Testing a new approach to improve recall in different ages

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Testing a New Approach to Improve Recall in Different Ages: Providing Witnesses With a Model Statement

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Obtaining an elaborate witness statement is essential for police investigations. Free recall, however, sometimes lacks richness of detail, especially in younger witnesses. Drawing from deception detection and educational psychological literature, we tested the beneficial value of a model statement to enhance recall quantity without decreasing accuracy in 48 adults (Experiment 1), and in 110 7- to 10-year-old children and 14- to 17-year-old adolescents (Experiment 2). Participants either listened to an unrelated account (i.e., model statement) or performed a filler task prior to recalling a target event witnessed 1 week earlier. We replicated age increases in statement quantity and age-related decreases to suggestive follow-up questions. No effect of model statement was found. Reasons for why a model statement was ineffective and recommendations are discussed.

What is the significance of this article for the general public?

This study tested if providing child, adolescent, and adult witnesses with a statement that gives them an idea about what to report (richness of detail, admitting knowledge gaps, etc.), may help them to give more detailed accounts. For now, model statements have not proven to facilitate retrieval. Legal researchers should investigate if active versus passive involvement causes diverging findings with other memory facilitating techniques such as practicing a narrative.

Keywords: eyewitness memory, child witnesses, misinformation, practice narrative, learning by example

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Legal professionals generally strive to receive complete and accurate statements from witnesses. Witness statements do not, however,

always meet these demands (Fisher & Geiselman, 2010). Some details of the witnessed event might be omitted or distorted, and it is therefore

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important to assist witnesses in their event recall. The current experiments test a promising new instrument that might improve recall quantity without decreasing accuracy in witnesses of different age, namely the introduction of a model statement.

Witnesses do not give a literal account of what they experienced. This is because memory is reconstructive, malleable, and easily affected by suggestive influences (e.g., Loftus, 2005). Incorrect information can slip into eyewitness testimonies, and indeed, an abundance of research has demonstrated the plasticity of memory in response to misleading external information (i.e., the *misinformation effect*; Loftus, 2005). Suggestive question styles that are leading (“You will feel better after telling me what he did to you”), imply the desired answer (“You have seen a black man, right?”), or put doubt on a previous response (“Are you sure that it happened like this?”), and the exposure to erroneous information may distort memory profoundly. The McMartin Preschool and Kelly Michaels day-care abuse cases, as well as several *recovered* memory cases, are prominent examples in which poor quality suggestive interviews were performed (Loftus, 1993; Schreiber et al., 2006).

Given the obvious perils that suggestive interviewing techniques exert on memory, it should be acknowledged that interviewing witnesses is a challenging task. In general, interviewers do not intentionally pose suggestive questions, but witnesses and victims are not necessarily talkative when asked to recall everything they remember, and legal practitioners typically work under time pressure. If a witness does not deliver information voluntarily during an interview, police frequently revert to using specific questions (e.g., Lamb et al., 2003). Posing cued and closed questions, however, may distort eyewitness memory, especially for vulnerable witnesses such as children (Bull, 2010). Free recall accounts result in the most accurate statements and are therefore recommended in interviewing contexts (Lamb, Hershkowitz, Orbach, & Esplin, 2008).

However, free recall accounts are often incomplete and do not include all information that a witness has encoded. These *omission errors* may be due to underlying beliefs or uncertainties of the witness about how and what to report during an interview (Larsson & Lamb, 2009).

Consequently, interview methods typically aim to enhance the completeness and accuracy of reports. Examples of memory-enhancing methods can be found in structured interview protocols such as the National Institute of Child Health and Human Development Investigative Interviewing (NICHHD) Protocol (Lamb et al., 2008) or the *cognitive interview* (Fisher & Geiselman, 1992). Both protocols begin with informal rapport building and setting ground rules of the interview before continuing with the witnessed event. Recall starts with free recall prompts (“Please tell me everything you know”—“Tell me more about that”) and only continues with more targeted, nonmisleading questions when the interviewee indicates to have completed the account. Bearing in mind the danger of posing suggestive questions, it is desirable to elicit as much correct information as possible in the free recall phase.

