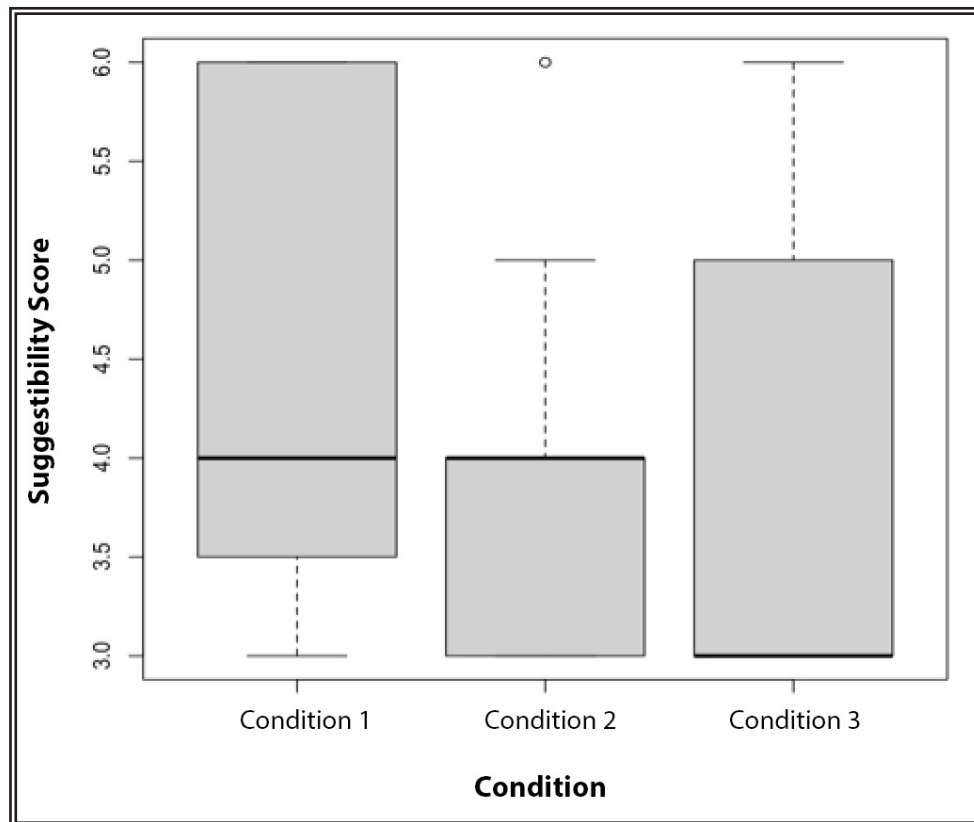
G. Statistical Analyses

An analysis of covariance (ANCOVA) was used to analyze the dependent variable of Suggestibility score with the factors of Condition and Free Will score. The ANCOVA was also used to see if the mean of the Suggestibility scores was equal across levels of the conditions depending on the order/condition. These analyses focused on the average Suggestibility scores comparatively for the conditions to see if there was in fact a significant effect in the average Suggestibility score if the Free Will task was done before or after the Suggestibility task.

Analysis also looked at the overall trend and effect of Free Will conception and Suggestibility scores for participants. Multiple linear regressions were conducted to look at the following relationships: Suggestibility and Free Will, Free Will and age, Suggestibility and age, and Suggestibility and Theory of Mind. Further analysis conducted included an ANCOVA with the dependent variable of Suggestibility with the factors of Theory of Mind and age.

Lastly, order effects were taken into consideration on the Free Will questions to see if there were significant differences in the mean of the responses for the first, second, third, and fourth questions asked in the Free Will portion of the experiment. T-test analyses were conducted to identify any of these potential significant differences in children’s responses. The t-tests were employed to identify if children responded differently on their first Free Will question from their last Free Will question. All analyses were performed on R commander version 2.1.5.1 (2012-06-22).

