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The effects of drawing on preschoolers' statements about experienced and non-experienced events

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Summary
Although drawing is frequently used during investigative interviews, few studies have explored the effectiveness of draw-and-talk techniques with very young children. In this article, we examined the effects of drawing on preschoolers' (3–6 years old) reports of self-experienced and non-experienced events. In Study I, we interviewed 83 preschoolers about a staged event. We did not observe any significant statement differences between children asked to draw-and-talk compared to a verbal-only condition. In Study II, we interviewed 25 preschoolers about a nonexperienced event. Twenty-one children initially denied the event. When asked if they could help the interviewer draw a person from the event, 13 (61.9%) children complied with the request and eventually provided several false details. While drawing did not significantly increase the average number of details, exploratory findings indicated that drawing may have helped a subset of children. However, drawing might impair children's accuracy when suggestively interviewed about nonexperienced events.

KEYWORDS
child interview, children's testimony, drawing, police interview, preschooler

1 | INTRODUCTION

Practitioners sometimes use drawing to facilitate communication during investigative interviews with children (Mattison & Dando, 2020). During the last decades, numerous studies have examined the effects of drawing on children's witness statements in terms of their completeness and accuracy (for a recent overview, see Lamb, Brown, Hershkowitz, Orbach, & Esplin, 2018). The most studied technique is the "draw-and-talk" method (Butler, Gross, & Hayne, 1995), where children are asked to draw and describe the event they are interviewed about. Introduction of the draw-and-talk technique have led to improvements in terms of the quantity of reported details, without a decrease in accuracy, when compared to verbal questioning (e.g., Butler et al., 1995; Gross & Hayne, 1998, 1999; MacLeod,

Gross, & Hayne, 2013; Patterson & Hayne, 2011, Salmon, Roncolato, & Gleitzman, 2003; but for exceptions, see Salmon, Pipe, Malloy, & MacKay, 2012; Teoh & Chang, 2018). A meta-analysis covering six studies estimated the overall effect size to be large ($d = 0.95$, Driessnack, 2005). The present study focuses on examining the potential risks and benefits of using the draw-and-talk technique with very young children (ages 3–6).

From a theoretical perspective, the draw-and-talk technique could have several advantages in an interview setting. Following the encoding specificity principle, memory recall is improved by the presence of contextual cues during memory retrieval that overlaps with the encoding context (Tulving & Thomson, 1973). The act of drawing may encourage children to generate their own memory retrieval cues without relying on recognition-based question prompts from the

interviewer (see Butler et al., 1995). Draw-and-talk could, therefore, be particularly valuable for young children, who are more reliant on interviewer scaffolding due to their limited cognitive abilities and narrative skills (Saywitz & Camparo, 2014). A similar drawing-based mnemonic technique (sketch mental reinstatement of context) have also improved the accounts given by other vulnerable witness populations including children with autism spectrum disorder (Mattison, Dando, & Ormerod, 2015) and older adults (above 65 years; Dando, 2013). Furthermore, the draw-and-talk technique has been proposed to (a) help children structure their reports, (b) potentially reduce anxiety, (c) prolong the time children spend talking, (d) encourage children to verbalize details that might otherwise be overlooked, and (e) positively influence the questioning behavior of interviewers (Butler et al., 1995; MacLeod et al., 2013; Mattison & Dando, 2020). However, there are potential disadvantages of the draw-and-talk technique. In some circumstances, drawing has been found to reduce children's accuracy (Bruck, Melnyk, & Ceci, 2000; Macleod, Gross, & Hayne, 2016; Otgaar, van Ansem, Pauw, & Horselenberg, 2016; Strange, Garry, & Sutherland, 2003). For instance, two studies report that drawing can be associated with an increase in false details if children are repeatedly interviewed suggestively about non-experienced events (Bruck et al., 2000; Strange et al., 2003).

During police investigations, forensic interviewers should primarily use open-ended questions that encourage children to freely recall their experiences (Brubacher, Benson, Powell, Goodman-Delahunty, & Westera, 2020). Suggestive questions and other types of interviewer bias can impair the accuracy of both children and adults' accounts (Howe & Knott, 2015). Preschoolers are particularly vulnerable to these types of external suggestive influences and compliance effects (Ceci & Bruck, 1995). Across the last decades, substantial efforts have been made to develop and implement research-based child interviewing techniques focused on minimizing the risks of suggestive questioning (Brubacher et al., 2020). Nevertheless, field studies report that practitioners occasionally continue to pose suggestive questions to preschoolers even after receiving specialized child interviewing training (Lamb et al., 2018).

Although suggestive questions are highly problematic, the police sometimes need to ask specific questions for investigative purposes in cases where a child does not respond to open-ended prompts (Poole, 2016). Child interviewing guidelines in different countries often recommend using a funnel approach with progressively more specific questions in situations where a child does not approach the topic of concern (Brubacher et al., 2020, see also Melinder, Magnusson, & Gilstrap, 2020). In Scandinavian settings, forensic interviewers sometimes instruct preschoolers to draw and describe persons as a technique for approaching the topic of concern (Langballe & Davik, 2017). However, more research is needed to examine the effects of this procedure in situations where a child does not approach the topic of concern to verbal questioning. On a similar note, few studies have examined the draw-and-talk technique within the context of a research-based interviewing protocol that includes other "best practice" components such as an explanation of conversational ground rules (e.g., to not guess and that it is okay to say "I don't know") and narrative practice using open-ended questions (see Brubacher et al., 2020).