Although these protocols elicit complete and accurate accounts (Lamb, Orbach, Hershkowitz, Esplin, & Horowitz, 2007; Memon, Meissner, & Fraser, 2010), they frequently cannot accommodate for witnesses and/or victims that provide scarce statements (e.g., child witnesses) at baseline. One promising method to enhance statement quantity in the free recall phase stems from the deception detection literature. In a recent study, Leal, Vrij, Warmelink, Vernham, and Fisher (2015; Study 2) examined whether listening to a model statement prior to making an insurance claim would facilitate discriminability between truth tellers and liars by eliciting potential cues to detect deceit. Claimants listened to an unrelated account of a motor race visit given by an unknown person as a model for their own account. Providing a model statement that had no connection to the later recalled target event opposed to merely asking open-ended questions not only facilitated the discriminability between truth tellers and liars, but also led to longer and more detailed statements. A follow-up study (Bogaard, Meijer, & Vrij, 2014) again demonstrated the enhancing effect on statement quantity and informative cues (although lie detection was not eased). Furthermore, the authors emphasized the easiness of implementing such an intervention, which gives the interviewee an idea on how and what to report in the free recall phase, in real forensic interviews.

The use of a model statement could therefore be a rather simple and time-efficient way to enhance statement quantity without decreasing accuracy. Even though model statements were originally tested with the purpose of eliciting cues to detect deceit in adults suspected of a crime, it also has the potential for enhancing statement quantity during investigative interviews of witnesses or victims. This is true for cooperative witnesses who (unintentionally) omit details and very young witnesses who both often may lack an understanding of how much detail is expected of them. The idea behind the beneficial impact of a model statement on statement quantity and accuracy has not only been suggested in deception detection research, but also in the educational psychology literature (e.g., knowledge about learning in a school or parental context). Specifically, studies showed that being provided with an example (cf. passive exposure to instructions) enables learners to better understand what is expected of them (e.g., Renkl, 2014; van Gog & Rummel, 2010).

These results on learning by example (i.e., *modeling*) suggest that providing witnesses with a model statement that contains all the ingredients of an “ideal” statement (e.g., many details, references to sound, visual and contextual details, etc.) may enable them to grasp what is expected, resulting in a boost in recall quantity without decreasing accuracy. Note that practicing a free recall account by means of prompts to provide a statement about a neutral and unrelated experienced event before witnesses are interviewed about the target event is a tool included in the NICHD protocol (Brown et al., 2013) and other interview guidelines such as the *Memorandum of Good Practice* (Davies & Westcott, 1999) and the American Professional Society on the Abuse of Children (APSAC; American Professional Society on the Abuse of Children, 2012) guideline. The parallel between such a *practice narrative* and the use of a model statement is that in both approaches, witnesses learn what is expected from them, and this positively affects their retrieval performance. Field research using practice narratives revealed that children provided longer statements about alleged abuse when they previously reported about a recently experi-

enced neutral event (Price, Roberts, & Collins, 2013).

Unfortunately, police officers omit the practice narrative in a majority of analyzed field interviews with children (65%; Price et al., 2013). Reasons for the reluctance to use practice narratives include difficulty in choosing an appropriate unrelated topic, worries about wasting time that could better be used to interview the child about the event under investigation, and doubts of the added value (Price et al., 2013; Roberts, Brubacher, Powell, & Price, 2011). Providing a prerecorded model statement might overcome these practical concerns as no direct input of the interviewer is needed. From an applied perspective, model statements might be more likely to be implemented in interviewing settings than practice narratives because passively listening to a prerecorded model statement might be less demanding for interviewers/interviewees than actively partaking in a dialogue about an unrelated event.

In the current paper, we examined the possible benefit of using a model statement to facilitate eyewitness memory in both adult (Experiment 1) and child and adolescent participants (Experiment 2). The latter constitute a group that often needs extra support when providing a statement and that is especially prone to comply with misleading interviewing techniques (e.g., Bull, 2010). Roughly half of our participants were presented with a model statement referring to an unrelated event while the other half were not. We hypothesized that participants in the model statement condition would outperform their counterparts in the no-model condition for number of correct details without decreasing accuracy of the witness report (Bogaard et al., 2014; Leal et al., 2015). Given that older children or adults are better able to provide a comprehensive free recall account, we also predicted greater improvement of statement quantity for younger children in Experiment 2 (e.g., Lamb, Sternberg, & Esplin, 2000; Nelson & Fivush, 2004). Furthermore, children are more often exposed to modeling in everyday life (during encounters with peers and adults) than adults (Renkl, 2014; van Gog & Rummel, 2010). Therefore, we expected that children would more readily incorporate the

model statement as an example for their own statement than older participants.