FIGURE 1
ORDER EFFECTS-CONDITION TYPE
COMPARED TO SUGGESTIBILITY SCORE IN
THE SUGGESTIBILITY TASK



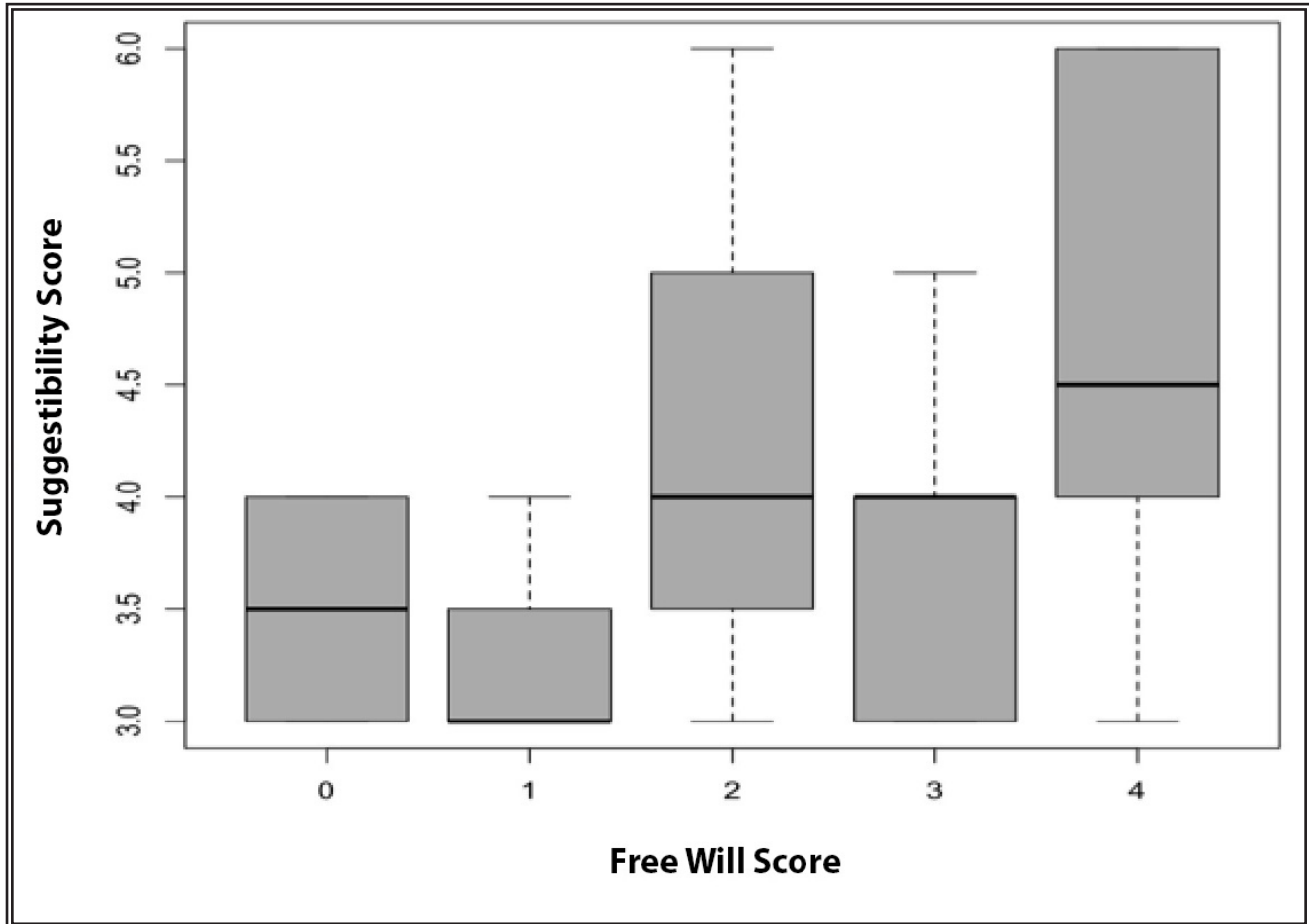
Graph of condition and their respective average Suggestibility scores. The conditions are categorically compared to the average Suggestibility scores for participants in each of the randomly assigned conditions. The study found no significant differences based on which conditions participants were assigned.

III. Results

In order to investigate the effect of Free Will and condition on Suggestibility scores, we used an ANCOVA. The ANCOVA was significant ($F(3,28) = 3.68, p = .024$). Post hoc tests showed there was no main effect of condition on Suggestibility scores ($t(29) = 0.587, p = .562$). However, there was a significant main effect of Free Will on Suggestibility scores ($t(29) = 2.701, p = .0116$).

We were concerned about the effect of age on the relationship between the significant main effect of Free Will score and Suggestibility. In order to further investigate this we sought to partial out age as a variable to see the remaining relationship between Free Will and Suggestibility. In an ANCOVA with Free Will as the dependent variable and Suggestibility score and age as main effects, the ANCOVA was significant ($F(3,28) = 7.80, p = .0006$). Post hoc tests showed that there were additionally significant main effects of both Suggestibility score ($t(29)=2.13, p = .042$) and