In textbooks about interviewing children (e.g., Poole, 2016, p. 147), it has been argued that drawing may not be suitable for children under the age of 5 years. Few studies have examined the validity of this claim, and the findings have been mixed. Butler et al. (1995, Experiment 2) compared the effects of drawing using a 2 (interview condition: draw-and-talk vs. questions only) x 2 (age: 3–4-year-old children vs. 5–6-year-old children) between-subjects design with a sample of 67 children in total. The researchers reported that while older preschoolers described more details in the draw-and-talk condition than in the questions-only condition, the draw-and-talk condition did not result in a significant improvement in recall for the younger preschoolers. Gross and Hayne (1998) found that drawing improved recall for emotional events among 40 preschoolers (aged 3–6 years) with no observable age differences. Finally, Bruck et al. (2000) examined potential risks associated with drawing with a sample of 87 preschoolers (3–6 years old). They reported that children made more false claims about nonexperienced events after two suggestive interviews where they were asked to draw than did children in a questions-only condition. Similar to Gross and Hayne (1998), Bruck and colleagues did not find any age differences. However, it should be noted that these studies, like the majority of early papers on the draw-and-talk technique (see Driessnack, 2005, for an overview), consisted of relatively small samples, which could increase the risk of inflated effect sizes as well as undermine the possibility of detecting true effects (e.g., see Button et al., 2013).

Since the three experiments discussed above were published, a substantial number of studies have been conducted on the effects of drawing with children aged 5 years and above (see Lamb et al., 2018). However, the question of whether drawing could be beneficial for younger preschoolers has been largely ignored. This is concerning, particularly as Butler et al. (1995, p. 606) stated in their original paper; "Although drawing appear particularly suited for 5- to 6-year-old children, its use with younger children should not be ruled out." The present paper, therefore, aimed to address this gap in the literature by examining the benefits and potential risks of the draw-and-talk technique with preschoolers aged 3–6 years. Specifically, we investigated the effects of drawing on young children's accounts, in terms of their completeness and accuracy, about experienced (Study I) and non-experienced (Study II) events.

2 | STUDY I

In the first experiment, we examined whether drawing could be used to improve preschoolers' accounts of an experienced event. In line with past research on the draw-and-talk technique, we predicted that drawing would increase the number of reported details when compared to a verbal control condition (H1). Moreover, based on the findings reported by Butler et al. (1995), we hypothesized that the predicted beneficial effect would be moderated by child age, such that drawing would have a larger effect as child age increased (H2). For exploratory purposes, we also examined differences in the children's accuracy between the draw-and-talk and verbal-only conditions.

2.1 | Method

2.1.1 | Participants

The data were collected through a convenience sample consisting of 88 preschoolers recruited from 18 preschools in Gothenburg, Sweden. In Sweden, young children have universal access to preschools, and approximately 95% of all children (ages 3–5 years) are estimated to attend (National Agency for Education, 2013). Five participants were excluded from the analyses because they did not complete the drawing phase ($n = 3$) or the interviewer deviated from the interview guide ($n = 2$). Thus, the analyses are based on data from the remaining 83 preschoolers (53 girls and 30 boys, M_{age} = 62 months, SD = 8.7 months, age range 42–75 months). A sensitivity power analysis using the G*Power software (v3.1.9.2; Faul, Erdfelder, Lang, & Buchner, 2007) indicated that this sample size generates 80% power to detect an effect size of $d = 0.63$ while maintaining $\alpha = .05$. All children had written parental consent to participate, and the children gave their verbal assent before their interviews. The study was carried out in accordance with the Helsinki Declaration, and was reviewed and approved by the Regional Ethical Committee Board in Gothenburg.

2.1.2 | Procedure

Approximately 1 week prior to the children's interviews ($M = 6.8$ days, $SD = 1.4$, $Mdn = 7$, range 2–9),[1] the children took part in a staged event at their preschools. Two research assistants dressed as pirates introduced themselves as two fictional characters ("Pia the Pirate" and "Malin the Sailor") and showed the children a suitcase filled with different objects. Pia the Pirate thereafter gave the children pirate hats and asked if they also wanted to dress up and take a photo while acting like pirates (to simulate cases of sexual posing, see Brown et al., 2013). One of the preschool teachers was asked to take photos of the children. Lastly, Pia the Pirate read a storybook about friendly pirates who searched for a treasure. Malin the Sailor was introduced as a friend to Pia the Pirate, and she helped dress the children in pirate hats and turn the pages in a logbook. The event lasted about 20 min.

The interviews were part of a larger activity for small groups of preschoolers (5–10 children per session) during an annual Science Fair. When arriving at the university to be interviewed, the children were greeted by a researcher dressed as a detective ("Clever Clara") and given age-appropriate information about the study (that Clever Clara's friends wanted to interview the children to learn more about how adults should talk to children). The children were individually interviewed by one of ten research assistants following a semi-structured interview guide adapted from the original NICHD protocol (see Lamb et al., 2018) and the Sequential Interview Model (see Langballe & Davik, 2017). All interviewers, who were naïve to the study aim and hypotheses, had prior experience of working with children and had received a two-day training course in child interviewing given by the first three authors. To simulate real cases, the interviewers were instructed to investigate what, if anything, had happened during the alleged pirate event. Importantly, the interviewers had no prior knowledge regarding the event before they began conducting the child interviews.

