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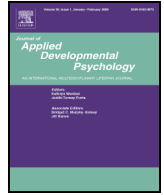
48. Valence, implicated actor, and children's acquiescence to false suggestions

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Valence, implicated actor, and children's acquiescence to false suggestions



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ABSTRACT

Although adverse effects of suggestive interviewing on children's accuracy are well documented, it remains unclear as to whether these effects vary depending on the valence of and the actor implicated in suggestions. In this study, 124 3–8-year-olds participated in a classroom activity and were later questioned about positive and negative false details. The interviewer provided positive reinforcement when children acquiesced to suggestions and negative feedback when they did not. Following reinforcement or feedback, young children were comparably suggestible for positive and negative details. With age, resistance to suggestions about negative details emerged first, followed by resistance to suggestions about positive details. Across age, more negative feedback was required to induce acquiescence to negative than positive false details. Finally, children were less willing to acquiesce when they (versus the confederate) were implicated. Findings highlight the interactive effects of valence and children's age on their eyewitness performance in suggestive contexts.

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During the past several decades, an impressive body of research has emerged concerning children's memory, suggestibility, and propensity toward false reports. Among the most consistent findings, in addition to age-related improvements in accuracy, is the powerful effect of interviewers' suggestions on children's performance (Bruck & Ceci, 1999; Cassel, Roebbers, & Bjorklund, 1996; Lamb, La Rooy, Malloy, & Katz, 2011; Poole & Lindsay, 1995). What remains less well documented, however, is how the content of those suggestions influences children's errors.

We contend that both the valence of a falsely suggested act (i.e., whether the act could be construed as positive or negative) and whether the child or someone else is implicated in the act influence the likelihood of children's acquiescence. Abuse experiences – or portions thereof – often involve negative acts most often perceived of as undesirable. Children, especially those who are young and who lack complex understanding of the dynamics of the abuse, may feel complicit in those acts (Anderson, Martin, Mullen, Romans, & Herbison, 1993; Hazzard, Celano, Gould, Lawry, & Webb, 1995; Quas, Goodman, & Jones, 2003). Scientific research, however, has often focused on how interviewer's suggestions about positive, desirable acts affect children's

acquiescence. As we describe here, there are both theoretical and empirical reasons to suspect that the valence of falsely suggested acts, as well as who is allegedly complicit in those acts, will directly influence how easily children of different ages can be led to acquiescence. We tested these possibilities in the present research. Before describing our study, we review relevant theory and research concerning interviewer suggestion, event valence, implicated actor, and children's developmental level.

Interviewer suggestion

A contemporary development in the field of children's eyewitness abilities involves the distinction between suggestive questions and suggestive context (e.g., Bruck & Ceci, 2004; Goodman & Quas, 2008). Suggestive questions can be detrimental because they often imply in their phrasing that events or portions thereof occurred when in fact they did not. Whereas at times even older children are susceptible to err in response to suggestive questions, younger children are more susceptible, especially in response to tag and presumptive questions (e.g., "You came in at night, didn't you?" and "When he came in your room, was he mad?"; Cassel et al., 1996; Lamb & Fauchier, 2001; Lyon, Malloy, Quas, & Talwar, 2008). In addition to the suggestiveness of questions, the context surrounding the interview itself can be quite influential in affecting children's suggestibility. This context may include pre-interview statements made by the interviewer as well as his or her behaviors during the interview that convey what the interviewer

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wants to hear (Leichtman & Ceci, 1995; see also Goodman & Quas, 2008). This type of suggestive context can be heuristically labeled as interviewer bias.

Theoretically, the powerful effect of interviewer bias makes logical sense. Even young children understand basic conversational pragmatics. They understand that adults are sources of information and children should listen and learn from adults (Bjorklund et al., 2000; Clément, Koenig, & Harris, 2004; see also Ceci & Bruck, 1993). Through verbal reinforcement, they can quickly adapt their responses (Salzinger, 1959). Finally, children recognize adults' status as knowledgeable authority figures (Taylor, Cartwright, & Bowden, 1991) and, without explicit instructions or guidance, may not question the accuracy of what adults say (Koenig & Harris, 2005), leading to children's common willingness to agree with information provided by adults, including their suggestions (Ceci, Ross, & Toglia, 1987).

In a series of studies, children's propensity to err after being subjected to highly biased interviewers was demonstrated by Garven and colleagues (Billings et al., 2007; Garven, Wood, & Malpass, 2000; Garven, Wood, Malpass, & Shaw, 1998). In an initial investigation, the researchers reviewed transcripts from the highly publicized, controversial "McMartin preschool" sexual abuse case from the 1980s and identified interviewer behaviors that appeared to be most influential in creating a suggestive, biased context (Garven et al., 1998). These included telling children that their peers already disclosed, giving children praise/reinforcement for assenting to interviewer suggestions and negative feedback for disagreeing ("positive and negative consequences"), repeating questions children had already answered, and asking children to imagine or pretend that details occurred and then asking children to describe those details. The researchers then experimentally manipulated the use of these interviewer strategies in mock forensic interviews with children about a prior interaction with an adult and found adverse effects on children's accuracy (Billings et al., 2007; Garven et al., 1998).

The most influential of the interviewer techniques appeared to be positive and negative consequences. Such is not surprising given the reinforcement and punishment properties of this strategy. The praise children received reinforced acquiescing, whereas the negative feedback children received served as punishment for not acquiescing. Both reinforcement and punishment are classic forms of operant conditioning well known for their effects on a wide range of behaviors across the lifespan (Tharp & Wetzel, 1969). Selective reinforcement may play a crucial role in creating a biased context because of its direct effect on children's efforts to comply with and please adult conversational partners (Lamb & Brown, 2006; see also Ceci & Bruck, 1993). Such would suggest, as many have argued, that children's errors often are a result not of alterations in memory per se, but instead, a result of social acquiescence to the biased interviewer (Bjorklund et al., 2000; Cassel et al., 1996).

