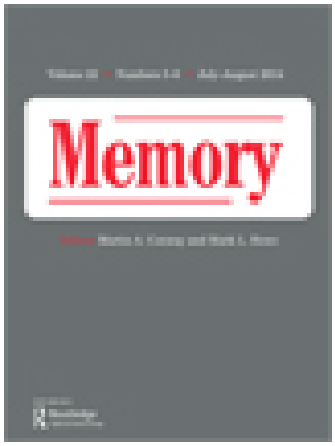


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# Drawing conclusions: The effect of instructions on children's confabulation and fantasy errors

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# Drawing conclusions: The effect of instructions on children's confabulation and fantasy errors

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Drawing is commonly used in forensic and clinical interviews with children. In these interviews, children are often allowed to draw without specific instructions about the purpose of the drawing materials. Here, we examined whether this practice influenced the accuracy of children's reports. Seventy-four 5- and 6-year-old children were interviewed one to two days after they took part in an interactive event. Some children were given drawing materials to use during the interview. Of these children, some were instructed to draw about the event, and some were given no additional instructions at all. Children who were instructed to draw about the event, or who were interviewed without drawing, made few errors. In contrast, children who drew without being given specific instructions reported more errors that were associated with both confabulation and fantasy. We conclude that, to maximise accuracy during interviews involving drawing, children should be directed to draw specifically about the interview topic.

***Keywords:*** Drawing; Children; Errors; Interview.

During the 1980s and 1990s, courtrooms were flooded with cases involving accusations of child sexual abuse by teachers and caregivers. A number of high-profile cases attracted considerable media attention, including cases involving staff at the Wee Care Nursery School, the Country Walk Babysitting Service and the McMartin Preschool (see Ceci & Bruck, 1993; Myers, 2009; Schreiber et al., 2006). In these lengthy and expensive trials, young children provided testimony that eventually led to the prosecution and imprisonment of the accused. At the time of these trials, very little was known about appropriate methods for interviewing young children in forensic contexts, and interviewers had little knowledge about the effect of different interview techniques on children's reports.

The monetary and human costs of these trials was substantial, but they ultimately generated questions which gave rise to a body of empirical research on interviewing children in forensic settings (e.g., Ceci & Bruck, 1993; Garven, Wood, Malpass, & Shaw, 1998; Lamb, Orbach, Hershkowitz, Esplin, & Horowitz, 2007; Schreiber et al., 2006). The lasting legacy of these trials is that we now have a mature evidence base to guide interviews with children in forensic settings. Despite substantial progress during the past 20–30 years, however, researchers continue to evaluate interviewing practices in an attempt to maximise the chances that professionals obtain complete and accurate accounts from children.

One thing that is now clear is that although open-ended questions yield the most accurate

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information from children (see Ceci & Bruck, 1993; Lamb et al., 2007; Poole & Lamb, 1998; Powell & Snow, 2007), the amount of information that young children provide in response to these open-ended questions is often too lean to be of substantive forensic value (Hershkowitz, Lamb, Orbach, Katz, & Horowitz, 2012; Hutcheson, Baxter, Telfer, & Warden, 1995; Orbach et al., 2000). Given this, interviewers often resort to using interview aids to augment young children's accounts. For example, in the high-profile court cases described above, interviewers used dolls, drawings and other props to facilitate children's reports. Based on research findings, the use of dolls and other props is now widely discouraged in forensic interviews, because such props are associated with reductions in children's accuracy (Bruck, Ceci, & Francoeur, 2000; Pipe & Salmon, 2009; Salmon, 2006; Salmon, Bidrose, & Pipe, 1995). The use of drawing, however, remains commonplace; interviewers often use drawing to encourage children's reports about events such as trauma or abuse (Cohen-Liebman, 2003; Driessnack, 2005; Joint Child, Youth and Family & New Zealand Police Policy and Operating Guidelines, 2007; Katz & Hershkowitz, 2010; Lev-Wiesel & Liraz, 2007). The important question is whether an interview aid like drawing detracts from the accuracy of children's accounts.

Although many of the common interview aids such as props or body maps have been shown to reduce children's accuracy (Bruck, Ceci, et al., 2000; Pipe & Salmon, 2009; Salmon et al., 1995; Willcock, Morgan, & Hayne, 2006), research on drawing has shown that allowing children to draw during an interview not only helps them to report more information (Butler, Gross, & Hayne, 1995; Gross & Hayne, 1998, 1999; Katz & Hershkowitz, 2010; Macleod, Gross, & Hayne, 2013; Wesson & Salmon, 2001; Woolford, Patterson, Macleod, Hobbs, & Hayne, 2013), but it does so without decreasing accuracy (Butler et al., 1995; Gross & Hayne, 1999; Gross, Hayne, & Drury, 2009). In a typical experiment employing drawing, children are asked to draw and tell, or to simply tell about a target event. During both kinds of interviews, the interviewer only asks general open-ended questions. Under these conditions, the consistent finding is that drawing augments children's verbal reports about unique and emotionally relevant experiences and that it is effective with children as young as 3- or 4-years-old. These effects have been replicated across multiple laboratories, with moderate to large effects ($d$ = 0.59–1.06; Butler et al., 1995; Driessnack, 2005; Gross & Hayne, 1998, 1999; Patterson & Hayne, 2011; Wesson & Salmon, 2001). Most importantly, when accuracy has been assessed, drawing has increased the amount of information reported without decreasing accuracy (Butler et al., 1995; Gross & Hayne, 1998, 1999). Drawing, however, is not a silver bullet. When drawing is combined with inappropriate questions (i.e., leading or misleading questions), it does not inoculate children against the negative effects of these questions, and the accuracy of children's accounts is compromised (Bruck, Melnyk, & Ceci, 2000; Gross, Hayne, & Poole, 2006; Strange, Garry, & Sutherland, 2003).