The interview guide contained six phases (see Figure 1); *introduction*, *explanation of ground rules* (including to not guess, saying I don't know, and correcting the interviewer if he or she made a mistake[2]), *rapport building* (the children were randomly assigned to a shorter verbal rapport or a longer prop-based rapport), *short break* (either before or after the initial questioning), *questions about Pia the Pirate*, and lastly *questions about Malin the Sailor*, during which phase the children were randomly assigned to draw-and-talk or verbal questioning. The first five phases of the interviews formed the basis for a separate study examining pre-substantive interviewing structures (the NICHD protocol vs. the Sequential Interview Model) and will therefore not be discussed in detail (for more information, see Magnusson et al., 2020). In brief, the NICHD protocol condition included a shorter
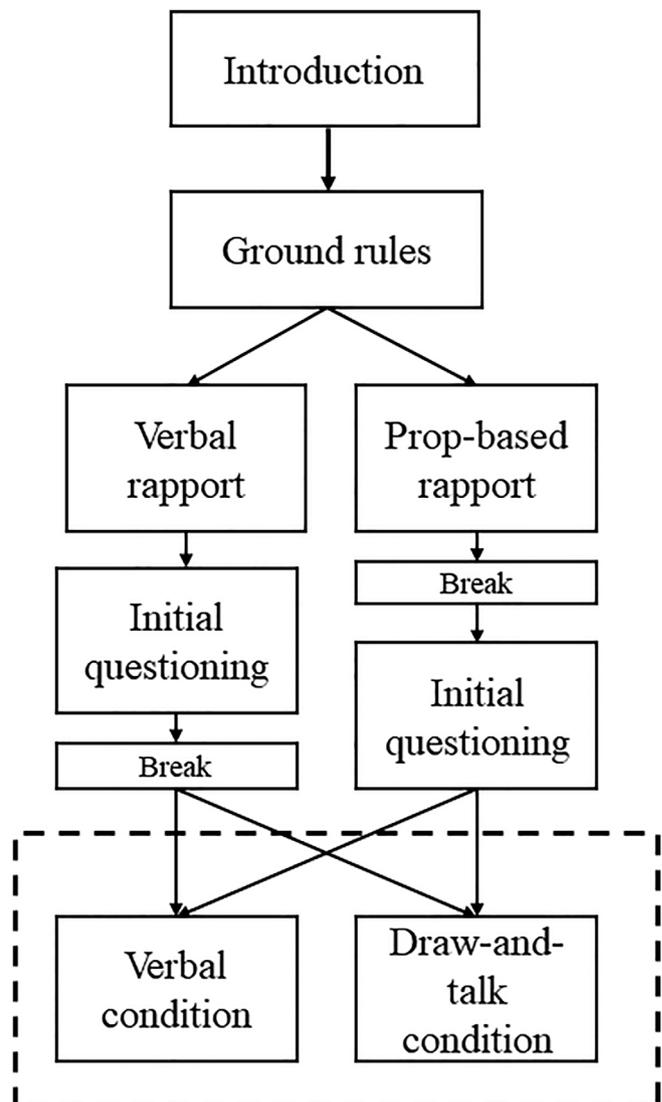

FIGURE 1 Visual flow chart of the interview structure with the drawing phase marked with a dashed line rectangle

verbal rapport building session comprising open-ended questions about the children's interests and an episodic narrative practice phase about a second staged event. Beyond these verbal rapport building activities, the Sequential Interview condition also included a corroborative jigsaw puzzle task and a five-minute break after the pre-substantive phase. Potential effects of the pre-substantive interview structure were statistically controlled for in the following analyses on the draw-and-talk technique.

The current study focused on the last phase of the interview, during which children were randomly allocated to either a draw-and-talk or verbal-only condition and asked to describe everything they remembered about "Malin the Sailor." Children in the draw-and-talk condition were given crayons and a white sheet of paper. The interviewer then said "Now I would like to ask some questions about Pia the Pirate's friend Malin the Sailor. I thought we could draw Malin the Sailor." After the child had started to draw, the interviewer said "Tell me about Malin the Sailor." The interviewers were instructed only to ask questions and not draw anything themselves to avoid unintentionally influencing the children's accounts. Children in the verbal condition were given the same free recall prompts without the drawing instructions ("Now I would like to ask some questions about Pia the Pirate's friend Malin the Sailor. Tell me about Malin the Sailor"). In both conditions, when the child started to talk about the event, the interviewer used invitations (e.g., "Tell me more"), cued-recall prompts (e.g., "You said she had a sword, tell me more about that"), and encouraging facilitating utterances (e.g., "okay," nodding their head, repeating the child's last words). In line with the recommendations of Barlow, Jolley, and Hallam (2011), the interviewers were also instructed to ask interactive open-ended questions (e.g., "What did Malin the Sailor's sword look like?") to expand upon information the children had spontaneously given.

After exhausting the children's free recall, all children were asked three scripted questions; "What hair colour did Malin the Sailor have?" (specific directive question), "Was Malin the Sailor wearing a striped or dotted shirt? (closed multiple-choice question with one accurate option), and "Clever Clara said that Malin the Sailor had a big yellow hat, is that correct?" (suggestive yes/no question with a false detail). The interviewers thereafter thanked the children for their participation and asked if they had any questions before ending the interview. Afterwards, the children took part in a debriefing session involving a pirate treasure hunt.

2.1.3 | Coding

The interviews were video-recorded and transcribed verbatim. A research assistant, who was naïve to the aim and hypotheses of the study, coded the verbal content of the children's reports. Repeated details were only scored the first time they occurred. All details about the pirate event including actors (e.g., *pirate*), actions (e.g., *showed*), objects (e.g., a *suitcase*), animals (e.g., a *shark*), setting (e.g., at *pre-school*), time (e.g., *before*), body parts (e.g., *eyes*), and clothing (e.g., a *necklace*) were given one point each. Additional attributes were also given one point each (e.g., "a small yellow toy" counted as three points). Details about the drawing materials were not counted (e.g., "This crayon is blue").

Each detail was thereafter coded as accurate, inaccurate, or non-classifiable (including subjective utterances). Since the to-be-remember event was carried out at preschools where children not part of the study were present (i.e., children where consent was not given for their participation), we were, for ethical reasons, unable to video-record the event. Instead, accuracy was established from the event script, photographs of the pirates' appearances and props, and detailed logbooks that the pirates kept for each visit. The accuracy rate was calculated as the number of accurate details divided by the sum of accurate and inaccurate details. For the scripted questions about Malin the Sailor's hair colour and shirt pattern, the children's responses were coded as accurate, inaccurate, or non-responsive (e.g., "I don't know"). For the suggestive question regarding whether Malin the Sailor had a large yellow hat, the children's responses were either coded as an accurate rejection of the suggested detail (i.e., "no," or "I don't know") or an inaccurate acceptance of the suggestion (i.e., "yes" or providing additional details about a yellow hat). When children changed their answer to the scripted questions (e.g., "She had red hair, or no, I think it was brown!"), we only coded their last response.