Experiment 1

Participants

Forty-eight adults (10 men, 19–39 years, $M = 22.61$, $SD = 3.27$), took part in both sessions of Experiment 1. Three additional participants only showed up for Session 1 (± 1 day; dropout rate 5.88%). An *a priori* power analysis with a power of .80 and an estimated medium effect size of $d = 0.70$ resulted in a sample size of 52. This is a conservative estimate of the required sample because previous effect sizes were large. Participants were mainly second-year university students who received course credit in return for participation.

Materials

Stimulus video. A 1:17-min video fragment of a mock crime depicting the ostensible theft of a camera served as stimulus film.

Model statement. A 2:31-min audiotope was used as model statement. A speaker described a true event of having witnessed a group of teenagers spray graffiti on a wall.

Recall prompts. A free-recall invitation (“Tell me everything you remember from the beginning to the end”) was used to elicit an unbiased statement of the witnessed event. When participants had finished their account, more specific cued questions followed (see online Appendix for a script of the cued questions). All participants received structured interview questions concerning the appearance of persons, actions, and surroundings.

Design and Procedure

Participants were randomly assigned to the *model statement* or *no-model statement* condition ($n = 24$). The experiment was conducted in English and consisted of two sessions with a delay of 1 week (± 1 day; $M = 7.04$, $SD = 0.90$). Participants’ statements were audio recorded and transcribed after the second session.

The first session lasted approximately 10 min. Participants received information about the purpose of the study (to test ways to enhance recall quantity) and watched the stimulus film. In session two, 1 week later, half of the partic-

ipants listened to the model statement with the information that it was an illustration of a witness statement, while the other half performed an unrelated filler-task (playing Tetris). Next, participants were asked to provide a detailed account of the content of the video. Participants were informed that they could respond “don’t know” when they were unsure about something. When participants finished their account, the experimenter continued with the structured interview questions. Finally, participants were debriefed and asked to keep the content of the experiment to themselves. The second session lasted approximately 30 min.

Coding of Statements

Five transcribed statements were randomly selected and independently coded by seven coders with a preliminary coding protocol. Any disagreement was discussed afterward, and the coding protocols were adjusted accordingly. This procedure resulted in a free-recall coding protocol that included 82 items and a protocol for the structured interview questions that included 64 possible statements. The item values were mutually exclusive (an item was either recalled correctly, incorrectly, or not mentioned). Commissions were also coded. Additionally, the word count of the transcribed statement was established. All 48 transcripts were independently coded by at least two of seven coders. Again, disagreements were resolved in discussion. There were no significant differences between coders or experimenters who conducted the interviews in respect to interview quantity and number of correct items per condition (all p values $> .05$). To determine inter-coder reliability, 23% ($n = 11$) of the statements were randomly selected and coded by the first author who was blind to the condition. Cohen’s K on item-level was found to be almost perfect for free-recall (.85) as well as for cued questions (.81; Landis & Koch, 1977).

Results

Free recall: Statement quantity. We ran a Mann–Whitney’s U test to analyze if the statement quantity of the free recall report differed as a function of listening to a model statement. A nonparametric sample t test was used because of violation of the normality assumption. Total word count ranged from 78 to 316 ($Mdn =$

154.00) in the no-model statement condition and from 114 to 439 ($Mdn = 169.50$) in the model statement condition. Free recall quantity in the model statement condition (mean rank = 27.29) did not statistically significantly differ from free recall quantity in the no-model statement condition (mean rank = 20.57), $U = 355$, $z = 1.682$, $p = .093$, $r = .25$. The data were also examined by estimating a Bayes factor, which was found to be $BF_{10} = 0.71$ indicating that our data are more in support of the null than the alternative hypothesis.

Free recall: Statement accuracy. In addition to the number of correct details, incorrect details, and total accuracy (proportion of correctly recalled items relative to the total number of recalled items), the number of missing details were compared between groups. The top part of Table 1 depicts the descriptive and inferential statistics of the outcome values. Contrary to our expectations, model statement condition did not have an effect on correct details, incorrect details, or missing details, all p values $\geq .685$. Bayes factor scores (BF_{10}) ranged from 0.29 to 0.31, indicating that our data were more likely in support of the null than alternative hypothesis.

Cued questions: Statement accuracy. Analogous outcome variables as described in the free recall section above were used. The bottom part of Table 1 depicts the descriptive and inferential statistics of the outcome values. Listening to a model statement compared with not listening to a model statement did not have an effect on correct details, incorrect details,

missing details, or accuracy, all p values $\geq .507$. Bayes factor scores (BF_{10}) ranged from 0.29 to 0.35, suggesting that our data were more in support of the null than the alternative hypothesis.

