

Does Drawing Facilitate Older Children's Reports of Emotionally Laden Events?

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Summary: Although it is well-established that drawing about an event increases the amount of verbal information that young children provide during an interview, it is unclear whether drawing continues to facilitate children's reports as they get older. In the present experiment, 90 children, ranging from 5- to 12-years old, were asked to draw and tell or to just tell about emotional events they had experienced. Children of all ages reported more information when asked to draw and tell rather than to tell only. Drawing had no negative effect on the accuracy of children's accounts. Drawing also increased the number of open-ended questions and minimal responses that interviewers used. We conclude that drawing may be a useful tool in clinical and forensic settings with children of all ages; it increases the amount of information that children report and the number of appropriate questions that interviewers ask. Copyright © 2009 John Wiley & Sons, Ltd.

In clinical and forensic settings, it is often necessary to obtain detailed and accurate accounts from children about their prior experiences. The information they provide is useful for legal purposes, as well as for clinical assessment, treatment and intervention. Children's ability to talk about past events has been examined extensively over the last two decades. We now know that even very young children can recall and recount details of a prior event (e.g. Boland, Haden, & Ornstein, 2003; McGuigan & Salmon, 2004; Peterson, Sales, Rees, & Fivush, 2007; Principe, Ornstein, Baker-Ward, & Gordon, 2000; Reese & Brown, 2000; Reese & Newcombe, 2007; Rudek & Haden, 2005; Salmon, McGuigan, & Pereira, 2006; Simcock & Hayne, 2003), but that their abilities are constrained in a number of ways. For example, young children have limited retrieval strategies and limited verbal skills. The reports provided by young children are substantially leaner than those reported by their older counterparts and, in some situations, their reports are so lean that they are of little or no clinical or forensic value (for review, see Hayne & Tustin, in press).

Given these limitations, researchers are currently exploring ways of enhancing children's ability to recall and describe their prior experiences. In developing a new technique, it is important that an increase in the amount of information that children report does not occur at the expense of accuracy. Drawing is one technique that might increase the amount of information that young children report. Historically, the claim that drawing facilitates children's reports of past events was made primarily in the context of clinical practice. Clinicians have long argued that drawing facilitates children's ability to talk about events such as being ill or distressed (Rae, 1991, Sourkes, 1991), but it is only within the last decade that researchers have examined the question empirically by directly measuring the effect of drawing on the content of children's reports and comparing that content to the content of children's reports who were only asked to tell about the same events (e.g.,

Gross & Hayne, 1998, 1999; Salmon, Roncolato, & Gleitman, 2003, for review, see Driessnack, 2005).

In the seminal demonstration of the phenomenon, Butler, Gross, and Hayne (1995) examined the effect of drawing on children's reports of a past event. Three- to 5-year olds participated in a unique event at a fire station and were interviewed about that event either 1 day or 1 month later. Half of the children were asked to draw and tell about the event and the other half were asked to tell about the event. Irrespective of whether they were interviewed 1 day or 1 month after the event, children in the draw and tell group reported almost twice as much information as did children in the tell group. Importantly, children in the draw and tell group were as accurate at describing the event as were children in the tell group.

Having established that drawing facilitated children's verbal reports over short delays, Gross and Hayne (1999) examined whether drawing continued to facilitate children's reports over longer delays. In their study, 5- to 6-year olds visited a local chocolate factory and were interviewed about the event either 1 day or 6 months later, and then all children were re-interviewed 1 year after the event. At each delay, half of the children were asked to draw and tell about the visit to the chocolate factory, and half of the children were asked to tell. Irrespective of delay, children who drew and told about the event reported more than twice as much information as did children who only told. Again, children in the draw group were as accurate as children in the tell group.

Gross and Hayne (1998) also examined whether drawing would help children to report information about their emotional experiences, an issue that is both clinically and forensically relevant. Three- to 6-year olds were asked to draw and tell or to tell only about a time when they felt happy, sad, angry or scared. Again, children who drew and told about the emotional events reported twice as much information as did children who only told about the emotional events. Parents reported that children's reports of their past emotional experiences were just as accurate when they drew and told about the event as when they told.