Inter-rater reliability analysis

A second research assistant coded 20% of the transcripts. Cohen's Kappa coefficients ranged from 0.79 (accuracy) to 0.84 (amount of detail), indicating an adequate level of inter-rater agreement. Disagreements were resolved through discussion, and the main coder thereafter coded the remaining transcripts.

2.2 | Results and discussion

Preliminary statistical analyses showed that there were no significant differences between the draw-and-talk and verbal conditions with regard to the distribution of child gender, age, retention interval length, assignment to the previous interviewing techniques (i.e., NICHD protocol vs. the Sequential Interview Model), all $ps > .05$. Furthermore, there were no significant differences between interviewers on any of the dependent variables ($ps > .05$).

2.2.1 | Total amount of details

First, we examined the effects of using drawing on the amount of reported details by comparing children in the draw-and-talk condition with children in the verbal condition. A visual inspection of the distributions of data indicated positively skewed data in both groups (see Figure 2). To address issues with non-normally distributed residuals and heteroscedasticity, the number of details reported by each participant was log-transformed (log10) before being submitted to a hierarchical multiple linear regression analysis.[34] Bias-corrected and
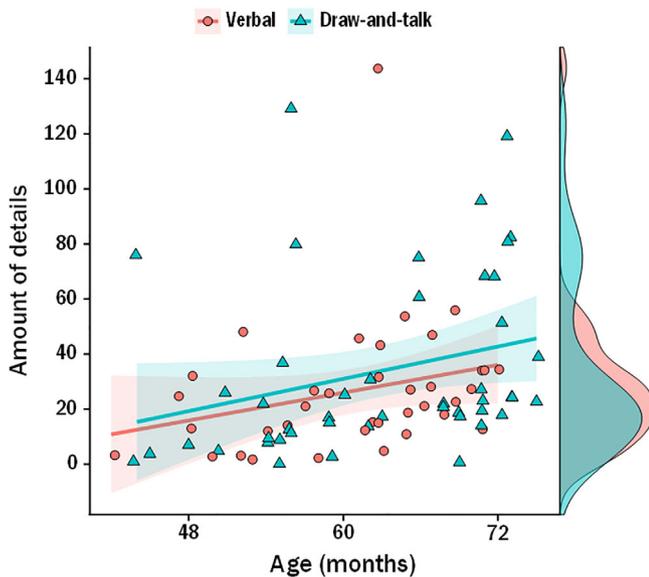
FIGURE 2 The distribution of the total amount of reported details in the verbal and draw-and-talk conditions in Study I. The colored lines and shaded areas represent the slopes and 95% confidence bands for age fitted using ordinary least squares regression within each of the conditions separately
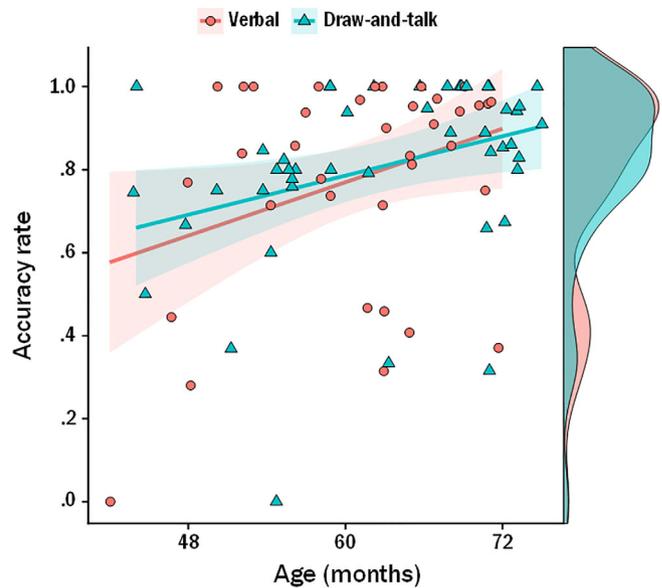

FIGURE 3 The distribution of accuracy rates in the verbal and draw-and-talk conditions in Study I. The colored lines and shaded areas represent the slope and 95% confidence bands for age fitted using ordinary least squares regression within each of the conditions separately

accelerated (BCa) bootstrapping using 10,000 samples was used to derive 95% confidence intervals around the regression coefficients. In Step 1, retention interval (days), age (months), pre-substantive interview structure (0 = NICHD protocol, 1 = Sequential Interview Model), and the drawing manipulation (0 = Verbal, 1 = Draw-and-talk) were entered as predictor variables. The model explained approximately 28% of the variance in the total amount of reported details, $R^2_{Adj.}$ = .277, $F(4, 77)$ = 8.76, $p < .001$. Retention interval (b = 0.04, BCa 95% CI [−0.09, 0.18], β = .059, p = .542) and the drawing manipulation (b = 0.02, BCa 95% CI [−0.34, 0.49], β = .009, p = .925) were not significantly associated with the number of reported details. Thus, there was no support for H1. However, there was a significant positive relationship between age and number of reported details (b = 0.05, BCa 95% CI [0.02, 0.07], β = .388, $p < .001$), indicating that older children tended to report more information. Furthermore, there was also a significant relationship between the pre-substantive interview structure and total amount of recalled details (b = −0.68, BCa 95% CI [−1.08, −0.31], β = −.339, $p < .001$), indicating that children in the longer prop-based rapport building condition reported fewer details (M_{raw} = 18.9, SD_{raw} = 18.1) compared to children in the verbal-only rapport building condition (M_{raw} = 40.9, SD_{raw} = 33.5).

In Step 2, an interaction term between age (mean centered) and the drawing manipulation was added to the regression model. The inclusion of the interaction term did not significantly improve the model, ΔR^2 = .011, $F(1, 76)$ = 1.27, p = .264, thus failing to provide support for H2. In Step 3, an interaction term between drawing condition and the pre-substantive interview structure was entered to explore whether effects of drawings was contingent on the interview structure manipulation. The interaction term did

not significantly improve the model, ΔR^2 = .004, $F(1, 75)$ = 0.49, p = .486.

