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## When memory falls short: The effect of suggestibility and repeated questioning on 3- to 5-year-old children's recognition of event details

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## Abstract

The present study investigated children's event recognition as a function of feedback, suggestible question type, and repeated questioning. Forty-three 3- to 5-year-old children read a book and were asked twelve positive-leaning, negative-leaning, and additive-misinformation questions. After six and twelve questions, children were presented with positive or negative feedback and asked the same questions again. Feedback did not affect response accuracy; however, children's likelihood of changing their answer when questioned a second time varied as a function of question type. Children answered negative-leaning questions more accurately the second time, additive-misinformation questions less accurately the second time, and showed no change with positive-leaning questions. These findings extend prior knowledge of factors that influence children's recollection of an event.

*Keywords:* eyewitness testimony, suggestibility, event memory, feedback, preschoolers

When Memory Falls Short: The Effect of Suggestibility and Repeated Questioning on 3- to 5-year-old Children's Recognition of Event Details

In the court of law, a witness's ability to provide accurate, unbiased, and untainted accounts of key events is essential to the preservation of justice in our society. Most of the time, a case can be won or lost based on what is said by these key eyewitnesses (Hallisey, 1995) – but what happens when we are faced with an account that cannot be trusted or that is simply inaccurate? The legitimacy of an eyewitness's testimony may come into question particularly when an account is attributed to a child (Goodman, Golding, Helgeson, Haith, & Michelli, 1987). Accurate eyewitness accounts, of course, extends beyond the courtroom and into our daily society. With this in mind, new research to improve both the validity of the court system and questionings in our day-to-day lives will always be in high demand. Previous literature has highlighted several key factors that influence post-event response accuracy including suggestibility, question structure, and executive functioning. The present study aimed to extend this prior research by exploring the influences of feedback and repeated suggestible question types on young children.

To investigate the suggestibility of children, Cassel and Bjorklund (1995) used 'leaning' questions and measured the resulting effects on response accuracy. The authors looked at age differences by recruiting three age groups: 6-year-olds, 8-year-olds, and a group of college-aged adults. They also investigated the effect of time delay across immediate, one week, and one month intervals for accuracy in memory retention over time. The two types of suggestible questions were positive-leaning and negative-leaning questions. Positive-leaning questions were constructed to lead the responder towards the correct answer and negative-leaning questions were constructed to lead the responder towards the incorrect answer. One key finding from this

study indicated that memory and free-recall abilities improved as age increased. The results also showed that participants who were asked positive-leaning questions were correct more often than participants who were asked negative-leaning questions. Specifically, these results were most prominent in the 6-year-old group, indicating younger children are more influenced by suggestible questioning than older children and adults.

Whereas Cassel and Bjorklund (1995) looked across age groups and measured suggestibility by using different question types, Garven, Wood and Malpass (2000) conducted a study to investigate feedback during an interview setting. Feedback or reinforcement, is a questioning technique where interviewers use positive or negative comments to potentially influence responses. For positive feedback, an interviewer might say "Great, you're doing an excellent job", whereas for negative feedback an interviewer might say "Oh no, you aren't doing very well". After reading a story to 5- to 7-year-olds, Garven et al. (2000) treated one group with positive feedback and another group with negative feedback. The authors found that children in the negative feedback condition exhibited more incorrect responses than those in the positive feedback condition. Thus, feedback affected response accuracy in children, and specifically negative feedback contributed towards false testimony responses.

In addition to feedback and suggestive questioning, incorrect answers may also be induced by the way questions are worded. Huff and Umanath (2017) investigated this possibility by evaluating additive- and contradictory-misinformation question types in adults. Additive-misinformation questions are constructed around events or details that were never present in the events that took place, whereas contradictory-misinformation questions are constructed around relevant details and events, but in ways inconsistent with what actually happened. Huff and Umanath (2017) found that regardless of age, accuracy was lower for questions containing

additive misinformation than for questions containing contradictory misinformation. This finding further suggests that the way a question is constructed can contaminate event memories and induce incorrect responses in an interview setting.

The present study was designed to explore the effect of feedback (positive and negative) and question type (positive-leaning, negative-leaning, and additive-misinformation) on event-specific response accuracy in children 3- to 5-years-old. To our knowledge, this was the first study to investigate the combined influence of feedback and question type in this age group. The to-be-remembered event was a story presented in a book. Immediately after the story, children were asked positive-leaning questions, negative-leaning questions, and additive-misinformation questions about the events depicted in the book. Children were randomly assigned to either a positive or negative feedback condition. In the positive feedback condition, children answered six questions about the book's events before being presented with the positive feedback: "Wow, you're doing great!" In the negative feedback condition, children answered six questions about the book's events before being presented with the negative feedback: "Uh oh, you aren't doing so well!" The children were then asked the same six questions as an opportunity to either keep or change their original answers. After the twelfth question, children again received feedback and were asked the last six questions again. The procedure ensured that every child would be asked each question twice.