FIGURE 2
RELATIONSHIP BETWEEN FREE WILL
SCORES AND SUGGESTIBILITY SCORES



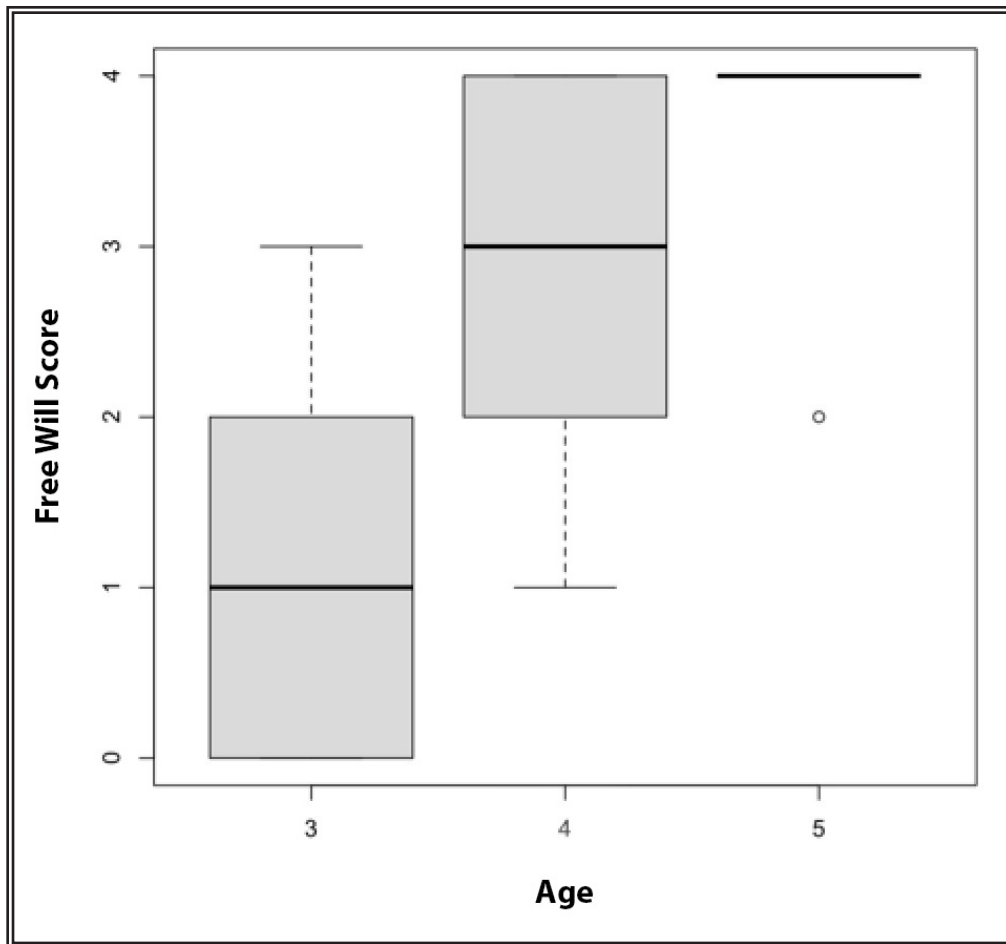
Graph showing Suggestibility as function of Free Will scores. The y-axis represents the Suggestibility scores for participants and the x-axis represents the Free Will numerical score in five categories (0–4). The graph shows the correlation between higher Free Will scores and higher Suggestibility score.

age ($t(29) = 2.77, p = .0099$) on Free Will scores. The analysis suggests that even when age as a factors taken out of the statistical analysis, a significant relationship still exists between the subjects' Suggestibility scores and Free Will scores. In order to further analyze the relationship between both suggestibility and free will as a developmental trend, we performed linear regressions on Suggestibility score and age, and Free Will score and age. The linear regression for Free Will and age was highly significant ($F(1,30) = 16.44, p = .0003$), and the linear regression for Suggestibility and age was also highly significant ($F(1,30) = 19.09, p = 7.26e^{-05}$).

T-test calculations were performed in order to identify potential differences in children's responses to the Free Will task. The researchers were interested in whether children use the deterministic data from the unknowledgeable informant and change their "choose to" and