In all of the research on drawing to date, children have been given explicit instructions about what to draw at the outset of the interview: they are specifically told to draw about the event in question. In contrast, currently in clinical and forensic settings, drawing is sometimes used without specific instructions, as an unstructured, informal activity to keep a child interested in the interview process (e.g., Bekhit, Thomas, & Jolley, 2005; Grice, 2007; Malchiodi, 1998). In this context, children are not asked to draw specifically about the event under discussion but are allowed to draw whatever they like. For example, a child may draw a picture of things that he likes to do (e.g., playing at his friend's house), while he is being interviewed about a suspected experience of being abused. The key question is how might undirected drawing affect children's accuracy in a forensic interview?

Prior research on children's drawing sheds at least some light on the answer to this question. For example, we know that children draw for different reasons in different contexts. In many contexts, particularly under adult instruction, children draw to represent real objects (Freeman & Janikoun, 1972; Luquet, 1927). For example, in a survey study, Rose, Jolley, and Burkitt (2006) found that in the classroom, teachers commonly directed children to copy objects, as a means of developing fine-motor skills and the skills to portray realism (see also Anning, 2002).

On the other hand, children also draw as a self-directed, play-based activity (Hopperstad, 2008; Piaget & Inhelder, 1969; Wright, 2007). For example, Hopperstad (2008) found that when 5- and 6-year-old children drew for play, they often portrayed fantasy scenes and ideas about

their world, similar to the way in which they use pretence to explore new ideas and experiences through socio-dramatic play (see also Ivashkevich, 2009). Under these free-drawing conditions, children imparted meaning to their pictures in an interactive and dynamic way, changing the stories, narrative and content as their drawing evolved. At present, there is very little research investigating the content and structure of drawings that children produce during spontaneous play, but it is likely that the content of the play-based drawings would vary widely, given that the activity is dynamic and involves fantasy.

With this research background in mind, we hypothesise that children's accuracy in prior research on drawing during interviews has been maintained because, when directed to draw about a real target event, children focused on recalling, drawing and discussing real content about the event. On the other hand, when children are allowed to engage in undirected drawing, without explicit instruction about the relation between the drawing and the event per se, we hypothesise that they might mistake the interview as play activity leading them to fantasise and embellish their story about the event rather than sticking to things that they explicitly recall. Alternatively, or in addition, children might incorporate aspects of their drawing that are unrelated to the topic of the interview into their verbal report about an actual event and interviewers might misinterpret children's descriptions of their drawings as relevant to the topic at hand. Any or all of these conditions would lead to a decrease in the accuracy of the child's account. In short, given what we know about the relation between children's drawings and play, providing no explicit instruction about the purpose of the drawing activity might tip the balance away from veridical recall to fantasy and storytelling.

The aim of the present experiment was to examine children's accuracy for a specific event under the conditions of limited instruction that characterise some clinical and forensic interviews. To do this, children participated in a unique event and were interviewed one to two days later. Some children were given drawing materials to use during the interview. Of these, some were instructed to draw about the event, and some were given no explicit instructions about what to draw. The key question was whether these instructions influenced the accuracy of children's verbal accounts.

# METHOD

## Participants

Seventy-nine 5- and 6-year-old children (35 male and 44 female; $M_{age}$ = 5.9, $SE$ = 0.05) were recruited from three local schools in a small university city. The children were predominantly of European descent and came from middle-income socioeconomic backgrounds. All children had parental consent to participate. The first five children (3 males, 2 females) were interviewed as part of interviewer training and were not included in the final analysis (final $n$ = 74).

## Event

The children were taken in groups of 17–23 on a trip around the local harbour in a Sub-Antarctic research vessel. During the trip, they toured the boat, touched and held sea creatures (e.g., crabs, sea urchins) and learned about the typical activities that occurred on the boat (e.g., plankton trawling). At the end of the trip, children were given a cardboard medal and were thanked for their participation.

## Interview

The interview procedure was based on that originally developed by Butler et al. (1995). Children were interviewed individually at their school within 48 hours of the trip by trained interviewers who had no prior knowledge about the boat trip or the experimental hypotheses. The interviewer established rapport by chatting with the child about a neutral topic (e.g., school activities). The interviewer then showed the child a medal that was identical to the one that he or she had received at the conclusion of the boat trip and asked the child to talk about the event that was associated with the medal. This procedure is identical to the procedure that has been used in prior research on drawing (e.g., Butler et al., 1995; Gross & Hayne, 1999; Gross et al., 2009). The use of the medal as a cue provides a way to signal to the child what the interviewer wants to talk about while still requiring the child to recall the event from memory.

Children were randomly assigned to one of the three interview conditions. Twenty-five children (8 male, 17 female) were asked to *tell* the

experimenter everything that they could remember about the boat trip (*tell* condition). Twenty-eight children (14 male, 14 female) were given a sheet of white, A3 construction paper, and 12 Jovi coloured crayons, and were asked to *draw* the experimenter everything that they could remember about the boat trip (*directed draw* condition). Finally, 21 children (10 male, 11 female) were given the same paper and crayons and told: "you are allowed to use [these] to draw whatever you want while I'm talking to you". While children were drawing, they were asked to *tell* the experimenter everything that they could remember about the boat trip (*undirected draw* condition).