Valence

Despite the significance of Garven and colleagues' work in highlighting the effects of selective reinforcement and biased interviewers on children's suggestibility, the work does not provide insight into potentially important nuances in the effects, nuances that may directly influence conclusions that have been drawn about children's eyewitness accuracy and acquiescence tendencies. One such condition concerns the valence of the alleged acts, that is, whether the acts could be considered positive or negative. In one of Garven et al.'s (2000) studies, for example, children acquiesced nearly twice as often to fantastic than mundane details following exposure to the positive and negative consequence strategy, a pattern that has led to speculation that the use of selective reinforcement may actually induce children to acquiesce at higher rates for fantastic than mundane details. However, the fantastic details were primarily positive (e.g., visitor taking children on a helicopter) and hence may have been desirable to children,

whereas the mundane details were largely negative (e.g., touching, throwing, stealing) and hence may have led to avoidance on the part of children. The differences in valence could also have accounted for the pattern of results obtained, an interpretation consistent with other lines of work.

Studies of children's beliefs about the plausibility of fantastic and real events, for instance, have revealed the existence of a positivity bias. Children tend to report that positive fantastic and real events can occur but negative fantastic and real events cannot (Carrick & Quas, 2006; Samuels & Taylor, 1994). Likewise, in a classic false memory study conducted by Ceci, Loftus, Leichtman, and Bruck (1994) that employed highly biased interview techniques (e.g., repeatedly interviewing children and asking children to visualize events), children were significantly more likely to assent to suggested positive than negative events. The precise effect of valence, however, was not entirely clear because the suggested, false events varied not only in valence but also in level of child participation and event type. For instance, some false events implied children's direct and active involvement, (e.g., falling off a tricycle and getting stitches), whereas others implied minimal involvement (e.g., waiting for a bus). Direct participation can affect children's suggestibility, regardless of the valence of the events (Tobey & Goodman, 1992). In order to assess the importance of valence, it is necessary to vary directly and in a comparable manner the valence of suggested events provided by a biased interviewer.

Actor implicated

Another important consideration when evaluating children's suggestibility, especially in relation to a negative act, is the actor allegedly involved. Billings et al. (2007) exposed children to an interaction with a toy that later went missing. Children were then questioned suggestively about the missing toy. During the interview, a subset of the children was reinforced for acquiescing to questions implying that the toy was taken, possibly by them or by other children. Children were more likely to report that other children had taken the toy than to admit their own involvement, leading the authors to conclude that "[t]o the degree that children understood the possible negative implications for themselves, they became less willing to make false statements" (p. 134). Although such an interpretation is plausible, the interviewer implied that the other children who took the toy probably just wanted to play with it and would be returning it later, making it unclear whether children understood that they might be acquiescing to other children stealing.

Other research more clearly supports the proposition that children's acquiescence for negative events is affected by the alleged actors involved. For instance, children are more willing to disclose minor transgressions when someone else rather than they committed the transgression (Lyon & Dorado, 2008; Lyon et al., 2008), and when a stranger rather than a trusted adult committed the transgression (Lewis, Stanger, & Sullivan, 1989; Polak & Harris, 1999; Tye, Amato, Honts, Devitt, & Peters, 1999; Wilson, Smith, & Ross, 2003). Given that prior studies indicate that children are less willing to implicate themselves than someone else as having been involved in a negative event that actually occurred, (Lyon & Dorado, 2008; Lyon et al., 2008), children may similarly avoid implicating themselves more than someone else in a suggested negative act. Whether this tendency to acquiesce to false events that implicate others more than the self varies depending on whether the alleged act is negative or positive, though, needs to be tested directly.

Developmental level

Of course, any evaluation of children's suggestibility needs to consider their age or developmental level. In prior interviewer bias studies, particularly those that included interviewers' use of selective

reinforcement of children's responses, marginal to robust age differences emerged across children three to nine years of age (Billings et al., 2007; Garven et al., 1998; Quas et al., 2007). For example, Ceci et al. (1994) found that younger preschoolers were especially likely to assent to a false, suggested positive event, a tendency that could reflect desirability for the event more than an actual false belief that the event occurred (Woolley, 1997). Such a tendency could lead to particularly high rates of errors for positive details in young children, with a marked decline with age as children become better able to distinguish their desires from that which is real and hence more likely to respond in a manner that reflects reality.

At the same time, with age, children become more aware of the consequences associated with negative events, especially transgressions (Bottoms, Goodman, Schwartz-Kenney, & Thomas, 2002; Polak & Harris, 1999; Talwar & Lee, 2002). Several studies have revealed that children are less likely to disclose transgressions implicating themselves or someone close to them as they become older (Bottoms et al., 2002; Lyon et al., 2014; Talwar & Lee, 2002), a trend likely driven both by their desire to avoid punishment (Last & Aharoni-Etzioni, 1995) and by their emerging understanding of false beliefs which allows them to more skillfully conceal a transgression (Talwar, Gordon, & Lee, 2007). Of course, in these studies, the transgression actually occurred. Age related increases in children's ability to resist suggestions that negative events occurred may be even more robust, given older children's greater awareness of the consequences of assenting to negative acts and their ability to resist interviewer bias.

As a final note, although speculative, age may also relate to children's tendency to distinguish between suggestions concerning acts that they committed versus those committed by someone else. As mentioned, children tend to be less forthcoming about negative acts that they have committed. For example, when discussing conflicts with siblings, children tend to minimize their own transgressions compared to those of their siblings (Ross, Smith, Spielmacher, & Recchia, 2004; Wilson, Smith, Ross, & Ross, 2004). However, with age, children gain a greater understanding of intentionality and cause–effect relationships (Gardiner, Greif, & Bjorklund, 2011; Ohbuchi & Sato, 1994; Perner, 1988), and thus, likely better understand the consequences associated with actions, not just for themselves, but for others as well. As a result, older children may be less willing to agree to negative acts that someone else has committed, in addition, of course, to avoiding suggestions of negative acts that they purportedly committed.

Study overview

In the current study, we systematically investigated how valence (positive vs. negative) and actor (child vs. confederate) affected children's acquiescence to false suggestions. We exposed children to a classroom activity, led by a confederate, that included positive and negative components. Later, we interviewed the children about what happened, selectively reinforcing certain answers via the “positive and negative consequences” technique (Garven et al., 2000). Questions were asked about true acts and false, positive and negative acts, the latter of which had been committed by the child or the confederate.

We expected children to be more accurate (less suggestible) for negative compared with positive acts and that a greater amount of negative feedback would be necessary to induce acquiescence to negative acts. We likewise expected children to be more accurate when they were rather than the confederate was implicated as the protagonist who committed the false act, especially when that act was negative. Finally, with age, accuracy was expected to increase, particularly when negative acts were suggested. Also, accuracy in younger children was expected to be highest when they were implicated in a negative act, whereas for older children, accuracy was expected to be comparably high regardless of who was implicated.