More recently, researchers in other laboratories have replicated and extended the same basic findings. For

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example, Wesson and Salmon (2001) compared the effect of drawing and re-enactment on 3- to 8-year-olds' reports of emotionally laden experiences. In their study, children were randomly assigned to a verbal, drawing or re-enactment condition. In the verbal condition, children were asked to tell about a time that they felt happy, sad or scared. In the drawing condition, children were asked to draw and tell about a time they were happy, sad or scared. In the re-enactment condition, children were asked to show and tell about the time they were happy, sad or scared. Irrespective of age, children in the draw condition (and in the re-enactment condition) reported more information than did children in the verbal condition (see also Salmon et al., 2003).

Although it is well-established that drawing increases the amount of verbal information that children report, the actual means through which drawing facilitates children's accounts is unclear. One possibility is that drawing may help to alleviate developmental limitations in children's verbal and memory abilities. That is, we know that young children encode more information about an event than they report and that they may have difficulty retrieving that information without specific cues (Baker-Ward, Gordon, Ornstein, Larus, & Clubb, 1993; Salmon, Bidrose, & Pipe, 1995; Simcock & Hayne, 2002, 2003). From this perspective, drawing might act as an additional retrieval cue (Butler et al., 1995; Wesson & Salmon, 2001); drawing one aspect of an event may remind children of other aspects of the same event. Additionally, it is possible that drawing may help young children to structure their narratives about the event by reminding them what they have or have not said, and what they yet need to describe (Butler et al., 1995; Wesson & Salmon, 2001). In addition to these cognitive factors, drawing also increases the length of the interview, makes the interviewer and child more comfortable, and may alleviate stress during an interview by shifting the focus from the child to the drawing (Pipe & Salmon, 2009; Willcock, 2004). Each of these factors may also increase the amount of information that children report.

Finally, it is also possible that drawing influences the way in which the interviewer asks questions about the target event. In previous studies, researchers have evaluated interviewers' questions by assessing the number of facilitative, non-directive prompts that interviewers used. For example, Wesson and Salmon (2001) examined the number of non-directive verbal prompts (e.g. 'uh huh', 'tell me more' and repetition of the child's words) that the interviewer used in draw interviews relative to the verbal or re-enactment interviews. They found that interviewers used more of these non-specific verbal prompts in the draw and re-enactment interviews, the interviews in which children report a greater amount of information relative to a standard verbal interview (see also Salmon et al., 2003).

Similarly, Gross, Hayne, and Drury (in press) examined interviewers' use of facilitative utterances (e.g. 'uh huh', 'wow' or repetition or rephrasing what the child had said previously) under different interview conditions. They found that the interviewer used more facilitative utterances when interviewing children in the draw group compared to the tell group and that the number of facilitative utterances used was related to the amount of information that children reported.

That is, as interviewers used more facilitative utterances, children reported more information about the target event.

Additionally, Willcock (2004) examined interviewers' behaviour in terms of the type and number of questions that interviewers ask in draw and in tell interviews. In that study, 5- to 6-year-olds were interviewed about a recent trip to a fire station. Interviewers' behaviour was examined in terms of the number of *prompts* (e.g. 'can you tell me more about that'), the number of *leading questions* and the number of *minimal responses* (e.g. 'uh huh'). Willcock (2004) reported that interviewers used twice as many prompts, and three times as many minimal responses, during draw interviews as they did during tell interviews. Although there was an association between the number of prompts and the amount of information that children reported (i.e. more prompts were associated with more information), the number of minimal responses was the best predictor of the amount of information that children subsequently reported.

Taken together, studies conducted using the draw and tell method have been highly consistent: Whether the events or experiences that children were asked to recall were educational, entertaining or emotional in nature, drawing substantially increased the amount of verbal information that young children reported, and it did so when children were interviewed over both short and long delays. In fact, in a meta-analysis of the experimental drawing literature, Driessnack (2005) estimated that the effect size for the technique is large ($d=0.95$). In addition, drawing also altered the interviewers' questions; draw interviews typically contained more facilitative, non-directive prompts and more open-ended questions. Finally, under optimal interview conditions which do not include leading questions or misinformation, children's reports while drawing are highly accurate (Pipe & Salmon, 2009).