We predicted that children in the positive feedback condition would change fewer responses when asked repeated questions than children in the negative feedback condition. We also predicted that the different question types would induce different levels of response accuracy. Specifically, we predicted positive-leaning questions would result in the best response accuracy performance as these questions lean towards the correct response, negative-leaning

questions would result in decreased response accuracy as these questions lean towards the incorrect response, and that additive-misinformation questions would also result in poor response accuracy given the introduction of events that did not happen. In addition, when questioned a second time, we predicted that children would change their answers to the negative-leaning and additive-misinformation questions more so than to the positive-leaning questions.

## Method

### Participants

Forty-three 3- to 5-year-old children ( $M = 48.05$  months,  $SD = 7.78$ , 41.86% female) were tested. Children were recruited from early education programs in the Greater Waterville, Maine area. This area's inhabitants are predominantly Caucasian and represent lower and middle class socioeconomic status households.

### Materials

**Event.** The children's book *Franklin's Canoe Trip* by Jelena Sisic, Mark Koren, Sean Jeffrey, and Sharon Jennings was used for the event. This book follows a young turtle named Franklin who accompanies his friend Bear and their fathers on a canoe trip. The story begins with the group driving out into the wilderness with an excited Franklin eager to explore. However, Franklin soon learns that camping is harder than it sounds. After canoeing and portaging for miles, Franklin wishes they had chosen to use a motorboat. When they finally reach their destination, Franklin and Bear are tasked with finding the perfect campsite, and they do so successfully. By the end of the book, Franklin comes around to the joys of camping and has lots of fun exploring the wilderness.

**Feedback conditions.** Feedback was manipulated after the study conducted by Garven et al. (2000). In the positive feedback condition, experimenters used the phrase "Wow, you're

doing great!" In the negative feedback condition, experimenters used the phrase "Uh oh, you aren't doing so well!"

**Suggestibility question type.** Three different question types were used: positive-leaning questions, negative-leaning questions, and additive-misinformation questions. An example of a positive-leaning question was "Franklin is a turtle, right?" where the question is leaning towards the correct answer of "yes." An example of a negative-leaning question was "They went camping with their moms, right?" when in fact they went camping with their dads and the question leans towards a response of "yes" when the correct answer was "no." An example of an additive-misinformation question was "Did they catch a blue fish?" when in fact the group never went fishing. Correct answers for additive-misinformation questions were either "no, that never happened" or "I don't know." In all there were four positive-leaning, four negative-leaning, and four additive-misinformation questions.

### **Procedure**

Parents received a letter describing the study, and they returned signed consent forms if they allowed their child to participate. Children with parent permission were approached and asked whether they would like to read a book with the experimenter. After agreeing to participate, children sat with the experimenter, and the experimenter read through the story, making sure to spend time on each page to process both the written information as well as the details of the pictures. After completing the read-through, the experimenter asked the children if they were ready to answer some questions about the book. Upon an affirmative reply, children were asked questions 1 – 6 (randomly selected from the four positive-leaning, four negative-leaning, and four additive-misinformation questions). After the six questions were answered, children received either positive or negative feedback; feedback was randomly determined with

21 children receiving positive comments and 22 children receiving negative comments. After this feedback, the first six questions were asked again, allowing children to either keep or change their answers. This process was repeated once more using questions 7 – 12 (order of questions was randomly determined from the remaining questions). Children were asked the six questions, provided the same type of feedback, and were questioned again. After answering all 12 questions two times, children were informed that they did a good job and were thanked for participating.

### Results

We used the number of correct responses given by children during the post-reading questioning as our dependent variable (response accuracy) and as the primary measure for answering our research question. Table 1 shows the mean number of correct responses for each question type organized by feedback condition and questioning time. Preliminary analyses tested for differences between the male and female children and revealed no significant differences. As a result, subsequent analyses were collapsed across male and female children.

In the main analysis of the study, we conducted a 2 (feedback condition: positive, negative) x 3 (question type: positive-leaning, negative-leaning, additive-misinformation) x 2 (repeated questioning: time one, time two) ANOVA with feedback condition tested as a between subjects factor and both question type and repeated questioning as within subjects factors. Results showed a significant main effect for question type,  $F(2, 82) = 49.96, p < .001$ , partial  $\eta^2 = 0.55$ , as well as an interaction between question type and repeated questioning,  $F(2, 82) = 5.78, p = .004$ , partial  $\eta^2 = .12$ . The results showed no main effect for, or interactions with, feedback conditions, all  $F_s < .25, p_s > .62$ .