Method

Participants

One hundred and twenty-four 3–8-year-old children ($M_{\text{age}} = 5.15$ years, 70 males) served as participants. This number included twenty-one 3-year-olds (14 male); thirty-two 4-year-olds (14 male); twenty-six 5-year-olds (14 male); fourteen 6-year-olds (9 male); fifteen 7-year-olds (8 male); and sixteen 8-year-olds (11 male). The sample was ethnically diverse: 38.5% Asian American; 33.3% Caucasian, non-Hispanic/Latino; 11.1% Hispanic/Latino; 14.5% multi-racial; 2.6% other. Prior to children's participation, parents provided written consent and children provided verbal assent.

Procedure

Session 1: Baker event

Children observed a 15-minute classroom demonstration in small groups ($M = 18$). A male or female confederate (hence referred to as male) visited the class, stood in front of the room, and led the demonstration, which involved showing the children, who were seated facing him, how to make cookies (Kulkofsky & Klemfuss, 2008). While completing the set of actions to make the cookies, he described each action and listed it on a large recipe board. To increase children's engagement, he asked scripted questions throughout and had children line up to add chocolate chips to the cookie batter. When he added the last ingredient (salt), an unexpected negative event occurred. Specifically, the lid fell off the salt shaker, causing all of the salt to spill in and ruin the batter. The confederate appeared sad, explained that the cookies were ruined, and threw the batter into a nearby trashcan.

Session 2: Suggestive interview

After a one-week delay ($M = 7.75$ days, $SD = .87$, range = 6–9), children were individually interviewed in a quiet location at their school by one of four unfamiliar female researchers who had not been present at the baker event. The interview contained fourteen closed-ended questions, the order of which randomly varied across children within each age group. Two of these were neutral, included to orient children to the event. Four of the questions were about the true details. These served as a baseline measure of children's event memory. Of primary interest were the remaining eight questions, all of which concerned false details. The content of these questions was counterbalanced such that all children were asked about the same detail or object, but the action committed concerning that detail varied in whether it was positive or negative. Most of the acts were selected based on those included in prior research (Garven et al., 2000; Leichtman & Ceci, 1995). Positive acts could be considered positive or playful, whereas negative acts involved undesirable or prohibited actions. The suggestions also varied within each valence such that the child allegedly committed half of the acts and the confederate committed the other half, with all questions phrased so that the actor came first in the sentence, followed directly by the alleged act committed. For example, some children were asked whether they *gave* a tool to the confederate to use during the event (positive, giving), whereas others were asked whether they *stole* a tool (negative, stealing). In another example, children were asked whether they *cheered* during the event, and others were asked whether they *screamed* during the event. An example of a suggested act in which the confederate was implicated is whether the confederate *tapped* the children with a spatula (positive or playful, tapping), or *hit* the children with a spatula (negative, hitting).

Interviewer bias was systematically induced during the interview through the use of selective reinforcement, the strategy described by Garven et al. (2000) as the most effective method of inducing errors. We initially simply provided children with positive or negative feedback depending on whether their answers were consistent or not with the false details. However, pilot testing revealed that children were, for

the most part, unwilling to comply with suggestions using only this feedback. Thus, we framed the interview as a “game” at the outset, with the interviewer explaining that she and the child were going to tell a story about the baker visit that had taken place a week prior. This type of framing is consistent with Ceci et al. (1994), who found high rates of acquiescence after children were instructed to play a game during the interviews.

For false questions, when children acquiesced, they received positive reinforcement (e.g., “That’s right! You’re doing great!”). When children did not agree or said “I don’t know,” they received negative feedback (e.g., “Come on, that’s not right. Listen again and tell me”) up to two times after the initial question was asked. For true questions, children received reinforcement simply for answering, and negative feedback up to two times following the initial question for not answering or saying “I don’t know.” Stated another way, for both true- and false-detail questions, if children did not provide the desired response when first asked, the question was immediately re-asked a second and third time, each followed with similar selective reinforcement feedback behaviors. As such, all children were asked questions at least once, with some children being asked questions up to three times.

The interview was followed by tasks unrelated to the current study. These are not considered further. At the end of the session, children were fully debriefed and returned to their classrooms.

Coding

Three trained research assistants, blind to study hypotheses, coded the suggestive interviews for two sets of information: (1) children’s responses to questions; and (2) the number of negative suggestive feedback prompts given per question. Kappas, calculated across measures and pairs of research assistants on 26% of the sample that included children across age, ranged from .86 to .91. Discrepancies were discussed and the assistants evenly divided the remainder of the interviews to code.

Children’s responses to the true and false-detail questions were coded as *correct*, *incorrect*, *don’t know*, or *non-definitive* (e.g., *repetition request*, *no answer*, *unscorable*). Don’t know responses constituted 8.3% of children’s initial and 4.1% of their final responses, and non-definitive responses constituted 16.5% of children’s initial and 6.9% of their final responses. Neither is considered further. Children’s correct and incorrect responses were strongly negatively correlated $r_s(124) \geq -.55$, $ps < .001$. Only correct responses are discussed.

Proportion scores were created for both the true- and false-detail questions. These were first calculated for children’s initial answers. Scores for true questions were created by averaging children’s correct initial responses across the four true questions. A similar procedure was conducted to create the false-detail question proportions, except that children’s correct initial responses were averaged across the eight false questions.

Second, proportion scores were created for children’s final answers (i.e., responses after the interviewer provided feedback) in a similar fashion. For some children, though, the final response was the first response because they conformed to the suggestion the first time the question was asked (it was not necessary to provide negative feedback and repeat a question once children acquiesced). For others, though, their final response was their second or third response, depending on the amount of feedback necessary to induce children to respond or acquiesce. Thus, while we calculated a final response proportion score for all children, the responses included in the calculation differed across children because the number of negative feedback prompts varied. For example, a child who immediately acquiesced had an identical initial and final answer. Conversely, a child who did not immediately acquiesce and received negative feedback had different initial and final answers in most cases.