It should be noted that, although our regression analysis failed to detect an effect of drawing on the *average* number of reported details, Figure 2 shows that high numbers of reported details were particularly common in the draw-and-talk condition. In fact, the proportion of participants who reported 60 or more details was significantly higher in the draw-and-talk condition (23.9%) than in the verbal condition (2.9%), $\chi^2(1)$ = 7.46, p = .006, ϕ = .300, 95% CI [0.090, 0.484]. While this is an exploratory finding and the 60-detail cutoff is arbitrary, it suggests that drawing may increase interview output, but only for a small subset of children.

2.2.2 | Accuracy rates

Preliminary analyses showed that the pre-substantive interview structure did not have a significant main or interaction effect on the participants' accuracy rates ($p > .315$). We have therefore chosen to omit interview structure from the following analyses. The accuracy of participants' reported details was generally high (M = .80, SD = .23) and participants' accuracy rates were negatively skewed with a high concentration in the upper range (see Figure 3). Because accuracy rates are bound between 0 and 1, participants' accuracy rates were logit-transformed before being submitted to inferential tests.[5] A Welch t-test showed that the accuracy rates did not differ significantly between participants in the draw-and-talk condition (M_{raw} = .81, SD = .22) and the verbal condition (M_{raw} = .78, SD = .26), $t(74.46)$ = 0.24, p = .812, Hedges' g = 0.05, 95% CI

[−0.39, 0.49]. To examine the informativeness of our null finding, tests of statistical equivalence were performed using the TOSTER package for R (Lakens, Scheel, & Isager, 2018). Equivalence testing indicated that the observed effect did not differ significantly from equivalence bounds representing a "small-to-medium" effect (−0.35 < d < 0.35), $t(74.53) = -1.33$, $p = .094$ (one-tailed). However, equivalence bounds set to represent a "medium" effect (−0.50 < d < 0.50) did result in a significant equivalence test, $t(74.53) = -2.01$, $p = .024$ (one-tailed). Thus, while small effects of the drawing manipulation on accuracy cannot be confidently ruled out, medium or larger effects are unlikely.

A hierarchical linear regression analysis was conducted on participants' logit-transformed accuracy rates. Step 1, in which retention interval, age, and the drawing manipulation were entered as predictor variables, explained approximately 8% of the variance in accuracy rates, $R^2_{Adj.} = .082$, $F(3, 79) = 3.46$, $p < .020$. Retention interval ($b = 0.22$, BCa 95% CI [−0.46, 0.05], $\beta = .148$, $p = .168$) and the drawing manipulation ($b = -0.05$, BCa 95% CI [−0.88, 0.79], $\beta = -.012$, $p = .914$) were not significantly associated with participants' accuracy rates. However, there was a significant positive relationship between age and accuracy rates ($b = 0.07$, BCa 95% CI [0.02, 0.13], $\beta = .300$, $p = .007$), indicating that the information reported by older children was more accurate. In Step 2, the interaction between age and the drawing manipulation did not significantly improve the model, $\Delta R^2 = .000$, $F(1, 78) = 0.00$, $p = .947$, indicating that the effect of drawing on accuracy rates did not differ significantly as a function of age.[6]

2.2.3 | Responses to scripted questions

Participants' responses to the scripted questions were examined using chi-square independence tests. In response to the open-ended directive question ("What colour was Malin the Sailor's hair?"), we found no significant difference between the draw-and-talk condition (56.8% accurate responses, 22.8% inaccurate responses, 20.5% did not respond) and the verbal condition (51.4% accurate responses, 24.3% inaccurate responses, 24.3% did not respond), $\chi^2(2, N = 81) = 0.27$, $p = .875$, $\phi = .058$, 95% CI [−0.163, 0.272]. Similarly, in response to the option-posing question comprising one accurate option (Did Malin the Sailor have a striped or dotted shirt?), we found no significant difference in the children's response styles between the draw-and-talk condition (62.2% accurate responses, 15.6% inaccurate responses, 22.2% chose none of the options) and the verbal condition (58.3% accurate responses, 16.7% inaccurate responses, 25% none of the options), $\chi^2(2, N = 81) = 0.13$, $p = .937$, $\phi = .040$, 95% CI [−0.180, 0.256]. Lastly, we found no significant difference in the children's acceptance or rejection of the suggestive claim about a nonexisting detail (a large yellow hat) between the draw-and-talk condition (64.4% accurate rejections) and the verbal condition (68.6% accurate rejections), $\chi^2(1, N = 80) = 0.15$, $p = .699$, $\phi = .043$, 95% CI [−0.168, 0.250].

2.2.4 | Discussion

Taken together, we did not find support for any of our hypotheses. Children in the draw-and-talk condition did not provide significantly more details compared to those in the verbal condition and the predicted beneficial effect was not moderated by child age. Age did, on the other hand, significantly predict both the quantity and accuracy of reported details. Although drawing was not associated with an average increase in details, our exploratory analyses indicated that drawing may have been beneficial for a small subset of children. In line with past research, the draw-and-talk instruction did not appear to have a negative effect on the children's accuracy when describing a self-experienced event.

3 | STUDY II

In real-life criminal investigations, practitioners who interview children rarely know the ground truth (i.e., what exactly the children have witnessed) and, sometimes, concerns regarding suspected abuse can be unfound. Thus, we wanted to investigate whether drawing would encourage false reporting among children who had *not* experienced the event they were questioned about (see also Bruck et al., 2000; Strange et al., 2003). Specifically, we aimed to explore the extent to which preschoolers would provide false details after an interviewer had suggestively asked them to draw something they had never witnessed. Due to the exploratory approach, no predictions were made a priori regarding the proportion of children who would provide false details after being encouraged to draw a non-experienced event.

3.1 | Method

3.1.1 | Participants

The sample consisted of 25 preschoolers (15 girls and 10 boys, $M_{age} = 65.2$ months, $SD = 8.0$, age range 47–75 months) from five preschools in Gothenburg, Sweden. All children gave verbal assent to be interviewed and had written parental consent to participate in the study.