For children in each condition, the interviewer said (appropriate to the condition):

> I heard that yesterday (*or* on [name of day]) you did something special and were given a medal just like this one. I wasn't there. *Tell* (or *Draw* for the Directed Draw condition only) me everything that you can remember about what happened. *Tell* (or *Draw*) me everything that you can remember about the time you got this medal.

Prior research has shown that children spontaneously narrate while they draw (that is, they draw and tell; Butler et al., 1995; Gross & Hayne, 1998). Only one child declined to draw but still provided a narrative (unstructured draw condition). This child's data were retained in the analysis, as it represented a possible response to the request to draw in a real interview and was also the most conservative analytic approach.[1]

Following the initial condition-specific instructions, the interview was conducted in two phases across all interview conditions: (1) free recall and (2) specific recall.

*Free recall.* After the initial open-ended prompt, the experimenter maintained the flow of the interview by using minimal responses (e.g., "cool", "uh-huh"), reinforcement and repeating parts of the child's utterance. The interviewer prompted children for further information by using open-ended questions that were based on the initial prompt (e.g., "Is there anything else that you can tell [*or* draw] me about the time you got this medal?") or based on children's utterances (e.g., "Can you tell [draw] me more about when you *had fun*" or "*went round the harbour*?").

*Specific recall.* Once a child indicated that he or she could recall no more in response to the general, open-ended prompt, the interviewer asked four specific, open-ended questions about (1) where the children went, (2) how they got there, (3) who was there and (4) what they did (e.g., "Tell [*or* Draw] me where you went").

Before the specific prompting, children were informed that even if they had already told the interviewer the answer to the question, they should answer it again. The interviewers prompted children for additional information by using questions related to the specific prompt, or the children's own utterances. When children indicated that they could recall no more in response to a specific prompt, the interviewer moved on to the next specific prompt. At the conclusion of the interview, children were thanked for participating and were given a small gift.

## Coding

The interviews were audio recorded and transcribed verbatim. The information reported by children was coded into clauses. As described by Gross and Hayne (1999), a clause was roughly equivalent to a simple sentence and contained a verb and at least one noun. A confederate who took part in the event coded the information that children reported as "accurate", "inaccurate", "off-topic" or "led". Accurate information was any information that the confederate could verify was correct about the event or that was highly likely to have been accurate about the event but was impossible to verify as definitely correct (e.g., "my friend's favourite was the slimy one").

Inaccurate information was anything that was related to the event but that could be verified as definitely incorrect. Inaccurate information was further coded into two subcategories: Fantastical and Confabulation. Fantastical information included errors that were implausible, impossible or fantasy-based (e.g., "we saw a mermaid", "[we] had a race on the jet boats"). Confabulation information included errors that were plausible, but not correct (e.g., "a crab climbed on my head"), and errors about timing, order, amounts

[1] When this child's data were excluded from the analysis, the outcome was exactly the same.

(e.g., "it was after lunch", "there were 2 beds"), colours (e.g., "the boat was blue and yellow…"), names (e.g., "Mary" instead of "Emily"), objects (e.g., "canoe" instead of "boat") and exaggerations or minimisations. Finally, if children reported information in response to leading questions, this information was coded as Led.

In addition to the children's responses, the interviewer's questions were coded using a coding scheme based on the one developed by Gross and Hayne (1999). Open-ended Prompts were coded when the interviewer used a directive question, probe or instruction that prompted the participant in relation to the event (e.g., "tell me everything that you can remember about the time you got the medal", "what else can you draw?"). Specific Prompts were coded if the interviewer used an open-ended prompt to ask a child for further information about something that the child had reported (e.g., "tell me more about the bunk rooms"), or used one of the designated specific open-ended prompts (although Specific Prompts were open-ended in nature, for ease of exposition, we have referred to them as Specific Prompts). Leading Questions were coded if the interviewer asked a closed question that contained information that the child had not reported, or implied a Yes/No or specific answer (e.g., "was it fun?").

We counted the number of Open-ended, Specific and Leading Prompts that occurred across each child's interview. We also identified the kinds of prompts that interviewers used that elicited a child's error. That is, for every error that children made (or consecutive string of errors), we coded the most recent interviewer prompt that occurred prior to the child's error(s). Finally, we identified the kinds of prompts that interviewers used to follow up a child's error. For every error that children made (or consecutive string of errors), we identified the first interviewer prompt (Open-ended, Specific, Leading) that followed the error (s). Specific prompts could be used to request further information about the error (e.g., "Can you tell me more about that octopus?") or about a previously accurate statement (e.g., information that the child reported after an error, or information about the drawing). As such, when interviewers used a Specific Prompt, we noted whether the prompt was related to the child's error (Specific: Error), or whether it was related to other information (Specific: Other). Interview-irrelevant verbal behaviour (any off-topic information) was removed prior to the analysis.

To determine reliability, two experimenters independently coded 25% of the transcripts. The inter-rater reliability for parsing information into individual clauses was .99 (Pearson correlation); inter-rater reliability for coding information into the categories for both children and interviewers was .80 (Cohen's kappa).