To capture directly, therefore, the amount of pressure needed to induce acquiescence, we counted the number of negative feedback prompts for each of the false-detail questions and divided by the

number of false questions asked. Feedback prompts were defined as the initial question plus the number of times the interviewer provided negative feedback to elicit a desired response. The interviewers were instructed to ask questions up to three times (i.e., initial question plus two prompts). Children’s scores thus reflected the number of prompts asked either until the children acquiesced or until the maximum number of prompts was reached. In a few instances, however, the interviewers asked more due to child distraction, child request, or error (range = 1–4, $M = 1.69$, $SD = .51$).

Results

Preliminary analyses indicated that child and confederate gender was evenly distributed across child age and was unrelated to children’s response accuracy. A one-way age (3–8 years) analysis of variance (ANOVA) revealed no age differences in delay between sessions. Further, correlational analyses revealed that the delay was unrelated to children’s response accuracy. Finally, we examined children’s responses to the four questions about true event details, which indexed their general memory for the classroom event. The children’s mean response accuracy was 76% the first time the questions were asked, and 82% following feedback. The children’s accuracy for the true questions also increased with age, for both initial and final responses, $r_s(124) \geq .25$, $ps \leq .006$, as would be expected.

Children’s responses to false-detail questions

To test our hypotheses, we conducted a series of 6 (age) \times 2 (valence: positive vs. negative) \times 2 (actor: child vs. confederate) ANOVAs predicting children’s accuracy and feedback prompt proportion scores. Age varied between subjects, and valence and implicated actor varied within subjects. Across models, all main effects and interactions were examined, with follow-up simple effect analyses and planned comparisons conducted on significant effects. Because our sample sizes were unequal across age, effects involving age were confirmed via Brown–Forsythe tests for unequal variances (Brown & Forsythe, 1974; Wilcox, 1987). Only those that were significant are reported here. Finally, because responses included in children’s initial and final answer proportion scores were, for some children, identical, initial and final answer proportions could not be included as a within-subject factor in our models, and we analyzed children’s initial and final proportion scores separately.

Valence, actor, and age

Children had considerable difficulty, overall, accurately answering the false-detail questions. The first time the questions were asked, accuracy was 27%, and after the prompts, accuracy was a mere 10%. Children’s performance, across age and event valence, is presented in Fig. 1 (initial responses) and 2 (final responses).

When we entered children’s initial answer proportion scores into a 6 (age) \times 2 (valence) \times 2 (actor) ANOVA, significant effects of age and actor emerged, $F_s(5, 118) \geq 5.96$, $ps \leq .016$, $\eta^2_s = .27$ and $.05$, respectively. Planned pairwise comparisons revealed that 3-year-olds ($M = .13$, $SD = .22$) provided fewer correct responses than all other age groups $t_s(118) \geq 2.39$, $ps \leq .018$. Also, 4- ($M = .23$, $SD = .30$), 5- ($M = .24$, $SD = .28$), and 6- ($M = .28$, $SD = .30$) year-olds provided fewer correct responses than 7- ($M = .40$, $SD = .28$) and 8- ($M = .42$, $SD = .36$) year-olds, $t_s(118) \geq 2.04$, $ps \leq .044$. Finally, as expected, children were significantly more accurate when they were implicated ($M = .31$, $SD = .30$) than when the confederate was implicated ($M = .25$, $SD = .26$) in the false act.

Next, we considered children’s final answer proportion scores. The effects of age and actor were again significant, $F_s(5, 118) \geq 3.68$, $ps \leq .004$, $\eta^2_s = .14$ and $.10$, and in the same direction (proportion correct for the self versus the confederate was $M = .15$, $SD = .25$ and $M = .08$, $SD = .18$, respectively). The age effect, however, was

Children's Initial Responses to False-Detail Questions

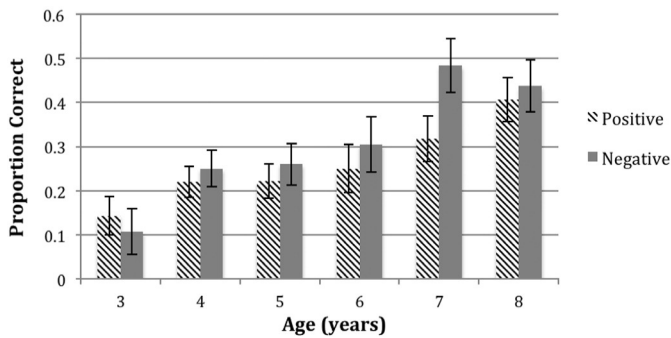


Fig. 1. Mean proportion correct responses to false-detail questions initially. Means by age do not equal to 1 because *incorrect*, *don't know*, and *non-definitive* responses are not included.

qualified by a significant Age \times Valence interaction, meaning that, at different ages within our sample, children's willingness to acquiesce differed for the positive and negative suggestions, $F(5, 118) = 2.61$, $p = .028$, $\eta^2 = .10$ (Fig. 2). Simple effect analyses examining each age category separately, revealed that 8-year-olds provided a greater number of correct responses than all other ages, $t_s(118) \geq 2.54$, $p_s \leq .02$, when asked about suggested *positive* acts. That is, the oldest children were the least suggestible across all of the age groups in response to the positive suggestive questions. Additionally, both 7- and 8-year-olds provided a greater number of correct responses than all other age groups, $t_s \geq 2.38$, $p_s \leq .02$ when asked about suggested *negative* acts, meaning that the two oldest age groups were significantly less willing to agree with the negative suggestive questions than the younger age groups (Fig. 2).