FIGURE 3

FREE WILL SCORES AND AGE

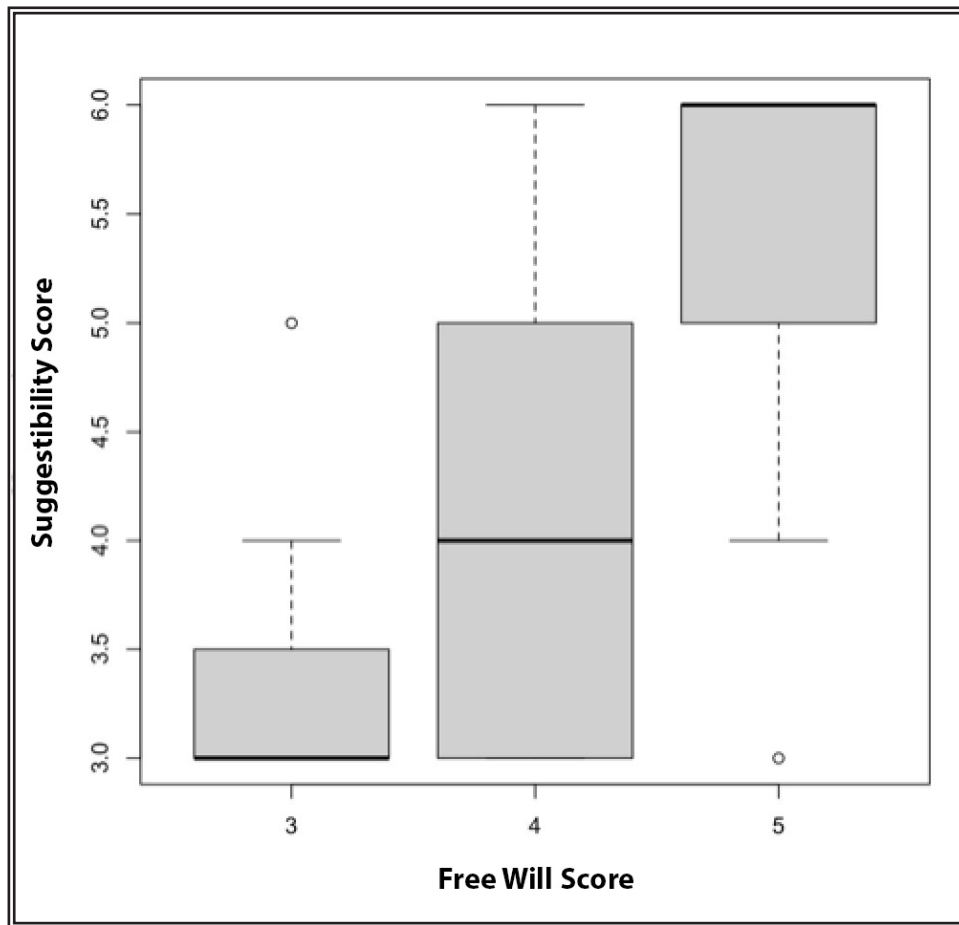


Graph depicting the relationship between Free Will score and age. Data is shown categorically by age on the x-axis for three-, four-, and five-year-old participants.

“have to” responses after receiving feedback that their informant is consistently incorrect. T-test analyses suggest that there were no significant differences between children’s responses between the first and fourth Free Will question they answered ($t(31) = -1, p = .325$).

Lastly, researchers were interested in the Theory of Mind data collected in the Control Condition, and whether a relationship exists between Suggestibility and Theory of Mind. An ANCOVA with the dependent variable of Suggestibility and main effects of Theory of Mind and age was designed to evaluate the relationship. The ANCOVA was significant ($F(2,12) = 8.52, p = .005$), but after Post hoc tests, we identified that the significant ANCOVA was due to the significant main effect of age ($t(13) = 2.168, p = .05$). The post hoc tests identified that Theory of Mind was not a significant effect on Suggestibility ($t(13) = 1.97, p = .073$).

FIGURE 4
SUGGESTIBILITY SCORES AND AGE



Graph depicting the relationship between Suggestibility score and age. Data is shown categorically by age on the x-axis for three-, four-, and five-year-old participants.

IV. Discussion

The results of the study identified a significant relationship between children's intuition of free will and their ability to resist suggestion. However, order effects and priming were not significant in the current study. Without significant order effects, the researchers can reject the hypothesis that thinking about free will is enough to inform children of their own free will capacity, thereby enabling them to resist suggestion from a biased interviewer. Nonetheless, due to the significant correlation between the ability to resist suggestion and children's awareness of their ability to choose whether to believe an informant, the researchers do believe that a developmental relationship exists between the two cognitive abilities. Additionally, significant age effects confirm prior research that has noted developmental trends in both suggestibility and children's intuition of free will.

A. *Age Effects*

The results of the experiment showed significant main effects of age for both suggestibility and children's intuition of free will when deciding what to believe. The significant age effects for conception of one's own free will confirm developmental trends between three and five years of age, which supports previous findings that suggested developmental trends in free will and choice with respect to desire.⁴² Additionally, results suggest significant age effects on the ability to resist suggestion. This finding supports prior research that has argued that younger preschool-aged children between three and four years of age are significantly more likely to be influenced by suggestion than older preschool-aged children between five and six years of age.⁴³ Due to the significant relationship between age and suggestibility, the substantial relationship between age and free will, and the significant literature on both of these topics, we can confirm these likely developmental trends in preschool-aged children.

B. *Free Will*

The findings in the current study can elaborate how children perceive and conceptualize their own free will abilities in regards to their understanding of their own beliefs. Prior to the current study, the literature on free will in children provided us with an understanding of how children reason about free will in regards to desire and how this develops between ages four to six. Kushnir et al.'s study found that six-year-old children understand that they can choose to act against their own desires; however, four-year-old children do not have this conception of free will in regards to inhibiting desire. These findings support developmental trends of preschool-aged children's intuition of free will. The current study not only supports the idea of developmental differences in free will, but can also elaborate on how free will develops in children with respect to conceptualizing free will with an emphasis on understanding belief.