Post-hoc tests with Bonferroni correction indicated that the main effect for question type was due to significant differences among all three question types. Children answered positive-leaning questions ( $M = 3.62, SE = .09$ ) with greater accuracy than negative-leaning questions ( $M = 1.29, SE = .19$ ) and additive-information questions ( $M = 2.28, SE = .20$ ). In addition, additive-information questions were more accurately answered than negative-leaning questions.

To further explore the interaction between question type and repeated questioning (Figure 1), we conducted three paired samples t-tests for accuracy differences between time one and time two for each question type. For negative-leaning questions, children performed better when they were asked the same questions the second time compared to the first time,  $t(42) = 2.55, p = .015, d = .39$ . For additive-misinformation questions, children performed worse when they were asked the same questions a second time compared to the first time,  $t(42) = 2.38, p = .022, d = 1.00$ . For positive-leaning questions, children performed equally well when they were asked the same questions a second time compared to the first time,  $t(42) = 1.94, p = .060$ .

### Discussion

The purpose of this study was to investigate how feedback and repeated suggestible questioning affects event-specific response accuracy in children 3 to 5 years of age. After reading *Franklin's Canoe Trip*, children were asked the same questions twice to measure changes to their answers after receiving positive or negative feedback. Our findings revealed that the type of feedback (positive or negative) had no effect on response accuracy. Instead, our findings showed that children changed their answer from time one to time two based on question type. Specifically, when children were asked the same negative-leaning questions a second time, response accuracy improved. Conversely, when children were asked the same additive-

misinformation questions a second time, response accuracy deteriorated. For positive-leaning questions, however, response accuracy from time one to time two did not change.

We found that positive-leaning and negative-leaning questions influenced children's response accuracy. These findings are consistent with other research on children's eyewitness reliability. Specifically, we showed that children 3- to 5-years-old perform worse when asked negative-leaning questions than when asked positive-leaning questions, which has already been shown with 6-year-olds and 8-year-olds (Cassel and Bjorklund, 1995). However, Cassel and Bjorklund (1995) only used positive- and negative-leaning questions during the one week interview, so our study extends these findings to also be relevant immediately after the event. We have also extended these findings by repeating the positive- and negative-leaning questions. Children's performance improved from time one to time two when asked negative-leaning questions, with no change in performance from repeating positive-leaning questions.

Further, our findings suggest that response accuracy deteriorates when 3- to 5-year-olds are asked questions that introduce new information. These findings are consistent with other research concerning the usage of additive-misinformation questions. Whereas Huff and Umanath (2017) tested adults with additive-misinformation questions and found reduced response accuracy, our study extends this work to young children and the findings suggest that additive-misinformation questioning may also contaminate the memories of young children. Huff and Umanath (2017) also did not repeat the additive-misinformation questions in the same way as our study, opting to provide warnings for misleading questions during time two. Therefore, our study broke new ground by repeating additive-misinformation questions to children and finding that their response accuracy decreased when asked these questions for a second time.

Our key finding showed that, regardless of the type of feedback, response accuracy in children is affected by question type when questions are repeated. Specifically, children performed better when asked negative-leaning questions a second time, and performed worse when asked additive-misinformation questions a second time. Similarly, Poole and White (1993) found that 4-year-olds are more likely than adults to change their answers to the same questions as more time passes between the event and the questioning. We have further extended these findings to show that children's answers can be changed during immediate questioning by asking negative-leaning and additive-misinformation question types.

The lack of an effect of type of feedback in the present study is surprising in light of the fact that Garven et al. (2000) found that children in the positive feedback condition tended to change their answers less frequently than those in the negative feedback condition. One possible explanation likely stems from the difference in how we conveyed feedback. We used the same language as Garven et al. (2000) for the positive feedback condition ("Wow, you're doing great!"); however, we deviated from the language used in the negative feedback condition. Specifically, Garven et al. (2000) used phrases such as "Are you going to be stupid, or are you going to be smart and help us here?" as negative feedback, but we chose to use the phrase "Uh oh, you're not doing so well!" We chose to make this change because we viewed the language used by Garven et al. (2000) as inappropriate for use with the young children we tested. It is possible that because of the change in wording, children who were in our negative feedback condition did not feel as pressured to change their answers like the participants in Garven et al. (2000) did, and therefore feedback did not have an effect in our study.

