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Comparing the effects of drawing and verbal recall techniques on children's memory accounts

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The present study compared the amount and accuracy of information Taiwanese children reported about a staged event in verbal-only and drawing-assisted interviews. We also tested further whether verbosity was a valid indicator of the accuracy of children's memory reports (Koriat & Goldsmith, 1994, 1996) in a non-Western sample. Eighty-four first-grade elementary school children participated in a staged event involving a novel interactive puppet show followed by a drawing activity (drawing of the target event or the school), and were subsequently given a 10-minute memory interview. They were randomly assigned to a verbal cued-recall interview condition or a drawing-assisted interview condition. We did not find significant differences in the amount and accuracy of details reported between the two interview conditions. Our findings also revealed that the quantity of children's reports was positively related to the number of correct details reported, indicating that the children in our study did not demonstrate a quantity-accuracy tradeoff.

Key words: Children's memory, investigative interviewing, interviewing aids.

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INTRODUCTION

A common challenge in investigative interviews with children is the difficulty in eliciting memory accounts that are rich, elaborate and reliable. It is common, therefore, for interviewers to utilize interviewing or memory aids such as human figure diagrams (body diagrams), anatomical dolls, photographs, and drawing in interviews with children. Previous laboratory and field research have found benefits of drawing (Barlow, Jolley & Hallam, 2011; Butler, Gross & Hayne, 1995; Driessnack, 2005; Gross & Hayne, 1999; Katz & Hershkowitz, 2010; Patterson & Hayne, 2011; Poole & Dickinson, 2014; Salmon, Pipe, Malloy & Mackay, 2012; Wesson & Salmon, 2001). Drawing as a non-verbal tool reduces the reliance on verbal skills as well as generate "cues" that enhance memory retrieval (Wesson & Salmon, 2001). Poole and Dickinson (2014) demonstrated that comfort drawing did not impair the quality of information recalled in typically-developing children. There is also evidence, however, that drawing during an interview may lead to inaccurate memory reports (e.g., Bruck, Melnyck & Ceci, 2000; Macleod, Gross & Hayne, 2016; Otgaar, van Ansem, Pauw& Horselenberg, 2016; Strange, Garry & Sutherland, 2003).

Drawings are commonly used in investigative interviews in East Asia, yet no known study has examined its effects. Previous studies have typically compared drawing against a verbal-only condition, yet it is unclear whether the benefits of drawing result from the act of drawing itself or more specifically drawing of the target (to-be-remembered) event. The present study sought to add to the literature by testing the effects of drawing in a non-Western sample and hopefully shed more light on the effects of drawing compared with verbal questioning methods. Thus, in our study all children drew before the interview (draw *then* tell), allowing us to compare more precisely the effects of drawing and verbal retrieval conditions.

Another aim of this study was to investigate whether memory quantity is an accurate indicator of memory quality. According to Koriat and Goldsmith (1994, 1996), a quantity-accuracy trade-off might occur in children's memory narratives – when given incentives for responding accurately, adults and children provide less information overall (Koriat, Goldsmith, Schneider & Nakashdura, 2001). One possible explanation is that talking a lot may reduce one's ability to monitor own recall (Kulkofsky, Wang & Ceci, 2008). However, there has been no research addressing the quantity-accuracy tradeoff in non-Western children's memory accounts. This is a significant gap considering how talkative or verbose children are may be heavily influenced by the cultural context. In East Asian cultures, children are often expected to be "seen and not heard", so children in such cultures are typically less spontaneous talkers and more careful when they speak. Research on parent-child reminiscence revealed that Chinese mothers were more likely than American mothers to pose and repeat factual questions and elicit correct answers from their children in a way similar to a memory test (Wang, Leichtman & Davies, 2000). Hence it is questionable whether East Asian children might demonstrate the same quantity-accuracy tradeoff found in Western children.