# RESULTS

## Preliminary analyses

Preliminary analyses showed that there was no difference in the amount of information that children reported or in the number of errors they made as a function of the timing of their interview (within the 48-hour interview window). Furthermore, there was no difference in the total amount of information that children reported as a function of interview condition (tell $M = 86.96$, $SE = 9.78$; directed draw $M = 71.04$, $SE = 9.25$; undirected draw $M = 94.52$, $SE = 10.68$), $F(2, 71) = 1.50$, $p = .23$, $\eta_p^2 = .04$, $p = .31$.

## Children's errors

Children's errors were initially analysed in terms of the absolute number of errors they reported and in terms of the proportion of errors they reported relative to the total amount of information recalled. Separate one-way analyses of variances (ANOVAs) of these two dependent variables showed that there was a significant difference in the absolute number of errors ($F(2, 71) = 6.36$, $p < .01$, $\eta_p^2 = .15$, $p < .01$) and in the proportion of errors ($F(2, 71) = 9.41$, $p < .01$, $\eta_p^2 = .21$, $p < .01$) that children reported as a function of interview condition.

Tukey's honest significant difference (HSD) post-hoc tests of these main effects indicated that children in the *directed draw* and *tell* conditions reported a similar number of errors (*tell* $M = 11.24$, $SE = 3.84$; *directed draw* $M = 4.18$, $SE = 3.63$, $p = .56$), and a similar proportion of errors; for these groups, errors accounted for less than 10% of their narratives (*tell* $M = 0.10$, $SE = 0.02$; *directed draw* $M = 0.06$, $SE = 0.02$, $p = .20$). For children in the *undirected draw* condition, on the other hand, the error rate was significantly higher; this group reported more total errors than children in the *directed draw* group ($M = 23.91$, $SE = 4.20$, $p < .01$) and a higher proportion of errors

than children in the other two conditions ($p < .05$); for children in the *undirected draw* condition, errors accounted for 17% of the information that they reported. Given that there was no difference in the overall amount of information that children reported in each of the interview conditions, absolute errors, rather than proportion of errors, were used to examine the relation between children's errors and the interviewers' questions (see below).

## Interviewer questions

The next step in our analysis was to examine the kinds of questions that interviewers asked as a function of interview condition. These data are shown in Table 1. The data were analysed using separate one-way ANOVAs for the total number of prompts and then for each prompt type; Tukey's HSD tests were used for the post-hoc analyses.

Overall, interviewers used significantly more prompts in the *undirected draw* condition ($M = 68.19$, $SE = 4.53$) compared to the *directed draw* condition ($M = 54.64$, $SE = 3.93$). The number of total prompts used in the *tell* condition was intermediate between these two extremes ($M = 47.32$, $SE = 4.15$), $F(2, 71) = 5.86$, $p < .01$, $\eta_p^2 = .14$.

In terms of the individual prompt types, irrespective of interview condition, the interviewers rarely used leading prompts, on average, less than one leading prompt ($M = 0.65$, $SE = 0.13$) per child. Across interview conditions, there was no difference in interviewers' use of leading prompts, $F(2, 71) = 1.32$, $p = .27$, $\eta_p^2 = .04$, power = .27. Although the interviewers' use of leading prompts increased with subsequent interviews, $r = .32$, $p < .01$ (i.e., greater experience with the children's narrative), even in the last quartile of interviews, the average number of leading prompts remained less than one per interview ($M = 0.95$, $SE = 0.28$).

There was also no significant effect of interview condition on interviewers' use of Specific Prompts, but there was an effect of interview condition on interviewers' use of Open-ended Prompts, $F(2, 71) = 8.76$, $p < .01$, $\eta^2 = .20$. That is, interviewers used more open-ended prompts interviewing children in the *undirected draw* condition than they did interviewing children in the *tell* condition or in the *directed draw* condition.

## The relation between interviewers' questions and children's errors

Unlike real-world forensic settings, in which the connection between interviewer questions and accuracy cannot be scrutinised, in the present experiment, we had the opportunity to investigate the relation between the types of questions that interviewers asked and the nature of children's errors. We examined this relation in a number of different ways.

First, given that interviewers used more total prompts with children in the *undirected draw* condition relative to children in the *directed draw* condition, we analysed the number of specific types of errors that children reported using the interviewers' total prompts as a covariate in the analysis. The number of fantastical and confabulation errors that children reported were analysed using separate one-way analyses of covariances (ANCOVAs), controlling for the total number of interviewer prompts. For all ANCOVAs, significant effects were analysed using Tukey's HSD tests, and the direction of any significant effects is described.

When controlling for the total number of interviewer prompts, children in the *undirected draw* condition reported significantly more confabulation errors ($M = 11.00$, $SE = 1.89$) than did children in the *directed draw* condition ($M = 3.21$, $SE = 1.65$). The number of confabulation errors that

**TABLE 1**
The amount and type of interviewer questions that the interviewers used in each of the interview conditions

| *Question type* | *Tell* M (SE) | *Directed draw* M (SE) | *Undirected draw* M (SE) | *F* |
|---|---|---|---|---|
| Open-ended prompts | 21.16 (2.40) | 27.00 (2.27) | 36.00 (2.62) | $F(2, 71) = 8.76$, $p < .01$, $\eta^2 = .20$ |
| Specific prompts | 27.96 (3.12) | 28.00 (2.94) | 34.33 (3.40) | $F(2, 71) = 1.25$, $p = .29$, $\eta^2 = .03$, power = .26 |
| Leading questions | 0.88 (0.22) | 0.39 (0.21) | 0.71 (0.24) | $F(2, 71) = 1.32$, $p = .27$, $\eta^2 = .04$, power = 0.27 |

were reported by children in the *tell* condition was intermediate between these two extremes ($M = 7.20$, $SE = 1.74$), $F(2, 70) = 3.95$, $p < .05$, $\eta_p^2 = .10$ (see Figure 1).[2]

Similarly, when controlling for the number of interviewer prompts, children in the *undirected draw* condition reported more fantastical errors ($M = 12.95$, $SE = 2.44$) than did children in either the *directed draw* ($M = 0.68$, $SE = 2.11$) or *tell* ($M = 3.56$, $SE = 2.23$) conditions, who each reported similarly low levels of fantastical information, $F(2, 70) = 4.85$, $p < .05$, $\eta_p^2 = .12$ (see Figure 1).