Although drawing is a highly effective interview technique with young children, we do not know whether drawing continues to facilitate children's reports as they get older. Previous research would lead us to make two very different predictions about the effect of drawing on the verbal reports of older children. On one hand, because the drawing technique makes both the interviewer and the child more comfortable (Willcock, 2004), and increases the length of the interview (Butler et al., 1995), drawing might be an ideal interview technique for children of all ages. Furthermore, because retrieval strategies continue to develop during this period, and are not yet fully mature until late adolescence, older children may also benefit from a procedure that provides concrete retrieval cues (Butler et al., 1995; Salmon, 2001). In fact, research with other potential retrieval cues (e.g. props or objects from the event, contextual cues) has shown that these cues are just as effective for older children as they are for younger children (Gee & Pipe, 1995; Goodman, Quas, Batterman-Faunce, Riddlesberger, & Kuhn, 1997; Pipe & Wilson, 1994).

On the other hand, other research may lead us to predict that drawing may not be as effective with older children. For example, as children get older, their verbal and communication skills increase, making them better able to provide a full and comprehensive report of an event. Older children are also more likely to use internal retrieval strategies and may not be as

reliant on external retrieval cues to assist them. Furthermore, as children get older, they also become increasingly self-conscious about their drawing skills and increasingly concerned that their drawings resemble the objects that they have attempted to depict (Cox, 1992; Lowenfeld, 1947; Thomas & Silk, 1990). This increase in self-consciousness and in the desire to depict objects accurately may actually interfere with children's verbal reports if they are also given the opportunity to draw during an interview.

The overarching goal of the present research was to examine the effect of drawing on the verbal reports of 5- to 12-year-olds. We asked two main questions. First, does drawing continue to facilitate children's reports of a past event as they get older? Second, are there age-related changes in children's appraisal of their drawing that interferes with the facilitative effect of drawing? In addition, we also examined the effect of drawing on interviewer questions across this extended age range.

METHOD

Participants

A total of 90 children recruited from four local elementary schools and one intermediate school participated in the research. The children ranged in age from 5- to 12-years old; 20 of the children were 5- to 6-years old (11 male, 9 female), 23 of the children were 7- to 8-years old (9 male, 14 female), 26 of the children were 9- to 10-years old (10 male, 16 female) and 21 of the children were 11- to 12-years old (9 male, 12 female). The children were predominantly Pakeha (New Zealanders of European descent) and came from lower- to middle-income socio-economic backgrounds. All children had written parental consent to participate.

Interview

Each child was interviewed individually by one of two female interviewers during the day at school. To establish rapport, the interviewer began by discussing matters of general conversation (e.g. what the child had done at school that day). When the child appeared comfortable, the interview began. The interview was conducted in three parts.

First, children were asked to provide a narrative account of a time when they felt happy, sad, scared or angry (Gross & Hayne, 1998). Specifically, each child was asked 'Can you think of a time that made you feel really, really happy (or sad, or angry or scared)?' When it was clear that the child could think of such a time, then the interviewer asked him or her to tell or to draw everything that he or she could remember about the event. Each child was asked to draw and tell about two emotional events and was asked to only tell about two others (i.e. within-subjects design). When a child was asked to draw and tell about an emotion, he or she was given a set of felt markers and a large sheet of white paper and was instructed to draw and tell about the time that he or she felt happy, sad, angry or scared. If the child did not spontaneously narrate about what he or she was drawing, he or she was asked to do so.

In both conditions, the interviewer encouraged children to continue their narrative account through the use of minimal responses (e.g. 'uh huh', 'wow', 'really'). In addition, the interviewer prompted children by saying, 'Can you tell (or draw) me anything else about the time that you felt really, really happy (or sad, or angry or scared)?' The order in which children were asked to draw and tell, and the order of the emotion they were drawing or telling about was counter-balanced across participants.