Discussion

Experiment 1 was designed to determine whether listening to a model statement would benefit adults when making witness statements, compared with a control condition. In contrast to previous studies (Bogaard et al., 2014; Leal et al., 2015), we did not find a beneficial effect of presenting a model statement. One explanation for this finding may relate to our sample's age. Based on the relative inferiority of testimony provided by children, we expected younger participants to be more likely to benefit from a model statement than adults. In Experiment 2, using a design analogous to Experiment 1, we tested children and adolescents using a more ecologically valid target event—a staged crime. As an exploratory aim, in Experiment 2, we also included some misleading questions in the cued question section. The rationale behind this adjustment to the method was twofold. One reason is the growing body of experiments that study the effect of recall enhancing interventions on suggestibility to misinformation and the possible detrimental effects associated with it (e.g., Brackmann, Otgaar, Sauerland, & Howe, 2016). The other reason is that suggestibility to misleading information is a

Table 1
Descriptive and Inferential Statistics of Outcome Scores for Free Recall and Cued Questions as a Function of Model Statement Condition (Experiment 1)

	No-model statement		Model statement		<i>t</i> (46)	<i>p</i>	<i>r</i>
	<i>M</i> (<i>SD</i>)	95% CI	<i>M</i> (<i>SD</i>)	95% CI			
Free recall							
Correct details	17.58 (6.25)	[14.94, 20.22]	18.25 (4.99)	[16.14, 20.36]	−.41	.685	.06
Incorrect details	1.79 (1.35)	[1.22, 2.36]	1.83 (1.61)	[1.16, 2.51]	−.10	.923	.01
Missing details	62.58 (6.95)	[59.65, 65.52]	61.92 (5.87)	[59.44, 64.39]	.36	.721	.05
Accuracy	.91 (.06)	[.88, .94]	.92 (.07)	[.89, .95]	−.40	.688	.06
Cued questions							
Correct details	26.13 (5.94)	[23.62, 28.63]	26.92 (5.66)	[24.53, 29.31]	−.47	.639	.07
Incorrect details	5.04 (2.40)	[4.03, 6.06]	5.54 (2.90)	[4.32, 6.77]	−.65	.519	.10
Missing details	31.83 (6.97)	[28.90, 34.78]	30.54 (6.40)	[27.84, 33.24]	.67	.507	.10
Accuracy	.84 (.06)	[.81, .84]	.83 (.08)	[.80, .87]	.37	.717	.05

Note. CI = confidence interval.

problem especially in children (Bruck & Ceci, 1999).

Experiment 2

Participants

One-hundred-and-ten participants, consisting of 60 children (28 male, 7–10 years, $M = 8.60$, $SD = 0.72$) and 50 adolescents (28 male, 14–17 years, $M = 16.09$, $SD = 0.73$) took part in Experiment 2. An a priori power analysis with a power of .80 and an estimated medium effect size ($f = .30$) resulted in a sample size of 90. The experiment took place at the participant's schools. Prior to testing, school principals provided approval and parents provided consent.

Materials

Staged event. Participants witnessed a staged live event depicting the theft of a wallet. Two confederate amateur actors who were unknown to the participants enacted the scene. Each performance in front of the pupils was video recorded. The staged event lasted approximately 10 min. At the beginning of the staged event, the class teacher announced the arrival of a researcher who wanted to inform the pupils about a study that was going to be conducted the week thereafter. Then actor 1, a blond woman, started introducing herself and explaining the ostensible purpose of the study. Interest in the pupil's opinions about school activities served as a cover story. While actor 1 told the children about her own experiences with school activities, the eavesdropping person called actor 1 on her cell phone. Actor 1 interrupted her speech, informed the pupils that she needed to answer the call, and left the classroom. Shortly after, actor 2, a dark-haired woman, entered the room. She pretended to have forgotten her wallet in actor one's handbag, rummaged in it, and left the classroom again with a wallet in hand. When actor 1 returned into the classroom (about 30 sec. later), she was still on the phone, told the pupils that she urgently had to leave, grabbed the camera, and left.

Model statement. An audiotape describing having witnessed a soccer game in which a player purposely hurt another player was used as model statement. The event was a recall by a peer of comparable age. The original event was

described by a boy (10 years) who was instructed to give a detailed account of a self-experienced, recent, short event that had a clear beginning and end. To enable the older age-group to identify with the speaker of the model statement as well, the same account was recorded by a young adult woman (21 years). The model statement for child participants lasted 2:18 min and for adolescents 1:59 min.