3.1.2 | Procedure

The data were collected using a convenience sample for which preschool teachers and caregivers could sign up to take part in the study. Importantly, to avoid potential effects from social influence, none of the children's preschools participated in the pirate event from Study I. As such, none of the children who took part in Study II knew anything about Pirate Pia or Malin the Sailor before their interview.

Seven trained interviewers carried out the interviews. The same initial procedure (including meeting the Detective Clever Clara) and

interview guide were used as in Study I, except with regard to the questions about a non-experienced event (a pirate visit at the preschool). During the substantive phase, all children were first asked two initial questions about the non-experienced event and encouraged to elaborate ("I heard that you met Pia the Pirate, do you remember that?" and "Detective Clever Clara said that a pirate came and visited you at your preschool, tell me about that"). These initial prompts enabled us to exclude children who began providing false details before we had introduced the drawing material. If a child did not respond to the first two prompts, the interviewer proceeded to the drawing phase. The interviewer then said "I thought we could try to draw Pia the Pirate together, can you help me with that?" and gave the child a set of crayons and a sheet of paper. If the child started to draw, the interviewer said "Tell me everything that happened with the pirate, from the beginning to end" and followed the child's narrative with invitations (e.g., "Tell me more," What happened next?"), cued recall prompts (e.g., "You mentioned a sword, tell me more about that"), facilitating utterances ("Mhm," nodding, repeating the child's last word) and interactive open-ended questions ("What did she look like?"). After they had exhausted the children's narrative, the interviewers said "I have not met Pia the Pirate, tell me everything you remember about her" and used the same follow-up prompts as outlined above. The children were thereafter thanked for their participation and debriefed.

3.1.3 | Coding

The video-recorded interviews were transcribed, and the details were coded by a research assistant who was unaware of the study's aim. We used the same coding procedure for the amount of details as outlined in Study I. A second research assistant coded 20% of the data and the coders reached an adequate agreement level, Cohen's κ = .83. Disagreements were examined and resolved through discussion. Interview extracts to exemplify the children's responses have been edited to facilitate reading and translated to English by the first author.

3.2 | Results and discussion

Of the 25 children, four started to provide details about a pirate in response to the introductory questions before the drawing material was introduced. Their false narratives are beyond the scope of the present study and will therefore not be discussed further (see Magnusson, Joleby, et al., 2020). Of the remaining 21 children, 13 (61.9%) complied with the drawing request. Eight children (38.1%) stated that they could not help the interviewer to draw the pirate. Seven of these children also gave an explanation to why they could not draw her; stating that they had not met her and did not know what she looked like (n = 5), could not remember the event (n = 1), or were not good at drawing (n = 1).

The 13 children who complied with the drawing request provided between 2 and 59 false details about the pirate, with a mean of 17.0 details (SD = 16.8, Mdn = 10). Child age was not significantly correlated
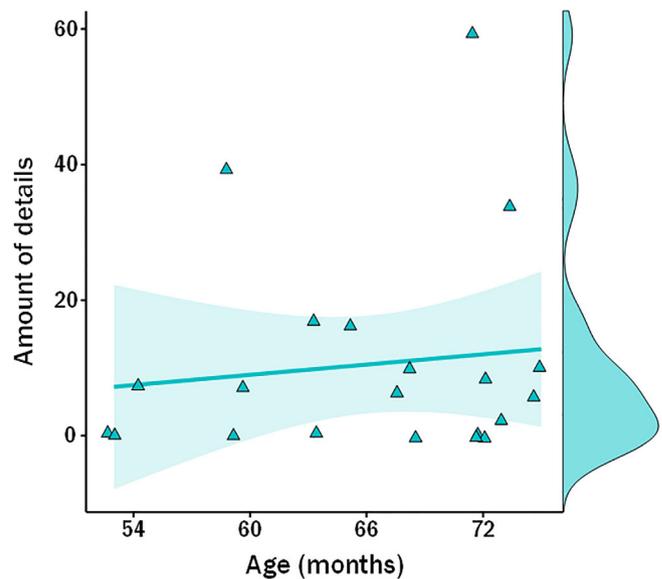

FIGURE 4 Distribution of false details provided in response to the drawing request in Study II. The line and shaded area represent the slope and 95% confidence band for age fitted using ordinary least squares regression

with the reported amount of false details, r(19) = 0.120, p = .605, 95% CI [−0.329, 0.524]. See Figure 4 for a visual representation of the data. With regard to the type of false details, the percentages (out of the combined total amount of details) were as follows: descriptions regarding additional attributes (25.8%), actors (17.6%), clothing (15.8%), body parts (14.9%), objects and animals (13.6%), actions (7.2%), settings (3.6%), and temporal details (1.5%). The false details frequently contained stereotypical details about pirates, including that she had an eyepatch, a pirate ship, a sword, and a black hat. See, for example, this extract from an interview with a 5-year-old (65 months) boy:

> *Interviewer: Tell me everything that happened with Pia the Pirate?*
> *Child: It had a sword.*
> *Interviewer: It had a sword. Tell me more?*
> *Child: It had a pirate ship.*
> *Interviewer: Aha. Tell me about the pirate ship?*
> *Child: It can go.*
> *Interview: It can go. Where does the pirate ship go?*
> *Child: On the ocean.*

Ten children explicitly said, while drawing, that they did not know what the pirate looked like or what had happened. In several cases, children responded with false details but, with follow-up questions, stated that they did not know any more. To exemplify, see the following conversation with a 4-year-old (59 months) boy:

> *Interview: Tell me what Pia the Pirate looked like?*
> *Child: I don't know, she had a purple shirt, blue pants and a black hat.*

Interview: *A black hat?*

Child: *And pink shoes.*

Interviewer: *What happened when you met Pia the Pirate?*

Child: *I don't know, I never met her.*

The act of drawing appeared related to the generation of false details, as children often narrated what they drew in the picture when responding to the interviewers' questions about the pirate. Here is an example with another 5-year-old (71 months) boy:

Interviewer: *Tell me everything that happened with Pia the Pirate?*

Child: *I don't know.*

Interviewer: *You don't know.*

Child: *They had ragged clothes.*

Interviewer: *Ragged clothes okay. What happened with Pia the Pirate?*

Child: *I don't know. Oh, I forgot her shoelaces [child is looking at the drawing].*

The majority of children did not report meeting the pirate themselves, but rather described her appearance and actions. However, one 6-year-old (75 months) girl explained that while she had not seen any pirates, she had heard them in the hallway to her preschool. Another 5-year-old (71 months) boy gave a longer false statement about meeting the pirate after being asked to draw.[7] Here is an example from his interview:

Interviewer: *What happened with Pia the Pirate?*

Child: *We looked at a tiny, tiny ship.*

Interviewer: *You looked at a ship.*

Child: *Mm, I can't draw ships.*

Interviewer: *No. Tell me more about that?*

Child: *We got to enter the ship.*

Interviewer: *Aha you got to enter the ship. Tell me more about the ship?*

Child: *We got to drive it a little.*

Interviewer: *You got to drive it. What did the ship look like?*

Child: *It looked a bit like a pirate ship. I think I know how to draw a pirate ship but it is going to be difficult.*

Interviewer: *Mm. What did the pirate ship look like?*

Child: *It is small and has a flag.*

Interviewer: *What did Pia the Pirate look like?*

Child: *I don't remember anything more than her face. This is the ship [the child points to the drawing].*

3.3 | Discussion

Most children (61.9%) complied with the drawing request even though they initially denied meeting a pirate at their preschool. The children who drew also provided a number of false details about the appearance and actions of the character, which seemed largely based on stereotypical representations of pirates. Worryingly, having been instructed to draw-and-talk, one child gave a longer false narrative (59 false details) about participating in the non-experienced event.

4 | GENERAL DISCUSSION

In two studies, we examined the potential benefits and risks of using the draw-and-talk technique with very young children. Following the encoding specificity principle (Tulving & Thomson, 1973) and past research on draw-and-talk (Butler et al., 1995), we predicted that drawing would facilitate memory retrieval for self-experienced events. Our results from Study I showed that the use of drawing did not elicit more details (on average) compared to a verbal control condition from preschoolers interviewed about a staged event. Furthermore, although child age was a significant predictor of statement quantity and accuracy, it did not moderate the expected effect of the draw-and-talk instruction. While we did not find support for our hypotheses, drawing did, on the other hand, not compromise the children's response accuracy about a self-experienced event. Our second study, however, showed that among children interviewed about a non-experienced event, more than half of the sample began to draw and provide false details in response to suggestive interviewing including a drawing request. Each of these findings will be discussed in more detail below.

The null-findings with regard to the amount of details observed in our first study is not consistent with the early literature on the benefits associated with using the draw-and talk technique (e.g., Butler et al., 1995). In recent years, however, several experiments have reported either null-findings (Salmon et al., 2012; Teoh & Chang, 2018) or negative results indicating certain risks with drawing (Macleod et al., 2016; Otgaar et al., 2016). Potentially, the large effect sizes (overall $d = .95$, with individual study estimates ranging between 0.59 and 1.90) reported in the meta-analysis by Driessnack (2005) might be inflated due to small samples (between 32 and 55 participants per experiment, with an average of 40 children in total) resulting in imprecise effect size estimates. The findings from Study I lend some support for this idea, as we were unable to detect any similarly sized effects of the draw-and-talk instruction despite our substantially larger sample ($N = 83$). On the other hand, it is important to keep in mind that our sample included both younger and older preschoolers. Since few studies have examined the effects of draw-and-talk with very young children (exceptions being Bruck et al., 2000; Butler et al., 1995, Experiment 2; Gross & Hayne, 1998), the empirical evidence regarding potential draw-and-talk benefits with 3 to 4-year-old children is still mixed. Future research could focus on untangling from what developmental phase drawing may be appropriate and how the effectiveness of the technique relates to other cognitive factors rather than focusing solely on chronological age.

Even though draw-and-talk did not increase the average number of reported details in Study I, it is important to note that there was

substantial variability between children in the draw-and-talk condition. This could, in part, reflect individual differences in their witnessing capabilities. Similar observations of large standard deviations and unequal variance between conditions can be found in several previous draw-and-talk studies (e.g., Butler et al., 1995; Otgaar et al., 2016; Wesson & Salmon, 2001). Interestingly, our exploratory analyses indicated that larger numbers of reported details (>60 details) were particularly common among children in the draw-and-talk condition. Thus, we cannot rule out that the drawing instruction may have helped a subset of children. There are further reasons to assume that the potential benefits of draw-and-talk may vary from child to child depending on individual or contextual factors. For example, some children in the present experiment said during their interviews that they did not like to draw, which could be an obstacle for the potential effectiveness of the technique. Asking children about their own experiences of the draw-and-talk technique may provide interesting insights regarding the usability of drawing (see Katz, Barnetz, & Hershkowitz, 2014). Moreover, if researchers were to recruit larger samples, it would enable more sophisticated statistical analysis methods (e.g., quantile regression) to probe whether the draw-and-talk instruction has a beneficial influence only for particular participant subgroups.