Second, children's verbal ability was assessed using the Expressive Vocabulary Test (EVT, Williams, 1997). The EVT is a standardized measure of expressive verbal ability and vocabulary knowledge and takes between 10 and 30 minutes to complete.

Third, we asked children how they felt about drawing by providing them with the following statements; 'I like drawing pictures', 'I am embarrassed about my drawings' and asked them to respond to each statement by choosing from one of the following options; yes a little, yes a lot, no not much, no not at all. The interviewer read each statement and the response options to the child. Children were given two practice items first (e.g. 'I like eating ice cream') to ensure that they understood the task.

All interviews were recorded on DVD and were audio-taped. To assess the accuracy of children's accounts, parents were provided with a transcript of each of the emotional events that their child described and were asked to indicate whether the event actually happened (correct), may have happened (possible) or definitely never happened (incorrect). For example, if the child reported that his or her sad event was when their dog ran away from home, the parent was asked if that event actually happened, may have happened or definitely never happened. When parents indicated that the event had actually happened, they were also asked to decide whether each piece of information that the child had provided about the event (i.e. each clause of information) was correct, possible or incorrect.

Coding

All interviews ($n = 90$) were transcribed verbatim from the audio-tape of the interview and transcripts were checked against the DVD for accuracy. The transcripts were coded in the following way:

First, the transcript of each event was coded for the amount of information that was provided by the child; amount was determined by calculating the number of clauses of information that each child provided. A clause was defined as a simple sentence that contained an explicit or implicit verb such that there was one verb per clause (e.g. ('I was scared of kind of robbers,) so um. (I was scared of a manhole that was, um, was open). (I saw it at night'), three clauses coded as indicated by parentheses). Only verbal information was coded. That is, children were only given credit for things that they said during the interview. We did not code information in the drawings. Furthermore, additional information that was unrelated to the child's description of the emotional event (e.g. 'may I have a tissue?') was not coded. Information was only coded the first time that it was reported.

Second, interviewer behaviour was coded for the number and type of turns that the interviewer took while the child

narrated the event. Each interviewer turn was coded as one of the following:

- (a) *Open-ended question.* The interviewer used open-ended questions to prompt the child for more information (e.g. 'can you tell me more about that?').
- (b) *Closed question.* The interviewer used a prompt that required the child to give a yes, no or choice answer (e.g. 'was that hard?', 'is that all or is there more?').
- (c) *Leading question.* The interviewer used a prompt that suggested the desired answer or contained information that the child had not already given (e.g. 'I bet that was fun was it?', 'is that your mum?' when the child had not already indicated that he or she was drawing about his or her mother).
- (d) *Minimal response.* The interviewer used a prompt that encouraged the child to keep talking without asking a question (e.g. 'uh huh', 'really' or 'wow').

Interviewer turns that were off task and that were not related to the event that the child was describing (e.g. the interviewer commented on noises outside the room) were not coded.

Coding reliability

To ensure that the coding scheme was reliable, 25% of coded transcripts were randomly selected and recoded by an independent, trained coder. A Pearson product-moment correlation on the coding of information provided by children yielded an interobserver reliability coefficient of .99, $p < .05$. Interobserver reliability for type of interviewer turn (i.e. open-ended, closed, leading or minimal responses) was 91% ($k = .82$).

RESULTS

Expressive vocabulary test (EVT)

EVT scores were used to screen children for expressive language problems. EVT raw scores were obtained for each child and these raw scores were translated to a within-age-group standard score ($M = 100$, $SD = 15$). Ninety-eight per cent of children obtained standard scores within two standard deviations of the mean. Two children obtained standard scores that were two standard deviations below the mean ($M = 65$ and 67) suggesting some expressive language problems. Initial analyses showed that including or excluding these two children made no difference to the statistical outcomes. All children were therefore included in the following analyses.