In the present study, we asked children questions about the event immediately. Moreover, the questions were repeated by the same person. One direction for future research is

to provide a more realistic parallel to the context of eyewitness testimony. In naturalistic contexts, children are often repeatedly questioned but not always immediately after an event or immediately after initially questioned. Moreover, children are often questioned repeatedly by different people.

In conclusion, our findings suggest that response accuracy in young children can be influenced by suggestible question types and repeated questioning. Specifically, 3- to 5-year-olds perform best when faced with positive-leaning questions and struggle most when faced with negative-leaning questions. Additive-misinformation questions also diminished response accuracy, although not to the extent of negative-leaning questions. When these questions are repeated, response accuracy in children is influenced in several ways. When asked repeated negative-leaning questions, children's response accuracy *improves*, such that they are more likely to not agree to a negative leaning question the second time it is asked. At the same time, we found that repeating additive-misinformation questions causes children's response accuracy to *diminish*, such that children are more likely to make errors the second time an additive-misinformation question is asked. These findings extend our knowledge that suggestibility can affect children's recollection of an event, raising concerns for their reliability as eyewitnesses in a court of law. Further, this study highlights that when asking a child about an event, the structure of every question should be considered and scrutinized to avoid influencing their responses.

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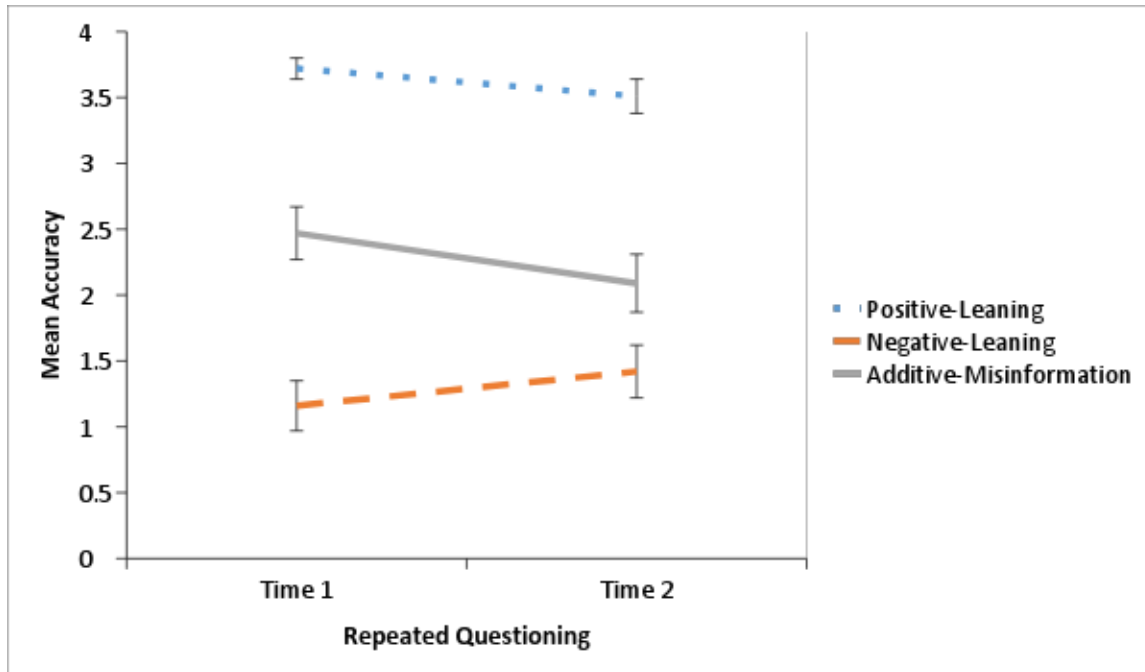
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Table 1

*Mean Response Accuracy (Standard Deviation) as a Function of Feedback and Question Type*

*(Max = 4 for each question type)*

Question Type	Repeated Questioning					
	Time One			Time Two		
	Negative- Leaning	Positive- Leaning	Additive- Misinformation	Negative- Leaning	Positive- Leaning	Additive- Misinformation
Negative Feedback	1.14 (1.28)	3.72 (0.55)	2.55 (1.33)	1.55 (1.41)	3.41 (0.91)	2.05 (1.56)
Positive Feedback	1.19 (1.25)	3.71 (0.56)	2.38 (1.36)	1.29 (1.19)	3.61 (0.74)	2.14 (1.39)



*Figure 1.* Mean response accuracy as a function of question type across repeated questioning periods. Error bars reflect the standard error of the mean.