In previous draw-and-talk studies, little attention has been given to the potential risks involved when interviewing children who have not experienced the event in question (for exceptions, see Bruck et al., 2000; Strange et al., 2003). Based on our findings from Study II, more than half of the children provided false details after being asked to draw a non-experienced event, and one child gave a detailed false account of meeting a character he had never met. These results extend past studies by Bruck et al. (2000) and Strange et al. (2003) by demonstrating that even one single interview containing a relatively minor form of suggestive questioning (i.e., two misleading questions about meeting a fictional pirate) could produce false details among a subset of children. Taken together, findings such as these may pose a threat to the practical implementation of the technique, as practitioners often interview children in situations where it is not known whether a child has been victimized (Korkman, Antfolk, Fagerlund, & Santtila, 2018). Specifically, our results demonstrate that some children complied with a suggestive drawing request even after initially denying having information about the event. Importantly, however, since Study II was small-scale and exploratory, these findings need to be replicated within larger samples with random assignment to a draw-and-talk or verbal condition to establish the effects of using drawings coupled with suggestive introductory questions. Nonetheless, the current results demonstrate that there could be negative consequences of using draw-and-talk while not adhering to "best practice" recommendations for conducting child interviews.

It is important to note that the children's false details seemed to be based largely on stereotypical representations of pirates, including statements about a pirate sailing a ship, having a sword, and wearing a black hat. Different forms of stereotypical representations regarding suspects can also be present in legal cases through, for example,

repeated negative stereotype induction (see Ceci & Bruck, 1995). Speculatively, drawing may also invite children to engage their imagination, which could imply a potential risk in terms of a decrease in accuracy (Strange et al., 2003). As drawing non-experienced events could encourage confabulation and visual imagery, the practice might lead to richer false statements further down the line if children are interviewed on multiple occasions with drawing acting as a form of memory rehearsal (see Bruck et al., 2000; Strange et al., 2003). Specific instructions relating to the draw-and-tell technique may potentially reduce these risks, such as telling children to only draw events that really happened (see also MacLeod et al., 2016). Future research could also explore the possibility of introducing a draw-and-talk training session (similar to episodic narrative practice training, see Lamb et al., 2018) prior to the substantive phase of an interview. Following the concerns raised earlier regarding the pirate event, future investigations may benefit from using encoding paradigms that do not involve fantasy characters.

Some methodological concerns of the present studies need to be addressed. First, the external validity is limited, considering that the children were asked about an unusual event involving interacting with pirates. Furthermore, we asked children to draw a person, which differs from previous studies in which children have typically been asked to draw "what happened." Although the choice of this procedure was led by practical reasons (to focus the children's recall on the second actor in Study I), the practice of asking children to draw specific persons is currently implemented in, for example, the Norwegian child interviewing guidelines as a method for approaching the topic of concern with preschool-aged children (Langballe & Davik, 2017). Specialized forensic interviewers from other countries have also reported that they occasionally ask children to draw persons during investigative interviews (e.g., in Sweden, see Magnusson, Ernberg, Landström, & Akehurst, 2020, and the UK, see Mattison & Dando, 2020). The current results should therefore be of relevance from a practical perspective. A handful of the children in the draw-and-talk condition (Study I) did not engage fully with the drawing material throughout the questioning phase, which could have limited the potential benefits of drawing for these participants.

While the pre-substantive phase (i.e., participating in a shorter or longer rapport building condition) was only included as a control variable in the present analyses, we did observe a significant effect on the children's total amount of details in Study I. Specifically, children assigned to the shorter verbal rapport building condition (based on the NICHD protocol) provided more details compared to children assigned to a longer prop-assisted rapport building condition (based on the Sequential Interview model). This finding is likely to derive from fatigue effects, which is a common problem during interviews with preschool-aged children (for more information, see Magnusson et al., 2020). Moreover, the children's word comprehension was not established beforehand (e.g., if the children understood the difference between a striped and dotted shirt). The youngest participants might have struggled with the terminology used in the scripted questions. Similarly, the suggestive questions involved the use of "tags" (e.g., "Clever Clara said that Malin the Sailor had a big

yellow hat, *is that correct?*"), which preschool-aged children can have particular difficulties responding to (Saywitz & Camparo, 2014). Lastly, our statistical power was limited, and we can therefore not rule out the presence of small to medium sized effects. Likewise, the null findings regarding the Age × Drawing interactions in Study I should be interpreted cautiously due to the small sample size.

5 | CONCLUSIONS

The current study contributes to the growing literature on the effects of using drawing during forensic interviews with young children. The present design extends past literature by including very young children (3–6 years of age) in the sample. In our first study, draw-and-talk instructions did not lead to a general increase in details when preschoolers were interviewed about an experienced event. Furthermore, based on our findings from the second study, drawing could be problematic in cases where young children are interviewed about nonexperienced events. Considering practitioners' use of drawing in field settings, researchers need to continue to untangle the potential risks and benefits associated with drawing during forensic child interviews. Until these issues have been resolved, there is reason for caution when using the draw-and-talk technique with young preschoolers.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ENDNOTES

[1] Due to the varied retention interval length, we statistically controlled for this variable in the analyses.

[2] The ground rules phase followed the instructions given in the original NICHD protocol (see Lamb et al., 2018) and included practice in applying the "I don't know" and "Correct me when I am wrong" rules.

[3] Because the log transformation cannot be computed for zeros, a constant of 1 was added to each participant's score before the transformation.

[4] In recent years, concerns have been raised regarding the practice of using transformations when the raw data does not meet the assumptions underlying the statistical tests (e.g., Lo & Andrews, 2015). To ensure that our findings were robust across different analytical procedures, we conducted a series of generalized linear model (GLM) regressions analyses with both the raw (untransformed) and transformed data using the gaussian distribution of residuals and identity link function. We also conducted GLM regression with a negative binomial distribution and logit link. The results of these parallel tests did not change the conclusions drawn from the primary analyses using transformed data. A detailed overview of results from the GLM regression analyses can be found in the Supporting Information.

[5] Because logit transformation of zeros and ones return $-\infty$ and $+\infty$, respectively, a constant of .01 was added to values of 0 and subtracted from values of 1 before the transformation.

[6] A parallel analysis using the untransformed data is presented in the Supporting Information. The use of transformed or untransformed data did not change the nature of the results.

[7] To exclude potential source monitoring errors, the parents of the child confirmed that he had not participated in any other events involving meeting a pirate and driving a pirate ship. The participating preschools had also confirmed prior to the data collection that they had not taken part in any similar pirate event.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.