Amount reported

Preliminary analysis revealed that there were no effects associated with the person who interviewed the child on the amount of information that children reported. Given this finding, the data were collapsed across interviewer for all subsequent analyses.¹

¹Preliminary analyses also indicated that of the total sample of 360 emotional narratives, there were 17 narratives that were outliers (i.e. 5% of total narratives), defined in terms of the number of clauses reported (i.e. two standard deviations above the mean number of clauses per age group). Identified outlier scores were replaced with the next highest score in that condition and age group.

Prior research has clearly shown that drawing increases the amount of information that young children report about their emotional experiences. One goal of the present experiment was to determine whether drawing was equally effective for older children. In order to determine the effects of age and test condition on the amount of information that children reported, we conducted a 2 (Test Condition) \times 4 (Age Group) \times 4 (Emotion) analysis of variance (ANOVA). Consistent with past research, children reported more information when they were given the opportunity to draw during the emotion interviews ($M = 23.16$ clauses, $SE = 1.33$) than when they were not ($M = 15.17$ clauses, $SE = 1.33$), $F(1, 359) = 17.87$, $p < .01$. Although older children reported more information than younger children, $F(3, 359) = 7.75$, $p < .01$, there was no Test Condition by Age Group interaction, indicating that drawing was equally effective for children of all ages (see Figure 1). Finally, there was also a main effect of emotion, $F(3, 380) = 3.21$, $p < .05$. *Post hoc*, pairwise comparisons using the Bonferroni correction revealed that children reported more information when they were talking about a happy event ($M = 23.39$ clauses, $SE = 1.89$) than when they were talking about an angry event ($M = 15.45$ clauses, $SE = 1.88$), $t(178) = 2.79$, $p < .01$. The amount of information that children reported about the sad and scared events were intermediate between these two extremes (sad event: $M = 17.77$ clauses, $SE = 1.89$; scared event: $M = 20.09$ clauses, $SE = 1.89$).

Finally, there were no significant interactions.

Accuracy

Recall that parents were provided with a transcript of their child's interview and were asked to evaluate the accuracy of their child's report of each emotional event. Accuracy was assessed in two ways. First, parents were asked to indicate whether the event that their child described actually happened, may have happened or definitely never happened. Second, if the parent reported that the event actually happened, they were also asked to indicate whether the details about the event were correct, possible or incorrect.

Sixty-three out of a possible 90 parent responses were returned (70%). The total number of events that parents evaluated was 252 (126 draw and tell events, 126 tell events). Overall, most children reported events that parents indicated had actually happened (correct). Parents indicated that only 8

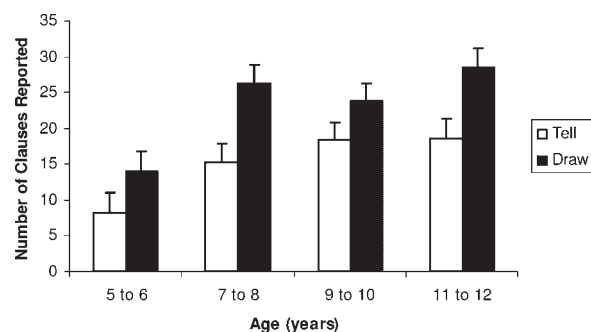


Figure 1. The mean number of clauses (and standard error) reported as a function of age and test condition

Table 1. The mean proportion of detail (and standard error) that parents reported actually happened (correct), may have happened (possible) or did not happen (incorrect)

	Tell	Draw
Correct	.91 (.02)	.84 (.03)
Possible	.06 (.01)	.11 (.02)
Incorrect	.03 (.01)	.05 (.02)

out of 252 events definitely never happened (incorrect). Three of the incorrect events were reported in the draw condition and six of the incorrect events were reported in the tell condition.

In order to evaluate the accuracy of the details of each event, we assessed parents' evaluation of the details of events which they indicated had actually happened. The proportion of correct, possible and incorrect details that children reported are shown in Table 1 as a function of interview condition. The data in Table 1 were subjected to three separate *t*-tests comparing the proportion of details that were correct, possible or incorrect as a function of interview condition. There was no effect of interview condition on any measure of accuracy (largest *t*-value = 1.78).