In addition to controlling for the total number of prompts that interviewers used, we also had the opportunity to look more closely at the nature of the interviewers' questions directly before and after children made errors. Given what we know about the relation between leading questions and children's errors, we wondered what proportion of the errors that children made were in response to leading questions. Overall, the proportion of errors that were elicited by leading questions was extremely low (i.e., less than 2%) and did not vary as a function of interview condition (see above). Thus, the high number of errors in the *undirected draw* condition could not be attributed to an increased number of leading questions by the interviewer.

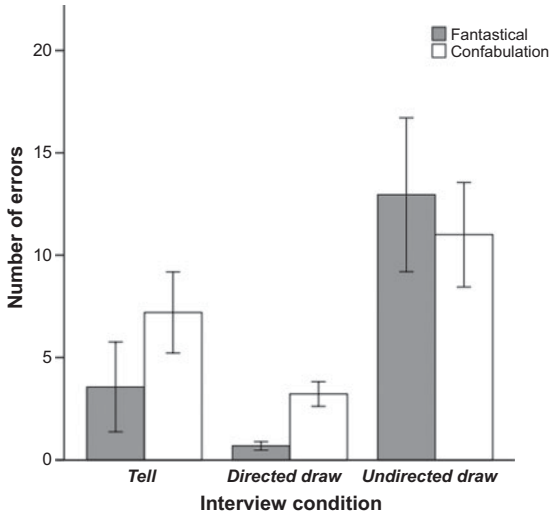


**Figure 1.** The mean number of confabulation and fantastical errors (±1 *SE*) that children reported in each of the interview conditions.

[2]For some analyses, one child's data was missing, so the total sample size was reduced to 73.

As described earlier, interviewers used more open-ended prompts with children in the *undirected draw* condition than they did with children in the other two conditions. Although open-ended prompts are considered to be the gold-standard question type, it was possible that, counterintuitively, interviewers' use of these kinds of prompts were the *cause* of the children's errors. In reviewing the transcripts, however, we noticed that in the *undirected draw* condition, interviewers often appeared to be using additional prompts to redirect children away from talking about inaccurate information rather than in an attempt to seek additional details about the errors (i.e., Open-ended prompts such as "What else do you remember about the time you got the medal/went on the boat?" and "Anything else you can remember?"). To test this possibility directly, we analysed the nature of the interviewers' prompts that directly followed children's errors.

When children made errors, interviewers never used a leading question as a follow-up; instead, they used only open-ended or specific prompts. To further investigate interviewers' responses to errors, we compared the number of different kinds of prompts they used (Open-ended, Specific Prompt: Error [a prompt for further information about the child's error], Specific Prompt: Other [a prompt for further information that was not associated with the child's error, including accurate information, or information about the child's drawing]) as a function of interview condition. To do this, we conducted an Interview Condition by Prompt Type ANOVA with repeated measures over prompt type (Greenhouse-Geisser correction). This analysis yielded significant main effects of prompt type, $F(1.75, 123) = 46.27$, $p < .01$, $\eta^2 = .40$, and interviewer condition, $F(2, 70) = 10.12$, $p < .01$, $\eta^2 = .22$, which were qualified by a significant Interview Condition by Prompt Type interaction, $F(3.5, 123) = 9.28$, $p < .01$, $\eta^2 = .21$. We used Tukey's HSD tests and a series of one-way ANOVAs to investigate the interaction effect. As shown in Table 2, when children made errors, interviewers used more Open-ended Prompts than Specific Prompts: Error, or Specific Prompts: Other. The biggest effect of open-ended prompts occurred for children in the *undirected draw* condition. Consistent with our qualitative review of the transcripts, interviewers

**TABLE 2**
The amount and type of prompts that the interviewers used that directly followed children's errors in each of the interview conditions

| *Follow-up prompt type* | *Tell* M (SE) | *Directed draw* M (SE) | *Undirected draw* M (SE) | *F* |
|---|---|---|---|---|
| Open-ended prompts | 2.76 (0.72) | 1.85 (0.69) | 7.29 (0.78) | $F$ (2, 70) = 87.90, $p < .01$, $\eta^2 = .56$ |
| Specific prompts: error | 1.84 (0.58) | 0.41 (0.55) | 1.86 (0.63) | $F$ (2, 70) = 2.14, $p = .12$, $\eta^2 = .06$, power = .42 |
| Specific prompts: other | 0.32 (0.27) | 0.26 (0.27) | 1.76 (0.3) | $F$ (2, 70) = 3.86, $p < .05$, $\eta^2 = .09$ |



interviewing children in the *undirected draw* condition appeared to be using additional open-ended prompts in an attempt to get children back on track. In other words, the additional prompts were a product of children's errors, rather than their cause.