The results suggest that as children develop throughout the preschool years, they begin with a minimal understanding that they can reject beliefs other than their own. Yet, by about five years of age, they have little difficulty disregarding a belief from an informant regardless of its merit because they have the autonomy to believe whatever they want. When the experimenter asked a five-year-old participant in the current study if she had to believe what Sally said or if she could choose to believe that something else might be true, she always answered that she could choose to believe something else could be true. When the experimenter then asked why she felt that way, she simply responded, "Because you want to!" In the study, five-year-old children had a significantly more developed understanding that they did not have to believe information from an outside source and that they could think or believe whatever they chose.

C. *Theory of Mind*

The results of the study suggest that there is not a significant relationship between children's ability to resist suggestion and their theory of mind representational thinking. This finding is interesting for several of reasons. First, we know that theory of mind is a crucial cognitive development in

42 Kushnir, K., Chernyak, N., Seiver, E., Gopnik, A., & Wellman, H.M (In prep). Developing intuitions about free will between ages four and six. *Child Development*, Manuscript submitted for publication.

43 Ceci, S.J., & Huffman, M.C. (1997). How suggestible are preschool children? Cognitive and social factors. *Journal of the American Academy of Child & Adolescent Psychiatry*, 36(7), 948-958.

children because it helps them understand other people's mental states.⁴⁴ Since theory of mind was not related to the ability to resist suggestion, we interpret these results as suggesting that theory of mind, or having the ability to understand other people's thoughts and mental states, does not help children reduce the suggestive nature of suggestible interviewers. These results are also interesting because they contradict research claiming that without having theory of mind, children would not have the representational thinking skills to avoid misinformation effects, which decrease children's testimony accuracy.⁴⁵ These results suggest that the cognitive capacity to comprehend the fact that others have different thoughts, feelings, and beliefs is not an underlying mechanism in resisting suggestion.

D. Order Effects

The current study hypothesized that priming children on free will would increase their ability to resist suggestion. This prediction assumed that significant order effects would then be present in the study, and that the participants in the condition in which the Free Will task came before the Suggestibility task (Condition 1) would have higher scores in the Suggestibility task as an effect of priming. Since order effects were null in the study, it provides us with the understanding that there is no causal relationship between understandings of free will and belief, and the ability to resist suggestion. Therefore, it does not matter if children are primed on free will or if they think about their own free will prior to being interviewed on an eyewitness event. It seems as though children's conception of free will and choice and their ability to reduce suggestion are independent of influence from one another.

The study found a significant relationship between a child's conception of his or her own free will and the child's ability to provide accurate testimony despite suggestive interviewing practices. Due to this result, we postulate that there does exist a relationship between the two despite a lack of causal interaction. Children who have a more developed understanding of their own free will in regards to beliefs were also found to have a much higher sense of the ability to reduce suggestion. The findings are possibly an effect of age, but also likely an effect of a relationship between free will and understanding that they have the ability to provide testimony of their "choice" regardless of what an interviewer might be suggesting.

In sum, due to significant effects of age in the study, and the significant relationship between children's understanding of free will and their ability to resist suggestion, we are inclined to believe that there does exist a mechanism that causes the two abilities to develop simultaneously in children. It seems as though children improve in their ability to resist suggestion from biased interviewing and develop a more formal understanding of free will in regards to belief on a similar timeframe between the ages of three to five years.

E. Free Will and Suggestibility

In evaluating the significant relationship between children's understanding of free will and their ability to resist suggestion, we were curious as to what mechanisms could be causing these two different cognitive abilities to develop in relation to each other. Thus, we considered the underlying

44 Wellman, H.M. & Liu, D. (2004). Scaling of theory-of-mind tasks. *Child Development*, 75(2), 523-541.

45 Templeton, L.M., & Wilcox, S.A. (2000). A tale of two representations: The misinformation effect and children's developing theory of mind. *Child Development*, 71(2), 402-416.

similarities between understanding free will and belief, and the ability to resist suggestion. With the following similarities in mind, the correlation between a child's understanding of free will and his or her own ability to provide testimony in response to suggestible questions seems plausible for a few reasons.

The first similarity between the Free Will task and the Suggestibility task that we considered was that in both the child was faced with making decisions about an informant's beliefs. In the Free Will task, children were asked if they had to believe an informant's assumption about an object or event. This caused children to provide insight on how they reason about believing or not believing an informant's opinion. Here, children with an understanding of choice and free will responded by saying that they could choose to believe something else and that they did not have to agree with Sally's account of the object or event. In sum, they articulated the idea that they did not have to follow an interviewer's direction. A similarity within the two tasks exists here between children's ability to answer that they "did not have to listen to Sally and do what she says" and their ability to disregard a suggestion from an interviewer. The Free Will task was indirectly testing if the children felt compelled to take the data from the informant as fact regardless of whether or not they personally had an eyewitness account or knowledge of the event. If children in the Free Will task answered the choice question by responding that they "have to listen to Sally," they identified their negligible sense of free will and identified the feeling of compulsion to go along with what they heard. They also identified their tendency to side with an informant's view regardless of the informant's lack of knowledge.