Drawing-related factors

Recall that each child was asked how he or she felt about drawing. Children could respond to the statement 'I like drawing pictures' or 'I am embarrassed about my drawings' by either agreeing with the statement (i.e. 'yes, a little', 'yes, a lot') or by disagreeing with the statement (i.e. 'no, not much', 'no, not at all'). The percent of children who agreed or disagreed with each statement was calculated separately for each age group. As shown in Table 2, 95% of children agreed with the statement 'I like drawing pictures'. Furthermore, most children did not feel embarrassed about their drawings (i.e. only 24% of children agreed with the statement, 'I am embarrassed about my drawings'). Not surprisingly, the oldest children (i.e. 11- to 12-year-olds) reported the highest level of embarrassment (see Table 2), but the majority of the older children still did not report being embarrassed, and there were no statistical differences between the age groups.

To determine if children's feelings of embarrassment about their drawings impacted on the amount of information that they reported, we conducted a *t*-test comparing the amount of information reported by children in the draw

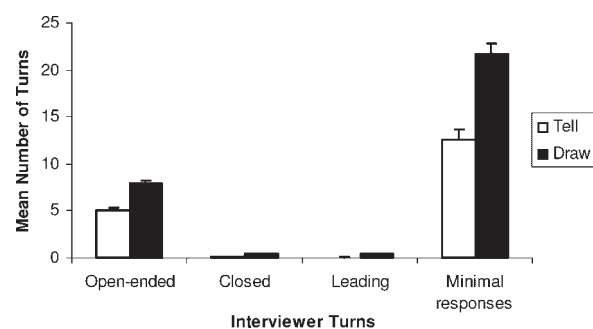


Figure 2. The mean number of interviewer turns (open-ended, closed, leading and minimal responses) reported as a function of test condition (draw or tell)

condition as a function of whether they were embarrassed by drawing or not. This analysis indicated that, even when children were embarrassed about their drawings, their embarrassment did not influence the amount of information that they reported (embarrassed group: $M = 23.37$ clauses, $SE = 4.13$; not embarrassed group: $M = 21.47$ clauses, $SE = 2.23$).

Interviewer questions

The mean number of open-ended questions, closed questions, leading questions and minimal responses that interviewers produced during the interviews were subjected to a 4 (Age) \times 2 (Test Condition) \times 4 (Question Type) ANOVA with repeated measures over question type (Greenhouse-Geisser correction factor). This analysis yielded a main effect of age, $F(1, 359) = 8.12$, $p < .01$, a main effect of condition, $F(1, 359) = 47.95$, $p < .01$ and a main effect of question type, $F(3, 359) = 187.65$, $p < .01$. These main effects were qualified by a Question Type \times Condition interaction, $F(3, 359) = 16.29$, $p < .01$ and a Question Type \times Age interaction, $F(9, 359) = 13.16$, $p < .01$. The Question Type \times Condition interaction is shown in Figure 2. To evaluate this interaction, *post hoc t*-tests comparing each pair of bars in Figure 2 were conducted using the Bonferroni correction. These analyses revealed that drawing increased the number of open-ended questions that interviewers asked, $t(88) = 7.94$, $p < .01$, and the number of minimal responses that interviewers used during the interview, $t(88) = 6.15$, $p < .01$. As shown in Figure 2, there were very few closed or leading questions asked in either interview condition and there was no effect of interview condition on either of these question types.