Interviewer reinforcement

We anticipated that more feedback would be necessary to induce children to acquiesce to suggested negative than positive acts, and acts implicating themselves than the confederate. As a reminder, feedback could range from one to three prompts (including the initial question). When the feedback prompts for false-detail questions were entered into the 6 (age) \times 2 (valence) \times 2 (actor) ANOVA, the effect of valence was significant, $F(1, 118) = 14.58$, $p < .001$, $\eta^2 = .11$. As hypothesized, interviewers provided a greater number of prompts

Children's Final Responses to False-Detail Questions

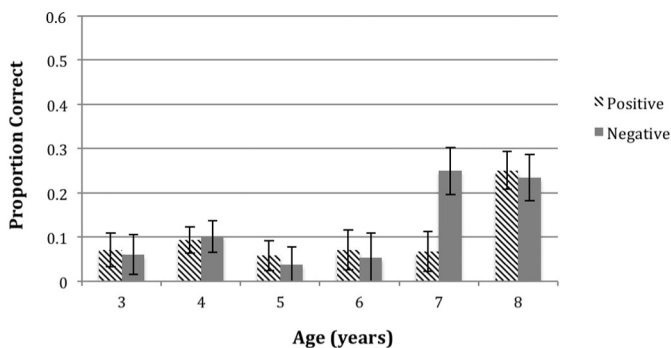


Fig. 2. Mean proportion correct responses to false-detail questions following feedback. For the significant interaction, 7- and 8-year-olds had a higher proportion correct for negative questions than all other age groups; 8-year-olds had a higher proportion correct for positive questions than all other age groups. Means by age do not equal to 1 because *incorrect*, *don't know*, and *non-definitive* responses are not included.

when attempting to induce acquiescence for negative ($M = 2.30$, $SD = .92$) than positive ($M = 2.05$, $SD = .93$) false details. Unexpectedly, interviewer prompt use did not differ when questions implicated the children versus the confederate in the act, $F(1, 118) = 1.97$, $p = .163$.

Discussion

The overarching goal of the current research was to examine, in a systematic and controlled manner, how the valence of false acts and the implicated actor involved in those acts, in conjunction with age, affected children's suggestibility. In some ways, our findings are consistent with prior work, revealing age-related improvements in accuracy and particularly poor performance when interviewers provide repeated selective reinforcement and negative feedback (Bruck, Ceci, & Hembrooke, 2002; Ceci et al., 1994). In other ways, though, our findings are unique and reveal both important developmental changes in the effects of valence on suggestibility, but also developmental invariance in children's tendency to acquiesce when they themselves are the implicated actor.

First, children's willingness to agree with positive versus negative acts varied with age, as we had predicted, but only after children received reinforcement and negative feedback. Younger children readily agreed to both positive and negative false details when induced to do so via selective reinforcement and negative feedback. With age, children's willingness to acquiesce decreased. This resistance to suggestion was evident at age 7 for negative details and at age 8 for both negative and positive details. Thus, it appears that children begin to show a more complex understanding of the consequences of negative events in the early school-age years (Stein & Levine, 1999; Talwar & Lee, 2002), which may have contributed to their greater accuracy, despite receiving strong social pressure from an interviewer. Moreover, by age 8, children seem to be aware not only of the consequences of assenting to negative details but to false details generally, leading to comparable accuracy irrespective of valence. Around this age, improvements in both cognitive and socio-emotional skills (e.g., source-monitoring, theory-of-mind; Flavell, 2004; Lindsay, Johnson, & Kwon, 1991; Roberts & Blades, 2000; Roberts & Powell, 2001) likely contributed to children's increased willingness to disagree with an interviewer's negative feedback, leading to improvements in accuracy.

Another novel finding concerns the differential effects of selective reinforcement feedback on children's acquiescence to questions about positive versus negative acts. We expected that more feedback would be required to induce acquiescence to negative than positive acts, an expectation confirmed by our data. Across age, all children required more pressure – in the form of negative feedback – to agree with the negative false details. Children's positivity biases (Carrick & Quas, 2006; Samuels & Taylor, 1994) and reluctance to discuss wrongdoing (Lyon et al., 2014; Talwar & Lee, 2002) may underlie this trend. Of interest, valence did not further interact with whether the child or confederate was implicated to affect children's accuracy. Had children's performance varied more, or rather, had more children not performed so poorly, perhaps the valence by actor interaction would have been significant. Variability may also have been influenced by the limited number of questions included in each condition (i.e., for the within subject analyses including both valence and actor, there were two questions per condition). Had we suggested a greater number of positive and negative acts engaged in by both the child and confederate, or had we suggested more striking and salient negative versus positive acts, we may have found greater differences between actors and valence.

Although valence did not interact with who was implicated to influence children's performance, who was implicated was directly related to children's correct responses, initially and following the feedback. Indeed, as predicted, children were less willing to agree to acts involving themselves than those involving the confederate. Because children had only met the confederate at the classroom event, and he was otherwise

a stranger, they were perhaps more concerned about the potential consequences associated with the negative acts for themselves than for the confederate. In future research, it may be of interest to test whether differences in children's suggestibility between the self versus someone else as the actor persist when the other actor is quite familiar to children, such as a friend, teacher, or even parent.

We had expected that valence, actor, and age would interact. With age, children gradually become more aware of others' perspectives and the consequences of their actions for others (Decety & Sommerville, 2003; Perner & Lang, 1999), which could decrease their willingness to agree with false suggestions about someone else, especially when the individual allegedly engaged in a negative act. In addition, children's self-control increases markedly with development (Perner & Lang, 1999), which may allow them to deny the immediate gratification of positive interviewer feedback in order to avoid negative consequences for someone else that may arise later as a result of agreeing to false suggested acts.

Although this expectation was not supported, some hints that such an understanding may have been emerging could be seen upon closer examination of the data. In particular, the 8-year-olds' final response accuracy to questions about the confederate ($M = .20$) was quite a bit higher than the other age groups' accuracy about the confederate ($M_s = .02-.12$), suggesting that, perhaps starting around age 8, children begin to recognize the consequences of false reports for others and are less willing to agree that someone else engaged in a suggested act. Had we had a larger sample, included slightly older ages, or employed additional forms of reinforcement that led to greater variability in responses, higher-order interactions may have emerged, a possibility that needs to be tested with a large range of positive and negatively valenced questions given that the three way interaction we tested was non-significant.

Three other points about the study are important to consider. For one, we suspect that the poor performance of children in our study reflected acquiescence resulting from selective reinforcement and a suggestive interview context rather than robust changes in memory (Zaragoza & Lane, 1994). We employed a delay of approximately one week between the to-be-remembered event and the memory interview. This delay is common to that in prior studies that have examined highly suggestive reinforcement tactics on children's suggestibility and found robust effects (Garven et al., 1998, 2000; Kulkofsky & Klemfuss, 2008; Scullin & Ceci, 2001). We also analyzed children's responses to questions about true details and found a fairly high level of response accuracy (76%–82%). Thus, while forgetting does increase errors and may have contributed some to children's suggestibility, it is unlikely that lack of memory trace accounted for a majority of children's acquiescence. Nonetheless, it will be interesting, in future research, to investigate whether some suggested acts are more easily overwritten than others and if so, the reasons why. Future work should also evaluate whether children continue to provide suggested information in subsequent interviews, particularly those that are conducted in a scientifically supported manner, which include a free-recall component followed by recognition questions and do not include suggestive reinforcement.