Recall prompts. The recall prompts were analogous to Experiment 1 (first a free-recall instruction followed by more specific cued questions). The cued questions differed in content and, in addition to the procedure in Experiment 1, included some misleading questions (five in total; see online Appendix for a script of the cued questions).

Design and Procedure

The study used a 2 (Age: Children vs. adolescents) $\times$ 2 (Model statement: Model statement vs. no model statement) between-subjects design. Participants were randomly assigned to the model statement conditions; model statement condition: $n_{children} = 31$ ($M = 8.57$, $SD = 0.60$), $n_{adolescents} = 22$ ($M = 16.14$, $SD = 0.79$); no-model statement condition: $n_{children} = 29$ ($M = 8.64$, $SD = 0.84$), $n_{adolescents} = 28$ ($M = 16.06$, $SD = 0.68$).

The experiment consisted of two sessions with a delay of one week (± 1 day; $M = 7.11$, $SD = 0.31$) in between. The staged event was performed in front of the entire class. Individual interview sessions took place in quiet rooms at the school with only the experimenter and participant being present. Participants' free-recall statements were audio recorded and literally transcribed after the second session. The entire experiment was conducted in Dutch. The participants as well as interviewers were all native speakers. Verbal consent was obtained from participants before the second session. After the whole class had been tested, pupils were debriefed and thanked for their participation with a candy bar.

During the first session, the actors performed the live staged event. It was ensured that the actors were not seen together at any time and that the participants remained naive to the true purpose of the study. One week later, two or three different interviewers returned to the school and informed participants that the focus

of the study had changed due to the unexpected event of the wallet theft, and questions about the theft would therefore be asked. Before continuing to the interview, participants either listened to the model statement or performed an unrelated filler-task (spot the differences) for the same period of time. Participants received a general instruction, which asked for a full and detailed account of the wallet theft. After participants completed their account, the experimenter continued with the structured interview questions. At the end of the session, participants were asked to keep the content of the experiment to themselves until the whole class had been asked about the event by the end of the day. The second session lasted approximately 10 min.

Coding of Statements

A similar approach as in Experiment 1 was used to code the interviews. There was no statistically significant difference between coders or experimenters who conducted the interviews in respect to interview quantity and number of correct items per condition (all p values $> .05$). Inter-coder reliability (Cohen's K) between the two coders on item-level was established by coding 25% ($n = 27$) of the statements and found to be almost perfect for free-recall (.96) and cued questions (.93; Landis & Koch, 1977).

Results

Free recall: Statement quantity. We ran a 2 (Age: Children vs. adolescents) $\times$ 2 (Model statement: Model statement vs. no model statement) factorial analysis of variance (ANOVA) to analyze if the statement quantity of the free recall report differed between children and adolescents across model statement conditions. There was no statistically significant interaction between age and condition for statement quantity, $F(1, 106) = 0.16, p = .687, \eta_p^2 < .01$, and no main effect of condition, $F(1, 106) = 0.84, p = .362, \eta_p^2 = .01$. There was a statistically significant main effect of age, $F(1, 106) = 15.27, p < .001, \eta_p^2 = .13$, showing that children spoke fewer words than adolescents (see superscript a in Table 2 for the descriptive statistics).

Free recall: Statement accuracy. Multiple ANOVAs (Bonferroni corrected) with the number of correct details, incorrect details, total

accuracy, and number of missing details as dependent variables (see Table 2 for the descriptive statistics) revealed no interaction effect between age and model statement condition, all p values $\geq .668$, and no main effect of model statement condition, all p values $\geq .401$. Bayes factors suggested that the data were more in favor of the null than alternative hypothesis: $BF_{10s} < 0.77$. Some main effects of age, on the other hand, were statistically significant. Age differences were absent for incorrect details, $F(1, 106) = 0.81, p = .370, \eta_p^2 = .01$, and total accuracy, $F(1, 106) = 0.72, p = .400, \eta_p^2 = .01$. Statistically significant age differences emerged for correct (see superscript b), $F(1, 106) = 27.77, p < .001, \eta_p^2 = .21$, and missing details (superscript c), $F(1, 106) = 27.43, p < .001, \eta_p^2 = .21$. Children reported fewer correct details and were more likely to not report information than adolescents.

Cued questions: Nonmisleading questions.