Since the results of the study did show this significant correlation between conceptions of free will and suggestibility, we found that the children who felt they "had to listen to Sally" were more likely to be easily influenced and answered the Suggestibility task questions with the answer suggested by the experimenter. Additionally, the children who said that they "could choose to not listen to Sally" were also able to identify when the experimenter was being suggestive of false information and were able to resist the suggestion and answer with the correct response.

The second similarity we considered was the idea of choice. When children are asked suggestive questions, they can either choose to side with the suggestion from the informant regardless of whether they think it is correct, or they can disregard the opinion and make an independent decision. Children who do not understand free will and choice would likely have a challenging time when faced with the choice of resisting suggestion or conforming to an interviewer's belief, as they do not yet conceptualize that they are capable of free will. Specifically, with respect to belief, if children do not understand that they can choose to disbelieve other people's perspectives, then disregarding suggestions would pose a difficult task for young children. Having intuitions about belief and an understanding that one can make decisions to believe what one wants is a helpful tool for resisting suggestion. Children can use their understanding of diverse beliefs and free will when faced with the choice of whether to agree with an interviewer who suggests interpretations that differ from their own.

Therefore, it seems as though the cognitive ability to understand choice is an underlying mechanism behind why children who have a conception of free will are able to choose not to conform to specific suggestions from interviewers. This shows the possible connection between a child's conception of free will and his or her ability to resist suggestive information in providing testimony. It seems possible that the relationship between free will of one's own beliefs and the giving of testimony is profound in that children use their conception of their own free will abilities to understand that they have the capacity to believe what they want, and further, that they do not need to adhere to another person's contrasting views on a situation.

F. *Stability in Free Will*

In the Free Will task we used four questions to gain the measure of a child's intuition of his or her own free will. During this task, Sally presented her view on a scenario each time, and the child then answered whether or not he or she had to believe Sally. After this, we showed the child that Sally was in fact wrong. In this condition, children were presented with deterministic data after each trial that showed that Sally was an unknowledgeable informant. However, interestingly for this condition, children did not show an effect of changing their free will responses in response to this data. The t-test results showed no significant differences between the "choose to" versus "have to" answers from the first, second, third, or fourth free will questions. This means that children did not significantly change their views on their ability to believe or disbelieve Sally because she was an unknowledgeable informant.

These results support findings from Bridgers et al.,⁴⁶ which was discussed at length in the introduction of this paper. In the study, children were presented with testimony from an informant who acted confident and knowledgeable. However, children were then presented with data that the informant was in fact incorrect. Despite the informant's past inaccuracy, the children tended to side with the informant's testimony, and forgive her for being incorrect in the past. In the present study and the Bridgers study, children demonstrated that they do not use the data of an informant's inaccuracy when choosing what testimony to believe. The stability in children's responses despite evidence against the informant suggests that children will continue to side with an incorrect informant despite learning that they were incorrect. Children who initially believed they had the autonomy to choose to believe something different than the informant suggested might be true continue to feel as though they have a choice in what to believe. Moreover, children who feel compelled to believe the informant, despite their inaccuracy, will continue to conform to the informant's biases.

G. *Limitations and Future Directions*

In determining the limitations of the current study, we again used the Bridgers et al. paper to incorporate an important consideration for future research. In the Bridgers study, after the informant provided her testimony regarding which block she endorsed to make a machine work, she left the testing room. This allowed for the experimenter to ask the child which block the child wanted to endorse without the informant present. Having the informant leave the room was an important consideration for the study because it ensured that the child did not feel pressured to conform his or her answer to please the informant.

In the current study, a potential limitation could be that the experimenter left the Sally doll out on the table when questioning children about whether or not they had to believe Sally. At the beginning of the experiment, we asked children to believe that Sally was a real child just like them. From research in pretend play, we know how important pretend play is to children between the ages of three and five, and that children are able to attribute a pretense over the physical reality in order to create a mentally represented alternative, which enables them to play

46 Bridgers, S., Buchsbaum, D., Seiver, E., Gopnik, A., & Griffiths, T.L. (2011, October). *Which block is better at making the machine go?: How children balance their trust in an informant vs. the data*. Poster presented at biennial meeting of the cognitive development society, Philadelphia.

along.⁴⁷ The literature on pretend play allows us to conclude that since three- to five-year-old children are in a “high season” of pretend play, they are able to use their skills to pretend that the Sally doll is a real person just like them when instructed in the experiment.⁴⁸

With what we know about children and pretend play, we can assume that if the children were pretending Sally was a real person, they might want to conform their answer in an attempt not to upset or disagree with the doll while she was still on the table in front of them. The Bridgers et al. study was sure to have the informant leave the room before the experimenter asked if the child was going to endorse the suggestion of the informant or not.⁴⁹ A potential limitation of the current study could be that we did not consider the role of pretend play in children and the possible effect of leaving the Sally doll on the table while asking the choice questions.