Second, for ethical and practical reasons (i.e., we did not want to induce children to commit true negative events such as tearing, stealing, or screaming), we did not experimentally manipulate the true details. Thus, we could not evaluate whether interviewer feedback differentially affected children's responses to questions about true positive versus negative details. How children's reticence to talk about true experiences is affected by the valence of the experience in the face of interviewer pressure is important to consider in future research (see Lyon & Dorado, 2008, and Lyon et al., 2008, for related findings).

Third, it is important to keep in mind the playful context that we found necessary in order to successfully induce high rates of acquiescence and to sensitively test for valence and actor differences. Children were told that they and the interviewer were going to tell a story about the baking event; instructions similar to those employed in prior studies

that also involved telling children to imagine events happening, or to guess, pretend, or play a game concerning their experiences (Bruck, Ceci, & Hembrooke, 1997; Ceci et al., 1994; see also Bruck & Ceci, 1999). These studies have been widely cited and have had a significant impact in scientific, policy, and even legal arenas. If interviewers adopt this approach in actual interviews, our results suggest that children's accuracy will be severely compromised, even when children are asked about negative events and about their own actions. On the other hand, to the extent that real-world interviewers approach interviews in a more serious manner, findings from research such as ours, as well as other studies that have induced playful interview contexts, are not as relevant. Instead, other factors, such as the types of questions asked, sources of potential influence (e.g., family pressure to disclose or maintain a particular response), and children's motivations and perceptions, need to be evaluated in relation to children's reporting and acquiescence.

In closing, the current investigation has several important theoretical implications regarding the role of socio-emotional influences on children's reporting of their experiences. The powerful effects of selective reinforcement on children's reports were confirmed in our study, which demonstrated how difficult it is for children to maintain accuracy when they receive social pressure to acquiesce from someone in authority. Importantly, our results also showed differences in how the content of suggestions influences children's willingness to acquiesce. Children were significantly more likely to agree with positive, playful, or fun suggestions than negative suggestions, that is, children showed an affinity toward agreeing with or discussing positive actions. However, although children of all ages demonstrated this affinity, with development, children were less willing to agree with suggestions overall, including those that involved positive actions. Children's greater self-control, understanding of the consequences of their actions, and greater realization that their perspectives of the event may differ from the interviewer's perspective (Decety & Sommerville, 2003; Perner & Lang, 1999; see also Flavell, 1999), may have all contributed to the older children's decreased suggestibility for both positive and negative acts. Practically speaking, a clear understanding of study procedures is needed to ascertain when children are and are not likely to acquiesce when selectively reinforced and hence when research is applicable to policy and legal arenas. Both field and experimental studies are needed in future research so that our understanding of the circumstances that surround children's acquiescence can continue to be illuminated.

References

- Anderson, J., Martin, J., Mullen, P., Romans, S., & Herbison, P. (1993). Prevalence of childhood sexual abuse experiences in a community sample of women. *Journal of the American Academy of Child and Adolescent Psychiatry*, 32, 911–919. <http://dx.doi.org/10.1097/00004583-199309000-00004>.
- Billings, F. J., Taylor, T., Burns, J., Corey, D. L., Garven, S., & Wood, J. M. (2007). Can reinforcement induce children to falsely incriminate themselves? *Law and Human Behavior*, 31, 125–139. <http://dx.doi.org/10.1007/s10979-006-9049-5>.
- Bjorklund, D. F., Cassel, W. S., Bjorklund, B. R., Brown, R. D., Park, C. L., Ernst, K., & Owen, F. A. (2000). Social demand characteristics in children's and adults' eyewitness memory and suggestibility: The effect of different interviewers on free recall and recognition. *Applied Cognitive Psychology*, 14, 421–433. [http://dx.doi.org/10.1002/1099-0720\(200009\)14:5<421::AID-ACP659>3.0.CO;2-4](http://dx.doi.org/10.1002/1099-0720(200009)14:5<421::AID-ACP659>3.0.CO;2-4).
- Bottoms, B. L., Goodman, G. S., Schwartz-Kenney, B. M., & Thomas, S. N. (2002). Understanding children's use of secrecy in the context of eyewitness reports. *Law and Human Behavior*, 26, 285–313. <http://dx.doi.org/10.1023/A:1015324304975>.
- Brown, M. B., & Forsythe, A. B. (1974). Robust tests for the equality of variances. *Journal of the American Statistical Association*, 69, 364–367. <http://dx.doi.org/10.1080/01621459.1974.10482955>.
- Bruck, M., & Ceci, S. J. (1999). The suggestibility of children's memory. *Annual Review of Psychology*, 50, 419–439. <http://dx.doi.org/10.1146/annurev.psych.50.1.419>.
- Bruck, M., & Ceci, S. J. (2004). Forensic developmental psychology. *Current Directions in Psychological Science*, 13, 229–232. <http://dx.doi.org/10.1111/j.0963-7214.2004.00314.x>.
- Bruck, M., Ceci, S. J., & Hembrooke, H. (1997). Children's reports of pleasant and unpleasant events. In D. Read, & S. Lindsay (Eds.), *Recollections of trauma: Scientific research and clinical practice* (pp. 199–219). New York: Plenum.
- Bruck, M., Ceci, S. J., & Hembrooke, H. (2002). The nature of children's true and false narratives. *Developmental Review*, 22, 520–554. [http://dx.doi.org/10.1016/S0273-2297\(02\)00006-0](http://dx.doi.org/10.1016/S0273-2297(02)00006-0).