Analyses analogous to the free recall section were performed for the nonmisleading cued questions (Table 3 displays the descriptives). There was no interaction effect between age and model statement condition, all p values $\geq .229$, and no main effect of model statement condition, all p values $\geq .362$. Some main effects of age were again significant: Age differences were absent for correct details, $F(1, 106) = 1.69, p = .196, \eta_p^2 = .02$, but statistically significant for incorrect details (see superscript a), $F(1, 106) = 33.26, p < .001, \eta_p^2 = .24$, missing details (superscript b), $F(1, 106) = 12.80, p = .001, \eta_p^2 = .11$, and total accuracy (superscript c), $F(1, 106) = 10.86, p = .001, \eta_p^2 = .09$.

Cued questions: Misleading questions.

The proportion of questions that were answered into the direction of the suggestion relative to the number of misleading questions served as dependent variable in a two-way ANOVA testing the effect of misleading questions on age (Table 3 displays the descriptives). There was no statistically significant interaction between age and model statement condition for misleading questions, $F(1, 106) = 1.76, p = .188, \eta_p^2 = .02$, or main effect of condition, $F(1, 106) = 0.02, p = .893, \eta_p^2 < .01$. There was, however, a statistically significant main effect of age, $F(1, 106) = 7.44, p = .007, \eta_p^2 = .07$, indicating that children were more susceptible to suggestion than adolescents (see superscript d).

Table 2
Descriptive Statistics of Outcome Scores for Free-Recall as a Function of Model Statement Condition and Age (Experiment 2)

	No-model statement		Model statement		Both conditions	
	<i>M</i> (<i>SD</i>)	95% CI	<i>M</i> (<i>SD</i>)	95% CI	<i>M</i> (<i>SD</i>)	95% CI
Children						
Statement quantity	113.00 (61.53)	[89.60, 136.40]	135.29 (88.77)	[102.73, 167.85]	124.52 (77.01) ^a	[104.62, 144.41]
Correct details	10.17 (3.67)	[8.78, 11.57]	10.97 (4.31)	[9.39, 12.55]	10.58 (4.00) ^b	[9.55, 11.62]
Incorrect details	.69 (1.00)	[.31, 1.07]	.77 (.84)	[.46, 1.08]	.73 (.92)	[.50, .97]
Missing details	59.14 (3.79)	[57.70, 60.58]	58.26 (4.56)	[56.59, 59.93]	58.68 (4.19) ^c	[57.60, 59.77]
Accuracy	.94 (.09)	[.91, .96]	.93 (.07)	[.91, .96]	.94 (.08)	[.92, .96]
Adolescents						
Statement quantity	185.82 (101.26)	[146.56, 225.08]	194.45 (97.12)	[151.39, 237.52]	189.62 (98.54) ^a	[161.61, 217.63]
Correct details	16.46 (7.70)	[13.48, 19.45]	17.23 (8.54)	[13.44, 21.01]	16.80 (8.01) ^b	[14.52, 19.08]
Incorrect details	.78 (.88)	[.45, 1.13]	1.05 (1.53)	[.37, 1.72]	.90 (1.20)	[.56, 1.24]
Missing details	52.75 (7.74)	[49.75, 55.75]	51.73 (9.05)	[47.72, 55.74]	52.30 (8.27) ^c	[49.95, 54.65]
Accuracy	.95 (.06)	[.93, .97]	.95 (.07)	[.92, .98]	.95 (.07)	[.93, .97]
Across ages						
Statement quantity	148.77 (90.47)	[124.77, 172.78]	159.85 (96.03)	[133.38, 186.32]	154.11 (92.93)	[136.55, 171.67]
Correct details	13.26 (6.74)	[11.48, 15.05]	13.57 (7.06)	[11.62, 15.51]	13.41 (6.86)	[12.11, 14.71]
Incorrect details	.74 (.94)	[.49, .99]	.89 (1.17)	[.56, 1.21]	.81 (1.05)	[.61, 1.01]
Missing details	56.00 (6.81)	[54.19, 57.81]	55.55 (7.46)	[53.49, 57.60]	55.78 (7.10)	[54.44, 57.12]
Accuracy	.95 (.08)	[.92, .97]	.94 (.07)	[.92, .96]	.94 (.07)	[.93, .96]

Note. CI = confidence interval. Rows or columns sharing the same superscript letter differ significantly ($p < .05$; see main text for inferential statistics).