Table 2. The per cent of children who agreed with the questions 'I like drawing pictures', and 'I am embarrassed about my drawings' as a function of age

Age	5- to 6-years (%)	7- to 8-years (%)	9- to 10-years (%)	11- to 12-years (%)
Children who agree that 'I like drawing pictures'	100	96	92	91
Children who agree that 'I'm embarrassed about my drawings'	15	22	27	32

Table 3. The mean number of open-ended questions and minimal responses (and standard error) used by interviewers as a function of age group

	5- to 6-years	7- to 8-years	9- to 10-years	11- to 12-years
Open-ended questions	7.37 (.36)	7.70 (.34)	5.67 (.32)	5.22 (.35)
Minimal responses	11.01 (1.73)	20.92 (1.61)	14.15 (1.51)	22.36 (1.68)

To evaluate the Question Type \times Age interaction, separate one-way ANOVAs were conducted for each question type² as a function of age. These analyses revealed that the number of open-ended questions, $F(3, 359) = 10.22$, $p < .01$ and minimal responses, $F(3, 359) = 9.68$, $p < .01$ differed as a function of age group. As shown in Table 3, the interviewer asked more open-ended questions of children in the younger age groups (i.e. 5- to 6-year-olds, $p < .01$ and 7- to 8-year-olds, $p < .01$) than of children in the older age groups. Although the number of minimal responses varied according to age group, there was no systematic change as a function of increasing age; the 7- to 8-year-olds, $p < .01$ and 11- to 12-year-olds, $p < .01$, received the largest number of minimal responses.

Interviewer's questions and children's responses

Past research has shown that the amount of information that children report is influenced by the number of interviewer turns. For example, Willcock (2004) found that minimal responses, in particular, facilitated children's reports. In order to assess the relation between these variables in the present experiment, we entered the number of minimal responses, the number of interviewer prompts (i.e. open-ended, closed and leading questions), and the number of clauses that children reported into a hierarchical regression analysis. This analysis revealed that minimal responses alone explained 61% of the variance in the number of clauses that children reported (adj $R^2 = .612$, $p < .01$). Open-ended questions also made a significant contribution, $p < .05$, but explained only an additional 5% of the variance (adj $R^2 = .617$). Thus, consistent with Willcock (2004), the best predictor of the number of clauses that children reported was the number of minimal responses that the interviewer used.

DISCUSSION

Prior research has repeatedly shown that, when young children are given the opportunity to draw during a memory interview, they report more information than when they tell alone. In the present experiment, we investigated whether drawing continues to facilitate children's reports of past events as they get older. We found that 5- to 12-year-olds reported more information when asked to draw and tell about a past emotional event than did children only asked to tell. Consistent with prior research conducted with young children, we also found that drawing had no effect on the accuracy of children's reports. Parental reports indicated that

children were as accurate when they were drawing and telling about an emotional event as they were when they were telling alone. Also consistent with prior research with young children, we found that when children drew, interviewers asked more open-ended questions and provided more minimal responses than they did when children were telling alone. The number of minimal responses, in particular, was highly correlated with the amount of information that children of all ages reported.

In the present experiment, we also examined age-related changes in children's appraisal of their drawing ability and whether those appraisals influenced the effectiveness of the drawing technique. We were originally concerned that older children's increasing self-consciousness about their drawing skills might interfere with their verbal reports, negating the facilitative effect of drawing. When we examined children's feelings about their drawings, we did find that older children were more likely to report being embarrassed by their drawings but we also found that embarrassment had no impact on the amount of information that children reported. Children in the draw condition who were embarrassed about their drawings reported as much information as children who were not embarrassed. Although a higher proportion of older children were embarrassed about their drawing, the majority of older children also reported that they liked drawing pictures. Clearly, drawing is not only useful in terms of facilitating children's verbal reports, but it is also an interview tool that children of all ages clearly enjoy.

The present data have both theoretical and practical implications for interviewing children about their past experiences. From a theoretical perspective, the present data shed additional light on why drawing might facilitate children's reports. Although a number of explanations have been considered, most of these explanations have focussed on the effect of drawing on the child *per se*. In contrast, the present findings add to a growing body of research that shows that drawing works primarily because it alters the interviewers' questions and minimal responses during the interview. In the present experiment, as in others, interviewers asked more open-ended questions and provided more minimal responses when children were allowed to draw and tell about past events rather than to just tell (see Gross, Hayne, & Drury, in press; Wesson & Salmon, 2001; Willcock, 2004). Of these question types, the best predictor of the number of clauses that children reported was the number of minimal responses that the interviewer used.