- Carrick, N., & Quas, J. A. (2006). Effects of discrete emotions on young children's ability to discern fantasy and reality. *Developmental Psychology*, 42, 1278–1288. <http://dx.doi.org/10.1037/0012-1649.42.6.1278>.
- Cassel, W. S., Roebbers, C. E., & Bjorklund, D. F. (1996). Developmental patterns of eye-witness responses to repeated and increasingly suggestive questions. *Journal of Experimental Child Psychology*, 61, 116–133. <http://dx.doi.org/10.1006/jecp.1996.0008>.
- Ceci, S. J., & Bruck, M. (1993). Suggestibility of the child witness: A historical review and synthesis. *Psychological Bulletin*, 113, 403–439. <http://dx.doi.org/10.1037/0033-2909.113.3.403>.
- Ceci, S. J., Loftus, E. F., Leichtman, M. D., & Bruck, M. (1994). The possible role of source misattributions in the creation of false beliefs among preschoolers. *The International Journal of Clinical and Experimental Hypnosis*, 42, 304–320. <http://dx.doi.org/10.1080/00207149408409361>.
- Ceci, S. J., Ross, D. F., & Toglia, M. P. (1987). Suggestibility of children's memory: Psychological implications. *Journal of Experimental Psychology: General*, 116, 38–49. <http://dx.doi.org/10.1037/0096-3445.116.1.38>.
- Clément, F., Koenig, M., & Harris, P. (2004). The ontogenesis of trust. *Mind & Language*, 19, 360–379. <http://dx.doi.org/10.1111/j.0268-1064.2004.00263.x>.
- Decety, J., & Sommerville, J. A. (2003). Shared representations between self and other: A social cognitive neuroscience view. *Trends in Cognitive Sciences*, 7, 527–533. <http://dx.doi.org/10.1016/j.tics.2003.10.004>.
- Flavell, J. H. (1999). Cognitive development: Children's knowledge about the mind. *Annual Review of Psychology*, 50, 21–45. <http://dx.doi.org/10.1146/annurev.psych.50.1.21>.
- Flavell, J. H. (2004). Theory-of-mind development: Retrospect and prospect. *Merrill-Palmer Quarterly*, 50, 274–290. <http://dx.doi.org/10.1353/mpq.2004.0018>.
- Gardiner, A. K., Greif, M. L., & Bjorklund, D. F. (2011). Guided by intention: Preschoolers' imitation reflects inferences of causation. *Journal of Cognition and Development*, 12, 355–373. <http://dx.doi.org/10.1080/15248372.2010.542216>.
- Garven, S., Wood, J. M., Malpass, R. S. (2000). Allegations of wrongdoing: The effects of reinforcement on children's mundane and fantastic claims. *Journal of Applied Psychology*, 85, 38–49. <http://dx.doi.org/10.1037/0021-9010.85.1.38>.
- 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, 347–359. <http://dx.doi.org/10.1037/0021-9010.83.3.347>.
- Goodman, G. S., & Quas, J. A. (2008). Repeated interviews and children's memory: It's more than just how many. *Current Directions in Psychological Science*, 17, 386–390. <http://dx.doi.org/10.1111/j.1467-8721.2008.00611.x>.
- Hazzard, A., Celano, M., Gould, J., Lawry, S., & Webb, C. (1995). Predicting symptomatology and self-blame among child sex abuse victims. *Child Abuse & Neglect*, 19, 707–714. [http://dx.doi.org/10.1016/0145-2134\(95\)00028-7](http://dx.doi.org/10.1016/0145-2134(95)00028-7).
- Koenig, M. A., & Harris, P. L. (2005). The role of social cognition in early trust. *Trends in Cognitive Sciences*, 9, 457–459. <http://dx.doi.org/10.1016/j.tics.2005.08.006>.
- Kulkofsky, S., & Klemfuss, J. Z. (2008). What the stories children tell can tell about their memory: Narrative skill and young children's suggestibility. *Developmental Psychology*, 44, 1442–1456. <http://dx.doi.org/10.1037/a0012849>.
- Lamb, M. E., & Brown, D. A. (2006). Conversational apprentices: Helping children become competent informants about their own experiences. *British Journal of Developmental Psychology*, 24, 215–234. <http://dx.doi.org/10.1348/026151005X57657>.
- Lamb, M. E., & Fauchier, A. (2001). The effects of question type on self-contradictions by children in the course of forensic interviews. *Applied Cognitive Psychology*, 15, 483–491. <http://dx.doi.org/10.1002/acp.726>.
- Lamb, M. E., La Rooy, D. J., Malloy, L. C., & Katz, C. (2011). *Children's testimony: A handbook of psychological research and forensic practice*, vol. 52. UK: John Wiley & Sons.
- Last, U., & Aharoni-Etzioni, A. (1995). Secrets and reasons for secrecy among school-aged children: Developmental trends and gender differences. *The Journal of Genetic Psychology*, 156, 191–203. <http://dx.doi.org/10.1080/00221325.1995.9914816>.
- Leichtman, M. D., & Ceci, S. J. (1995). The effects of stereotypes and suggestions on preschoolers' reports. *Developmental Psychology*, 31, 568–578. <http://dx.doi.org/10.1037/0012-1649.31.4.568>.
- Lewis, M., Stanger, C., & Sullivan, M. W. (1989). Deception in 3-year-olds. *Developmental Psychology*, 25, 439–443. <http://dx.doi.org/10.1037/0012-1649.25.3.439>.
- Lindsay, D. S., Johnson, M. K., & Kwon, P. (1991). Developmental changes in memory source monitoring. *Journal of Experimental Child Psychology*, 52, 297–318. [http://dx.doi.org/10.1016/0022-0965\(91\)90065-Z](http://dx.doi.org/10.1016/0022-0965(91)90065-Z).
- Lyon, T. D., & Dorado, J. S. (2008). Truth induction in young maltreated children: The effects of oath-taking and reassurance on true and false disclosures. *Child Abuse & Neglect*, 32, 738–748. <http://dx.doi.org/10.1016/j.chiabu.2007.08.008>.
- Lyon, T. D., Malloy, L. C., Quas, J. A., & Talwar, V. A. (2008). Coaching, truth induction, and young maltreated children's false allegations and false denials. *Child Development*, 79, 914–929. <http://dx.doi.org/10.1111/j.1467-8624.2008.01167.x>.
- Lyon, T. D., Wandrey, L., Ahern, E., Licht, R., Sim, M. P., & Quas, J. A. (2014). Eliciting maltreated and nonmaltreated children's transgression disclosures: Narrative practice rapport building and a putative confession. *Child Development*, 85, 1756–1769. <http://dx.doi.org/10.1111/cdev.12223>.