Additional analyses indicated that overall, when interviewers used specific follow-up prompts (i.e., asked a child for further information about something that he or she had reported), they appeared to be unbiased with respect to children's accuracy; there was no difference in the proportion of occasions that interviewers used specific prompts for children's accurate reports ($M = 0.08, SE = 0.02$) compared to children's inaccurate reports ($M = 0.08$, $SE = 0.03$), $t$ (73) = −.07, $p = .95$. Overall, interviewers only used specific prompts in response to 7% of children's utterances ($M = 0.07$, $SE = 0.01$).

Although it was rare for interviewers to use specific prompts to follow-up a child's incorrect utterance, when interviewers did so, children's accuracy suffered. There was a significant correlation between interviewer prompts regarding inaccurate information (follow-up prompts), and new errors reported by children in relation to the prompts ($r = .85$, $p < .01$).

## DISCUSSION

Consistent with prior research, when children in the present experiment were interviewed about a unique event, those who were directed to draw specifically about the event, or who were asked to simply tell, made few errors. In contrast, children who drew without specific instructions about what to draw reported more errors associated with both confabulation and fantasy. In fact, the biggest effect of undirected drawing was on the number of fantastical errors that children made. Compared to children in the other two conditions, children who drew without direction reported significantly more extraordinary, impossible or fantasy-based errors, including errors about events such as travelling overseas, seeing an invisible octopus or riding on dolphins.

Past research has shown that for drawing to be a useful interview aid, the interviewer needs to use best-practice, open-ended interviewing techniques to maintain children's accuracy. The interviewers in the present research consistently used recommended techniques across all three interviewing conditions, but in spite of their best practice, the introduction of undirected drawing led children to stray far from the truth. We conclude that to maintain accuracy, children need to be asked open-ended questions, and if drawing is used as an interview aid, they also need to be instructed to draw specifically about the event that they are being asked to describe.

Research has shown that one factor that has been consistently associated with children's reports of inaccurate information is the interviewer's use of leading or suggestive questions (Bruck, Ceci, & Hembrooke, 2002; Pipe & Salmon, 2009). In the present research, the interviewers used very few leading or suggestive questions. The only interviewer question type that differed across interview conditions was the use of open-ended prompts—the exact questions that have been associated with high levels of accuracy in the past (Lamb et al., 2007; Poole & Lamb, 1998). In the present experiment, interviewers used more open-ended prompts with children in the undirected draw condition than they did with children in the two other conditions. That is, best practice questions still yielded errors when they were combined with the undirected drawing technique.

Although the number of interviewer prompts was related to the number of errors that children

reported, we conclude that the interviewer prompts did not cause the children to make more errors. We found that when children made errors, the interviewers appeared to suspect as much, and used additional prompts to help the child return to talking about the event of interest. In the following example, a child in the undirected draw condition is talking about seeing a hippopotamus. The interviewer repeatedly tries to get the child back on track:

I: So what are you drawing there?
C: Um hippopotamus.
I: Hey?
C: A hippopotamus.
I: Oh, hippopotamus. Cool. So what else can you tell me about the trip?
….
C: Um, a hippopotamus coming up the water.
I: A hippopotamus coming up to the water?
C: Coming out.
I: Oh ok. So can you tell me anything else about the time that you got the medal?

Children in the undirected draw condition drew and told about many other equally impossible and unlikely events, including love hearts floating in the sky, drinking wine and seeing blood. Rather than prompting children for further information about these errors (and generating even more errors), the interviewers used additional prompts in an attempt to get the children to move on. In other words, interviewers interviewing children in the undirected draw condition used additional prompts *in response* to children's errors rather than to produce them. Given this, we conclude that the increased error rate in this condition can be attributed to the nature of the drawing activity per se, and not to the way in which interviewers prompted children during the interview.

In the present research, two groups of children were given the opportunity to draw. Consistent with past research on drawing, children in the directed draw condition made very few errors. Children in the undirected draw condition, on the other hand, made many. What can account for this difference? Consistent with developmental research on children's drawings (Freeman & Janikoun, 1972; Hopperstad, 2008; Luquet, 1927; Piaget & Inhelder, 1969; Wright, 2007), we propose that children in the two groups perceived the purpose of the interview very differently. When children in the directed draw condition were asked to draw about the target event, they focused on real content in their drawings—they drew the boat, people and activities that they experienced during the event. Children did not stray from the topic at hand and rarely drew (or reported) fantasy-based concepts. In contrast, when children engaged in undirected drawing, and were allowed to choose what to draw, their focus during the interview strayed from realism to play and they sometimes chose to draw about imaginary, fantasy-based items or events. Furthermore, they incorporated this false information into their reports about the real event merging fantasy with reality. Perhaps not surprisingly, this more playful approach to drawing appears incompatible with the task of talking about a real event.

From a practical perspective, the increase in fantasy-related errors that we found for children in the undirected drawing condition is alarming because these kinds of errors are consistent with the sensational, extraordinary claims that children sometimes make during sexual abuse investigations. For example, in the McMartin Preschool case, when children were interviewed as witnesses, they reported that they had flown in planes with their teachers, dug up dead bodies, were forced to drink blood and witnessed the torture of animals (Myers, 2009). These kinds of events are not too dissimilar to the kinds of extraordinary, inaccurate activities that children in the undirected drawing group reported in the present research. The increase in more subtle, confabulation errors that was associated with undirected drawing is also alarming. These kinds of errors are even more difficult to identify as false because they may seem plausible or believable, so can serve to add weight to fantastical claims. In addition, although our interviewers rarely followed up on these kinds of errors, when they did, children's accuracy suffered further. In actual forensic interviews, fact-finders are much more likely to ask additional questions about bizarre or fantastical events potentially compounding the number of errors that children report.