Future directions and research ideas include completing the study with a Free Will task condition in which the Sally doll is consistently correct about her suggestions as opposed to being incorrect in the current study. It would be interesting to see if there are significant differences in how children interpret data that indicated that Sally is consistently a knowledgeable and accurate informant. We would be interested to see how this deterministic data might alter children’s conception of their own free will. Additionally, we would like to do the experimental Free Will task with a probabilistic condition as opposed to the present study’s deterministic design. We are interested in how children would attribute this probabilistic data from an informant who is correct $\frac{1}{4}$ of the time, yet incorrect about their suggestions $\frac{3}{4}$ of the time. It would be illuminating to investigate how children’s perceptions of their own free will would be altered by these new experimental designs in manipulating deterministic and probabilistic conditions as well as accuracy versus inaccuracy.

H. Implications

The present study found significant results that support what the psychology and legal fields know regarding the development of testimony abilities in children. From the McMartin Preschool and Akiki trials, we have seen the devastating real-world effects of the inaccurate testimony of preschool-aged children. Children’s inability to resist suggestion, avoid a misinformation effect, and accurately recall past events has led to the wrongful arrests and imprisonments of innocent people. The McMartin Preschool and Akiki trials exemplify the dire need to solve the reality that preschool-aged children are incapable of providing consistently accurate eyewitness testimony at the stand. Without addressing this issue, we face the possibility that more people will be arrested due to false reports from children. Since we know that preschool-aged children are highly suggestible, the fields of both psychology and law are eager for a solution to help make children’s testimony valuable in a courtroom as opposed to destructive.

The results of the current study have significant implications for the legal field and for encouraging reliability in the courtroom. We are now aware that children who understand free

47 Lillard, A.S., Lerner, M.D., Hopkins, E.J., Dore, R.A., Smith, E.D., & Palmquist, C.M. (2013). The impact of pretend play on children’s development: A review of the evidence. *Psychological Bulletin*, 139(1), 1-34.

48 Singer, D.G., & Singer, J.L. (1992). *The house of make believe: Children’s play and the developing imagination*. Cambridge, MA: Harvard University Press.

49 Bridgers, S., Buchsbaum, D., Seiver, E., Gopnik, A., & Griffiths, T.L. (2011, October). *Which block is better at making the machine go?: How children balance their trust in an informant vs. the data*. Poster presented at biennial meeting of the cognitive development society, Philadelphia.

will and choice, especially with respect to belief, are significantly more successful at producing accurate testimony due to their cognitive awareness that they can choose to believe and think what they want. The present study found significant results that suggest a strong relationship between children who understand free will and choice, and those children's ability to resist suggestion and produce highly accurate testimony of an eyewitness event. Legal professionals and therapists who prepare children for the courtroom can use these findings to their benefit. Professionals can help train children on free will and choice and can explain that they do not need to feel compelled to believe anyone other than themselves. Furthermore, professionals can take into consideration that children who lack the ability to understand choice and resist suggestion will likely provide testimony that is highly inaccurate and a byproduct of multiple suggestive adults and interviewers. The study found that children who have intuition about their own free will with respect to belief and understand that they have choice are able to resist suggestion and produce highly accurate accounts of an eyewitness event. These findings provide insight on a cognitive ability that can assist accurate testimony in children, and hopefully can be applied to the legal field to ensure that only reliable and highly accurate testimony is considered in a courtroom.

Bibliography

- Ackerman, B.P. (1992). The sources of children's source errors in causal inferences. *Journal of Experimental Child Psychology*, 54(1), 90-119.
- Bridgers, S., Buchsbaum, D., Seiver, E., Gopnik, A., & Griffiths, T.L. (2011, October). *Which block is better at making the machine go?: How children balance their trust in an informant vs. the data*. Poster presented at biennial meeting of the cognitive development society, Philadelphia.
- Bruck, M., Ceci, S. J. & Principe, G. F. (2007). The child and the law. In Reninger, K.A., & Lerner, R. (Eds.), *Handbook of child psychology*. Hoboken, NJ: Wiley.
- Buchsbaum, D., Bridgers, S., Whalen, A., Seiver, E., Griffiths, T.L., & Gopnik, A. (2012, August). *Do I know that you know what you know? Modeling testimony in causal inference*. Paper presented at the 34th annual conference of cognitive science society, Japan.
- Ceci, S.J., & Huffman, M.C. (1997). How suggestible are preschool children? Cognitive and social factors. *Journal of the American Academy of Child & Adolescent Psychiatry*, 36(7), 948-958.
- Ceci, S.J., Ross, D.F., & Toglia, M.P. (1987). Suggestibility of children's memory: psycholegal implications. *Journal of Experimental Psychology*, 116(1), 38-49.
- Dickey, F. (2012, May 9). Akiki reflects on historic trial. *The San Diego Union-Tribune*. Retrieved from <http://www.utsandiego.com/news/2012/may/09/dale-akiki-reflects-historic-molestation-trial>.
- Garven, S., Wood, J.M., Malpass, R.S., & Shaw, J.S. (1998). More than suggestion. The effect of interviewing techniques from the McMartin preschool case. *Journal of Applied Psychology*, 83(3), 347-359.
- Giles, J.W., Gopnik, A., & Heyman, G.D. (2002). Source monitoring reduces the suggestibility of preschool children. *Psychological Science*, 13(3), 288-291.