- Ohbuchi, K., & Sato, K. (1994). Children's reactions to mitigating accounts: Apologies, excuses, and intentionality of harm. *The Journal of Social Psychology*, 134, 5–17. <http://dx.doi.org/10.1080/00224545.1994.9710877>.
- Perner, J. (1988). Developing semantics for theories of mind: From propositional attitudes to mental representation. In J. Astington, P. L. Harris, & D. Olson (Eds.), *Developing theories of mind* (pp. 141–172). Cambridge: Cambridge University Press.
- Perner, J., & Lang, B. (1999). Development of theory of mind and executive control. *Trends in Cognitive Sciences*, 3, 337–344. [http://dx.doi.org/10.1016/S1364-6613\(99\)01362-5](http://dx.doi.org/10.1016/S1364-6613(99)01362-5).
- Polak, A., & Harris, P. L. (1999). Deception by young children following noncompliance. *Developmental Psychology*, 35, 561–568. <http://dx.doi.org/10.1037/0012-1649.35.2.561>.
- Poole, D. A., & Lindsay, D. S. (1995). Interviewing preschoolers: Effects of nonsuggestive techniques, parental coaching, and leading questions on reports of nonexperienced events. *Journal of Experimental Child Psychology*, 60, 129–154. <http://dx.doi.org/10.1006/jecp.1995.1035>.
- Quas, J. A., Goodman, G. S., & Jones, D. P. (2003). Predictors of attributions of self blame and internalizing behavior problems in sexually abused children. *Journal of Child Psychology and Psychiatry*, 44, 723–736. <http://dx.doi.org/10.1111/1469-7610.00158>.
- Quas, J. A., Malloy, L. C., Melinder, A., Goodman, G. S., D'Mello, M., & Schaaf, J. (2007). Developmental differences in the effects of repeated interviews and interviewer bias on young children's event memory and false reports. *Developmental Psychology*, 43, 823–837. <http://dx.doi.org/10.1037/0012-1649.43.4.823>.
- Roberts, K. P., & Blades, M. (2000). *Children's source monitoring*. New York: Psychology Press.
- Roberts, K. P., & Powell, M. B. (2001). Describing individual incidents of sexual abuse: A review of research on the effects of multiple sources of information on children's reports. *Child Abuse & Neglect*, 25, 1643–1659. [http://dx.doi.org/10.1016/S0145-2134\(01\)00290-3](http://dx.doi.org/10.1016/S0145-2134(01)00290-3).
- Ross, H., Smith, J., Spielmacher, C., & Recchia, H. (2004). Shading the truth: Self-serving biases in children's reports of sibling conflicts. *Merrill-Palmer Quarterly*, 50, 61–85. <http://dx.doi.org/10.1353/mpq.2004.0005>.
- Salzinger, K. (1959). Experimental manipulation of verbal behavior: A review. *The Journal of General Psychology*, 61, 65–94. <http://dx.doi.org/10.1080/00221309.1959.9710241>.
- Samuels, A., & Taylor, M. (1994). Children's ability to distinguish fantasy events from real-life events. *British Journal of Developmental Psychology*, 12, 417–427. <http://dx.doi.org/10.1111/j.2044-835X.1994.tb00644.x>.
- Scullin, M. H., & Ceci, S. J. (2001). A suggestibility scale for children. *Personality and Individual Differences*, 30, 843–856. [http://dx.doi.org/10.1016/S0191-8869\(00\)00077-5](http://dx.doi.org/10.1016/S0191-8869(00)00077-5).
- Stein, N. L., & Levine, L. J. (1999). The early emergence of emotional understanding and appraisal: Implications for theories of development. In T. Dalgleish, & M. Power (Eds.), *Handbook of cognition and emotion* (pp. 383–408). Chichester, England: John Wiley & Sons.
- Talwar, V., Gordon, H. M., & Lee, K. (2007). Lying in the elementary school years: Verbal deception and its relation to second-order belief understanding. *Developmental Psychology*, 43, 804–810. <http://dx.doi.org/10.1037/0012-1649.43.3.804>.
- Talwar, V., & Lee, K. (2002). Development of lying to conceal a transgression: Children's control of expressive behavior during verbal deception. *International Journal of Behavioral Development*, 26, 436–444. <http://dx.doi.org/10.1080/01650250143000373>.
- Taylor, M., Cartwright, B. S., & Bowden, T. (1991). Perspective taking and theory of mind: Do children predict interpretive diversity as a function of differences in observers' knowledge? *Child Development*, 62, 1334–1351. <http://dx.doi.org/10.1111/j.1467-8624.1991.tb01609.x>.
- Tharp, R. G., & Wetzel, R. J. (1969). *Behavior modification in the natural environment*. New York: Academic Press, 120–135.
- Tobey, A. E., & Goodman, G. S. (1992). Children's eyewitness memory: Effects of participation and forensic context. *Child Abuse & Neglect*, 16, 779–796. [http://dx.doi.org/10.1016/0145-2134\(92\)90081-2](http://dx.doi.org/10.1016/0145-2134(92)90081-2).
- Tye, M. C., Amato, S. L., Honts, C. R., Devitt, M. K., & Peters, D. (1999). The willingness of children to lie and the assessment of credibility in an ecologically relevant laboratory setting. *Applied Developmental Science*, 3, 92–109. http://dx.doi.org/10.1207/s1532480xads0302_4.
- Wilcox, R. R. (1987). New designs in analysis of variance. *Annual Review of Psychology*, 38, 29–60. <http://dx.doi.org/10.1146/annurev.ps.38.020187.000333>.
- Wilson, A. E., Smith, M. D., & Ross, H. S. (2003). The nature and effects of young children's lies. *Social Development*, 12, 21–45. <http://dx.doi.org/10.1111/1467-9507.00220>.
- Wilson, A. E., Smith, M. D., Ross, H. S., & Ross, M. (2004). Young children's personal accounts of their sibling disputes. *Merrill-Palmer Quarterly*, 50, 39–60. <http://dx.doi.org/10.1353/mpq.2004.0008>.
- Woolley, J. D. (1997). Thinking about fantasy: Are children fundamentally different thinkers and believers from adults? *Child Development*, 68, 991–1011. <http://dx.doi.org/10.1111/j.1467-8624.1997.tb01975.x>.
- Zaragoza, M. S., & Lane, S. M. (1994). Source misattributions and the suggestibility of eyewitness memory. *Journal of Experimental Psychology Learning Memory and Cognition*, 20, 934–945. <http://dx.doi.org/10.1037/0278-7393.20.4.934>.