In the present research, we selected to work with 5- and 6-year-olds because this is an age range with whom drawing is commonly used in an attempt to augment limited verbal communication skills. The next step is to investigate whether older children are better able to negotiate the separate task demands of reporting accurate information about a real event and concurrently drawing about something fictional. Our prediction is that drawing is likely to be most valuable when interviewers ask children to focus on the

single goal of both drawing and talking about the topic of interest. In this way, there is no confusion about the child's requirement to provide an account of a real experience, and the interviewer can be most confident that the information that the child is reporting is accurate.

In addition to age-related changes in the effects of undirected drawing, the present research raises other questions for future research. For example, in our research, we did not determine whether children who drew fantastical events truly believed that the false events had occurred, or whether the children knew that they were fantasising, and had misunderstood the expectation to only discuss real events. This is an issue that warrants further research. In addition, we do not know whether children would go on to develop false memories in relation to the false events that they described in the undirected drawing condition. Based on our prior research, we would predict that these false stories would become false memories over time (Gross et al., 2006). Again, this possibility remains to be tested.

In conclusion, when children hold valuable information about a forensic event, all measures should be taken to interview them in a manner that maximises accuracy. Our research adds to the body of evidence elucidating ideal interview conditions for obtaining accurate information from young children. We have shown that the framing of an interview aid such as drawing can have dramatic negative effects on children's accuracy. To maximise accuracy when using drawing, interviewers need to clearly instruct children to use the drawing in relation to the event of interest.



## REFERENCES


Anning, A. (2002). Conversations around young children's drawing: The impact of the beliefs of significant others at home and school. *International Journal of Art & Design Education*, *21*, 197–208. doi:10.1111/1468-5949.00317

Bekhit, N. S., Thomas, G. V., & Jolley, R. P. (2005). The use of drawing for psychological assessment in Britain: Survey findings. *Psychology and Psychotherapy: Theory, Research and Practice*, *78*, 205–217. doi:10.1348/147608305x26044

Bruck, M., Ceci, S. J., & Francoeur, E. (2000). Children's use of anatomically detailed dolls to report genital touching in a medical examination: Developmental and gender comparisons. *Journal of Experimental Psychology: Applied*, *6*, 74–83.

Bruck, M., Ceci, S. J., & Hembrooke, H. (2002). The nature of children's true and false narratives. *Developmental Review*, *22*, 520–554. doi:10.1016/s0273-2297(02)00006-0

Bruck, M., Melnyk, L., & Ceci, S. J. (2000). Draw it again Sam: The effect of drawing on children's suggestibility and source monitoring ability. *Journal of Experimental Child Psychology*, *77*, 169–196. doi:10.1006/jecp.1999.2560

Butler, S., Gross, J., & Hayne, H. (1995). The effect of drawing on memory performance in young children. *Developmental Psychology*, *31*, 597–608. doi:10.1037/0012-1649.31.4.597

Ceci, S. J., & Bruck, M. (1993). Suggestibility of the child witness: A historical review and synthesis. *Psychological Bulletin*, *113*, 403–439. doi:10.1037/0033-2909.113.3.403

Cohen-Liebman, M. S. (2003). Drawings in forensic investigations of child sexual abuse. In C. A. Malchiodi (Ed.), *Handbook of art therapy* (pp. 167–180). New York, NY: Guilford Press.

Driessnack, M. (2005). Children's drawings as facilitators of communication: A meta-analysis. *Journal of Pediatric Nursing*, *20*, 415–423. doi:10.1016/j.pedn.2005.03.011

Freeman, N. H., & Janikoun, R. (1972). Intellectual realism in children's drawings of a familiar object with distinctive features. *Child Development*, *43*, 1116–1121. doi:10.2307/1127668

Garven, S., Wood, J. M., Malpass, R. S., & Shaw, J. S. (1998). More than suggestion: The effect of interviewing techniques from the McMartin preschool case. *Journal of Applied Psychology*, *83*, 347–359. doi:10.1037/0021-9010.83.3.347

Grice, A. (2007, August 31). Darfur: The evidence of war crimes. *The Independent*. Retrieved from http://www.independent.co.uk

Gross, J., & Hayne, H. (1998). Drawing facilitates children's verbal reports of emotionally laden events. *Journal of Experimental Psychology: Applied*, *4*, 163–179. doi:10.1037/1076-898X.4.2.163

Gross, J., & Hayne, H. (1999). Drawing facilitates children's verbal reports after long delays. *Journal of Experimental Psychology: Applied*, *5*, 265–283. doi:10.1037/1076-898X.5.3.265

Gross, J., Hayne, H., & Drury, T. (2009). Drawing facilitates children's reports of factual and narrative information: Implications for educational contexts. *Applied Cognitive Psychology*, *23*, 953–971. doi:10.1002/acp.1518

Gross, J., Hayne, H., & Poole, A. (2006). The use of drawing in interviews with children: A potential pitfall. In J. R. Marrow (Ed.), *Focus on child psychology research* (pp. 119–144). New York, NY: Nova.