Table 3

Descriptive Statistics of Outcome Scores for Cued Questions as a Function of Model Statement Condition and Age (Experiment 2)

	No-model statement		Model statement		Both conditions	
	<i>M</i> (<i>SD</i>)	95% CI	<i>M</i> (<i>SD</i>)	95% CI	<i>M</i> (<i>SD</i>)	95% CI
Children						
Correct details	7.74 (1.73)	[7.11, 8.38]	7.41 (2.37)	[6.51, 8.31]	7.58 (2.05)	[7.05, 8.11]
Incorrect details	2.06 (1.31)	[1.58, 2.55]	1.72 (1.07)	[1.32, 2.13]	1.90 (1.20) ^a	[1.59, 2.21]
Missing details	1.19 (1.14)	[.78, 1.61]	1.86 (2.17)	[1.04, 2.69]	1.52 (1.73) ^b	[1.07, 1.96]
Accuracy	.79 (.14)	[.73, .84]	.80 (.16)	[.74, .87]	.80 (.15) ^c	[.76, .83]
Suggestibility	.39 (.28)	[.28, .49]	.32 (.30)	[.21, .44]	.36 (.29) ^d	[.28, .43]
Adolescents						
Correct details	6.77 (3.26)	[5.33, 8.22]	7.07 (3.09)	[5.87, 8.27]	6.94 (3.14)	[6.05, 7.83]
Incorrect details	.68 (.65)	[.40, .97]	.82 (.86)	[.49, 1.16]	.76 (.77) ^a	[.54, .98]
Missing details	3.55 (3.39)	[2.04, 5.05]	3.11 (3.40)	[1.79, 4.43]	3.30 (3.37) ^b	[2.34, 4.26]
Accuracy	.88 (.21)	[.78, .97]	.91 (.09)	[.88, .95]	.90 (.16) ^c	[.85, .94]
Suggestibility	.17 (.20)	[.08, .26]	.25 (.29)	[.14, .36]	.22 (.25) ^d	[.14, .29]
Across ages						
Correct details	7.34 (2.50)	[6.65, 8.03]	7.25 (2.73)	[6.52, 7.97]	7.29 (2.61)	[6.80, 7.78]
Incorrect details	1.49 (1.28)	[1.14, 1.84]	1.28 (1.06)	[1.00, 1.56]	1.38 (1.17)	[1.16, 1.60]
Missing details	2.17 (2.60)	[1.45, 2.89]	2.47 (2.89)	[1.71, 3.24]	2.33 (2.74)	[1.81, 2.85]
Accuracy	.82 (.18)	[.77, .87]	.86 (.14)	[.82, .89]	.84 (.16)	[.81, .87]
Suggestibility	.30 (.27)	[.22, .37]	.29 (.30)	[.21, .37]	.29 (.28)	[.24, .35]

Note. CI = confidence interval. Rows or columns sharing the same superscript letter differ significantly ($p < .05$; see main text for inferential statistics).

Discussion

Experiment 2 was designed to assess the usefulness of a model statement in a sample of witnesses that are known to require extra support when asked to provide a free recall account, namely children and adolescents. We anticipated that younger children would profit more from the model statement intervention as compared with older participants (adolescents). This assumption was based on findings about age increases in the development of autobiographical memory and the ability to provide a free recall account (Nelson & Fivush, 2004) as well as responsiveness to modeling (Renkl, 2014; van Gog & Rummel, 2010). We replicated a general increase in statement quantity that was unrelated to the model statement condition. Statements of adolescent participants were 1/3 longer than statements of child participants. Furthermore, as expected, children were more likely to fall prey to misleading questions. Unexpectedly, however replicating Experiment 1, listening to a model statement had no effect on statement quantity or accuracy, compared with a no-model statement condition.

General Discussion

The present paper examined the possible recall enhancing effect of a model statement on eyewitnesses of different ages. To this end, participants viewed a forensically relevant target event (video or staged event of a theft), listened to a detailed model statement of an unrelated event or performed a filler task after a delay of approximately 1 week, and finally gave a witness report. Most importantly, and in contrast to earlier findings in which listening to a model statement produced longer statements (Bogaard et al., 2014; Leal et al., 2015), the model statement did not enhance eyewitness statements. Furthermore, we replicated an age increase in statement quantity and an age decrease in suggestibility to misleading questions.