- Goodman, G.S., & Reed, R.S. (1986). Age differences in eyewitness testimony. *Law and Human Behavior, 10*(4), 317-332.
- Johnson, M.K., Hashtroudi, S., & Lindsay, D.S. (1993). Source monitoring. *Psychology Bulletin, 114*(1), 3-28.
- Kushnir, K., Chernyak, N., Seiver, E., Gopnik, A., & Wellman, H.M. (In prep). Developing intuitions about free will between ages four and six. *Child Development*, Manuscript submitted for publication.
- Lee, A. (Director). (2009). *A Modern With Hunt: The Dale Akiki Story*. [Documentary]. Available from <http://vimeo.com/5325479>
- Lillard, A.S., Lerner, M.D., Hopkins, E.J., Dore, R.A., Smith, E.D., & Palmquist, C.M. (2013). The impact of pretend play on children's development: A review of the evidence. *Psychological Bulletin, 139*(1), 1-34.
- Lyon, T. (1999). The new wave in children's suggestibility research: A critique. *Cornell Law Review, 84*, 1004-1087.
- Montoya, J. (1995). Lessons from Akiki and Michaels on shielding child witnesses. *Psychology, Public Policy and Law, 78*(1) 340-351.
- Mydans, S. (1994, June 3). Prosecutors rebuked in molestation case. *The New York Times*. Retrieved from <http://www.nytimes.com/1994/06/03/us/prosecutorsrebuked-in-molestation-case.html>
- Nesbitt, M., & Markham, R. (1999). Improving young children's accuracy of recall for an eyewitness event. *Journal of Applied Developmental Psychology, 20*(3), 449-459.
- People of the State of California vs. Dale Akiki, No. CR122381 (S.D. Ca. May 31, 1991)
- People of the State of California vs. Dale Akiki, No. CR1293595 (S.D. Ca. February, 20 1992).
- Pilon, F.M. (2004). *Improving preschoolers' memories for the sources of events: A comparison of two source-monitoring training techniques* (Unpublished master's thesis). Wilfrid Laurier University, Ontario.
- Poole, D.A., & Lamb, M.E. (1998). *Investigative interviews of children: A guide for helping professionals*. Washington, DC: American Psychological Association.
- Powell, M.B. (2004). *Improving the reliability of child witness testimony in court: The importance of focusing on questioning techniques*. Paper presented at the AIJA Child Witness-Best Practices for courts' seminar, District Court of New South Wales.
- Reinhold, R. (1990, January 24). The longest trial- a post mortem; collapse of child-abuse case: so much agony for so little. *The New York Times*. Retrieved from <http://www.nytimes.com/1990/01/24/us/longest-trial-post-mortem-collapse-child-abuse-case-so-much-agony-for-so-little.html>
- Repacholi, B.M., & Gopnik, A. (1997). Early reasoning about desires: Evidence from 14- and 18-month-olds. *Developmental Psychology, 33*(1), 12-21.
- Schreiber, N., Bellah, L.D., Martinez, Y., McLaurin, K.A., Strok, R., Garven, S., & Wood, J.M. (2006). Suggestive interviewing in the McMMartin preschool and Kelly Michael's daycare abuse cases: A case study. *Social Influence, 1*(1), 16-47.

- Singer, D.G., & Singer, J.L. (1992). *The house of make believe: Children's play and the developing imagination*. Cambridge, MA: Harvard University Press.
- Templeton, L.M., & Wilcox, S.A. (2000). A tale of two representations: The misinformation effect and children's developing theory of mind. *Child Development, 71*(2), 402-416.
- Tenney, E.R., Small, J.E., Kondrad, R.L., Jaswal, V.K., & Spellman, B.A. (2011). Accuracy, confidence, and calibration: How young children and adults assess credibility. *Developmental Psychology, 47*(4), 1065-1077.
- Thierry, K.L., & Spence, M.J. (2002). Source-monitoring training facilitates preschoolers' eyewitness memory performance. *Developmental Psychology, 38*(3), 428-437.
- Wellman, H.M. & Liu, D. (2004). Scaling of theory-of-mind tasks. *Child Development, 75*(2), 523-541.