Why might minimal responses be the best predictor of the amount of information children report? On one hand, drawing may increase the number of minimal responses that the interviewer makes which, in turn, increases the amount of information that children report (i.e. minimal responses are driving the effect). On the other hand, drawing may increase

²Because very few closed and leading questions were asked and the concern that the low frequencies of these questions would violate the assumption of statistical analyses, these questions were not included in these analyses.

the amount of information that children report which, in turn, increases the number of minimal responses the interviewer makes (i.e. the minimal responses are a byproduct of children's responses). Because of the nature of the present experiment, we are not able to differentiate between these two explanations. In our ongoing research, we are deliberately manipulating the number of minimal responses that interviewers provide and examining the amount of information that children report. It is important to note, however, that even when the number of minimal responses was high, children's accuracy remained high as well. This finding was obtained despite the fact that the interviewers had no *a priori* information about the events that the children were describing. Given this, we are increasingly confident that, even when children are encouraged to report more through drawing, they still stick to the facts and do not confabulate about the target event.

From a practical perspective, the present findings establish an extended age range for which drawing might be useful in clinical and forensic interviews. Although older children have better verbal, memory and retrieval skills (Peterson et al., 2007; Powell, Thomson, & Ceci, 2003; Winsler, Naglieri, & Manfra, 2006), and provide more information about past events than do younger children (Fivush, 1993; Ornstein, Baker-Ward, Gordon, Plephrey, Tyler, & Gramzow, 2006; Peterson et al., 2007), the information they provide is still limited when compared to the amount of information that an adult would provide about a similar event (Sutherland & Hayne, 2001). Given this, it is important to develop new tools that help children of all ages report their past experiences. The findings of the present experiment suggest that drawing may be a useful tool for obtaining information from children of all ages.

In recommending that drawing is a useful interview technique in applied settings, we need to make two additional points. First, it is important to note that in the present experiment, we focussed exclusively on what children said. We did not try to interpret what they had drawn. To date, there is no empirical evidence to support the use of drawing as an interpretive or a projective tool. Second, we underscore that in this experiment, as in previous experiments reviewed here (i.e. Butler et al., 1995; Gross & Hayne, 1998, 1999; Gross et al., in press; Salmon et al., 2003; Wesson & Salmon, 2001; Willcock, 2004), children were interviewed under optimal questioning conditions. Overall, interviewers asked open-ended, non-suggestive, non-leading questions. Unfortunately, research in our laboratory and in others has clearly shown that drawing does not protect children from the negative effects of interviews that are highly suggestive, leading or misleading, and drawing does not prevent children from reporting false information that they have obtained from another source (Bruck, Melnyk, & Ceci, 2002; Gross, Hayne, & Poole, 2006; Strange, Garry, & Sutherland, 2003; for review, see Pipe & Salmon, 2009). In fact, under these conditions, drawing actually enhances children's errors. Given that drawing cannot protect children from questioning techniques that are suggestive or misleading, and that drawing may in some instances enhance children's tendency to report false information, recommendations that drawing be used in clinical or forensic contexts

require careful consideration. As with any interview technique, children should be asked open-ended questions about the events that they are being asked to describe and their exposure to leading or misleading information outside the context of the interview should be avoided.

In conclusion, drawing has the potential to be useful in clinical and forensic contexts. It is a developmentally appropriate tool, an activity that children of all ages enjoy, and under optimal interview conditions, it elicits accurate accounts and increases the amount of information that children report. Furthermore, when children are given the opportunity to draw, interviewers ask more open-ended questions, which are associated with higher accuracy. They also make more minimal responses, which may signal to the child that what he or she is saying is interesting and important. To date, all of the empirical research on the effect of drawing on children's reports has involved analogue studies of non-clinical populations of children. Given the consistency of the existing database, we are now poised to take this technique into the clinic. We are currently examining the effect of drawing on children's reports of their hospitalization; we are also examining the effect of drawing on children's reports in the context of clinical assessment. Taken together, the results of these ongoing studies will ultimately determine the effectiveness of the drawing technique with both children and clinicians in applied settings.

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