Hershkowitz, I., Lamb, M. E., Orbach, Y., Katz, C., & Horowitz, D. (2012). The development of communicative and narrative skills among preschoolers: Lessons from forensic interviews about child abuse. *Child Development*, *83*, 611–622. doi:10.1111/j.1467-8624.2011.01704.x

Hopperstad, M. H. (2008). How children make meaning through drawing and play. *Visual Communication*, *7*, 77–96. doi:10.1177/1470357207084866

Hutcheson, G., Baxter, J., Telfer, K., & Warden, D. (1995). Child witness statement quality. *Law and Human Behavior*, *19*, 631–648. doi:10.1007/BF01499378

Ivashkevich, O. (2009). Children's drawing as a sociocultural practice: Remaking gender and popular culture. *Studies in Art Education*, *51*, 50–63.

Joint Child, Youth and Family & New Zealand Police Policy and Operating Guidelines. (2007). *Forensic interviewing with at-risk children and young people on videotape under the Evidence Act 1908 and the Evidence (videotaping of child complainants) Regulations 1990*. Wellington: Ministry of Social Development and New Zealand Police.

Katz, C., & Hershkowitz, I. (2010). The effects of drawing on children's accounts of sexual abuse. *Child Maltreatment*, *15*, 171–179. doi:10.1177/1077559509351742

Lamb, M. E., Orbach, Y., Hershkowitz, I., Esplin, P. W., & Horowitz, D. (2007). A structured forensic interview protocol improves the quality and informativeness of investigative interviews with children: A review of research using the NICHD investigative interview protocol. *Child Abuse & Neglect*, *31*, 1201–1231. doi:10.1016/j.chiabu.2007.03.021

Lev-Wiesel, R., & Liraz, R. (2007). Drawings vs. narratives: Drawing as a tool to encourage verbalization in children whose fathers are drug abusers. *Clinical Child Psychology and Psychiatry*, *12*, 65–75. doi:10.1177/1359104507071056

Luquet, G. H. (1927). *Les dessin enfantin* [Children's drawings]. Paris: Alcan.

Macleod, E., Gross, J., & Hayne, H. (2013). The clinical and forensic value of information that children report while drawing. *Applied Cognitive Psychology*, *27*, 564–573. doi:10.1002/acp.2936

Malchiodi, C. (1998). *Understanding children's drawings*. New York, NY: Guilford Press.

Myers, J. E. (2009). Improved forensic interviewing: The legacy of the McMartin preschool case. In K. Kuehnle & M. Connell (Eds.), *The evaluation of child sexual abuse allegations* (pp. xix–xxv). Hoboken, NJ: Wiley.

Orbach, Y., Hershkowitz, I., Lamb, M. E., Sternberg, K. J., Esplin, P. W., & Horowitz, D. (2000). Assessing the value of structured protocols for forensic interviews of alleged child abuse victims. *Child Abuse & Neglect*, *24*, 733–752. doi:10.1016/s0145-2134(00)00137-x

Patterson, T., & Hayne, H. (2011). Does drawing facilitate older children's reports of emotionally laden events? *Applied Cognitive Psychology*, *25*, 119–126. doi:10.1002/acp.1650

Piaget, J., & Inhelder, B. (1969). *The psychology of the child*. London: Routledge & Kegan Paul.

Pipe, M. E., & Salmon, K. (2009). Dolls, drawing, body diagrams, and other props: Role of props in investigative interviews. In K. Kuehnle & M. Connell (Eds.), *The evaluation of child sexual abuse allegations* (pp. 365–398). Hoboken, NJ: Wiley.

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

Powell, M. B., & Snow, P. C. (2007). Guide to questioning children during the free-narrative phase of an investigative interview. *Australian Psychologist*, *42*, 57–65. doi:10.1080/00050060600976032

Rose, S. E., Jolley, R. P., & Burkitt, E. (2006). A review of children's, teachers' and parents' influences on children's drawing experience. *International Journal of Art & Design Education*, *25*, 341–349.

Salmon, K. (2006). Toys in clinical interviews with children: Review and implications for practice. *Clinical Psychologist*, *10*(2), 54–59. doi:10.1080/13284200600681601

Salmon, K., Bidrose, S., & Pipe, M. E. (1995). Providing props to facilitate children's event reports: A comparison of toys and real items. *Journal of Experimental Child Psychology*, *60*, 174–194. doi:10.1006/jecp.1995.1037

Schreiber, N., Bellah, L. D., Martinez, Y., McLaurin, K. A., Strok, R., Garven, S., & Wood, J. M. (2006). Suggestive interviewing in the McMartin Preschool and Kelly Michaels daycare abuse cases: A case study. *Social Influence*, *1*, 16–47. doi:10.1080/15534510500361739

Strange, D., Garry, M., & Sutherland, R. (2003). Drawing out children's false memories. *Applied Cognitive Psychology*, *17*, 607–619. doi:10.1002/acp.911

Wesson, M., & Salmon, K. (2001). Drawing and showing: Helping children to report emotionally laden events. *Applied Cognitive Psychology*, *15*, 301–320. doi:10.1002/acp.706

Willcock, E., Morgan, K., & Hayne, H. (2006). Body maps do not facilitate children's reports of touch. *Applied Cognitive Psychology*, *20*, 607–615. doi:10.1002/acp.1212

Woolford, J., Patterson, T., Macleod, E., Hobbs, L., & Hayne, H. (2013). Drawing helps children to talk about their presenting problems during a mental health assessment. *Clinical Child Psychology and Psychiatry*. Advance online publication. doi:10.1177/1359104513496261

Wright, S. (2007). Graphic-narrative play: Young children's authoring through drawing and telling. *International Journal of Education & the Arts*, *8*, 1–28.