Delineating the results in more detail, we found the following. First, and of most relevance for the current experiments, in our adult sample (Experiment 1), the model statement manipulation did not affect statement quantity or accuracy (in free recall or cued questions). The same pattern emerged in our child and adolescent sample (Experiment 2), in which the

model statement manipulation neither interacted with age nor was there a main effect. Prior work on modeling and practice narratives indicates that, when participants are provided with an example of what is expected from them or have the possibility to practice these demands, subsequent performance of the learned task increases (Renkl, 2014; Price et al., 2013; van Gog & Rummel, 2010). According to Bandura's (1977, 1986) social learning analysis, observational learning only transpires when the learner (1) pays attention to the model, (2) possesses the memory capacities to retain the information, (3) has the ability to reproduce the encoded information, and (4) is motivated to map the learned behavior. It is possible that at least one of these processes was not effectively induced by our model statement manipulation. The retention (i.e., 2) and production (i.e., 3) processes are largely individual characteristics that should be counterbalanced by our random group assignment. The possible interference of attentional (i.e., 1) or motivational processes (i.e., 4) that relate to the chosen operationalization, however, cannot be ruled out. The model statement accounts we used were about events that might not have been interesting or engaging enough to hold all participants' attention. Another concern is whether participants were motivated to perform well and to make use of their newly acquired skill. Child and adolescent participants were not aware of any reward prior to their participation, and adult participants' compensation was not bound to their performance outcome. Furthermore, a model statement, as opposed to a practice narrative, does not have the beneficial effect of establishing rapport by engaging in a conversation about an individualized topic. A good rapport between interviewer and interviewee might in turn positively affect the interviewee's motivation to perform well. With regard to memory processes, the most likely explanation for not finding a beneficial effect of the presentation of a model statement is that listening to a model statement may not lead to practicing retrieval. One of the reasons why practice narratives are effective is because they lead to practicing retrieval in the sense that participants *actively* produce their own account, making subsequent memory retrieval more efficient (e.g., Karpicke & Roediger, 2008; Roediger & Butler, 2011). However, listening to a model statement is a *passive* process in which

retrieval may not be practiced, hence our null effects. A direct comparison between practice narrative and model statement would be insightful to test this proposed cognitive mechanism.

Second, some age effects emerged independent of the model statement condition (Experiment 2). Adolescents provided longer free recall statements that included more correct and fewer missing details, compared with children. This result is consistent with other research that reported more detailed accounts in older children. In one such study, field interviews were analyzed in respect to question style of the interviewer and the information provided by the child (Lamb et al., 2000). That is, there was an age increase in the number of details in response to free recall invitations. As a third result we found, in response to the cued nonmisleading questions, that adolescents' reports were more accurate overall, with fewer incorrect but more missing details than those of children. A possible explanation for the larger number of missing details in the cued question section might be that adolescents did not see the need of repeating information that they had already given in the free recall section, even though they were informed that there would be some overlap. Children therefore benefitted more from receiving retrieval cues in the form of questions. This parallels previous studies concerning the effects of follow-up questions on the completeness of accounts (Lamb et al., 2003). Nevertheless, as mentioned at the outset, more focused questions may have memory distorting effects (Loftus, 2005). Fourth, in response to the misleading questions, children were almost twice as likely to confirm to the erroneous suggestions as adolescents. This is in line with previous work on the misinformation effect that highlights younger participants' vulnerability to confirm to misleading information, especially when it is given by an authority figure (Bruck & Ceci, 1999; Loftus, 2005). This finding again underpins the dangers of asking leading or suggestive questions during investigative interviewing.

Some limitations merit mentioning. Because of the previously discussed reasons, attentional and motivational processes as well as participant's understanding on how to make use of the model statement should be taken into account in future experiments. Furthermore, our procedure was, in substantial parts, analogous to studies using model statements to detect deceit (Bo-

gaard et al., 2014; Leal et al., 2015), but differed in terms of the studied sample and the targeted information. While the statements given in previous experiments had personal relevance and self-involvement, our participants had to report on an event they had witnessed without any personal engagement; which again might undermine attentional and motivational processes. Note also, that Experiments 1 and 2 should not directly be compared because of differences in the methods (e.g., video vs. staged event, length of target event, transparency of the true purpose of the experiment). In light of these limitations, future work should attempt to delineate under which circumstances a model statement might be a useful tool in investigative interviewing. There is abundant room for further progress in determining the possible moderating effect of the target group and its self-involvement in the to-be-recalled event, the recall mode (verbally by phone, see Leal et al., 2015, or in person, the present experiments, or in written form, Bogaard et al., 2014), the delay between event, model statement, and recall, or the content and length of the model statement. For children, developmental aspects such as language, memory, and attention skills might also be assessed to determine differences in the capacity to give a free recall account.

To sum up, the present experiments were the first that examined the effect of a model statement on eyewitness memory. Although model statements might be effective for discriminating between truth-tellers and liars, we show that they are not necessarily effective for aiding eyewitness memory. At face value, a model statement has the contours of a simple, straightforward strategy, but as of now we must conclude that different types of model statements and possible influencing moderator variables (e.g., participant motivation) should be tested before including model statements in interview protocols.

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