METHOD

Participants

Our sample included 84 first-grade children (M_{age} = 6.97, *S.D.* = 2.82; 45 males, 39 females) from five elementary schools in Northern Taiwan. Parents and the class teacher of all participating children signed an informed consent form, and the children provided verbal assent before they were interviewed.

Procedure

Children participated in a 7-minute staged event involving a novel interactive puppet show, and were subsequently given a 10-minute memory interview. They were randomly assigned to one

of two interview conditions – verbal cued-recall and drawing-assisted cued recall. The current study departed from previous studies by asking the children to "draw *then* tell", rather than draw *and* tell. By doing this, we could ensure that all children were interviewed in similar fashion and in the same timeframe, thereby giving us more precision in comparing the drawing condition against the verbal conditions.

Children in the verbal condition drew a picture of their school, while the drawing group drew the event (every child did so). Following drawing, participants were given a one-to-one 10-minute interview by a trained research assistant. The interview procedure began with a rapport-building phase in which interviewers prompted children to talk about their hobbies and favorite things (e.g., food, toy). When the child was deemed ready to proceed with the substantive part of the interview (talking about the target event), the interviewer used one of two memory retrieval formats (verbal cued-recall or drawing-assisted cued recall), beginning with a statement that the interviewer had heard about the child taking part in an activity. In the cued-recall condition, the child was first prompted to talk about what happened, followed by facilitators (e.g., "and then?", "okay …"), and then follow-up prompts were formulated using details the child had already mentioned (e.g., "You said …Tell me more about that."). In the drawing-assisted condition, the child's drawing was placed in front of her, and prompted with "Tell me what happened using what you have drawn here". Every child in the drawing-assisted condition referred to their drawing while recalling the event and none of the children refused to provide a verbal recall by stating that they had already drawn the event. Some children added fantastical elements in their drawings, but they were mostly minor additions such as a star or flower. They did not draw any new characters or story elements that were clearly absent in the target event. Following the child's response, the interviewer prompted the child further with facilitators and cued-recall prompts until her recall was exhausted. At the end of the interview, children were given a small gift as a token of appreciation.

Coding

All interviews were transcribed verbatim and coded according to accuracy and verbosity. Units of information were coded as core components of the show (story elements and interactive actions), giving the total of 24 correct details (units). We coded accuracy by identifying correct and incorrect details out of the 24 units. Repeated details were excluded. Verbosity was measured by computing the total number of words spoken.

Inter-rater reliability was checked by having 20% of the transcripts independently coded by two trained research assistants. There was 89–95% agreement between the coders for correct and incorrect details, as well as verbosity.

RESULTS

Analyses of variance and correlations were used to determine whether the accuracy of children's memory reports varied according to retrieval method and whether verbosity was a possible indicator of accuracy.

A one-way analysis of variance (MANOVA) did not show significant main effects of condition on the total number of works spoken, number of details reported, number of correct details, and number of incorrect details. Table 1 displays the means and standard deviations of the dependent variables.

Table 2 displays the Pearson correlations (N = 84) between the number of words spoken, number of details reported and the numbers of correct and incorrect details reported. Our findings revealed that the number of words spoken and number of details reported were positively related to each other, and both were positively associated with the number of correct details (but not incorrect details) reported. That is, the more words children spoke, the more details they reported, and the more likely they were to report correct details.

DISCUSSION

We did not find significant differences in the amount and accuracy of details reported between the verbal-only and drawing-assisted interview conditions in a non-Western sample. Drawing of the target event was not significantly associated with more information and higher accuracy than verbal techniques, but it also did not appear to increase inaccuracy. We speculate that the self-generated cues children produced via drawing might not have worked better than verbal cued recall prompts because what the children drew were probably too visually different from real life details. For cues to function effectively, they need to provide maximal overlap with contents present at encoding (Tulving & Thomson, 1973), thus the visual discrepancies in the drawing retrieval condition may have prevented children from using deeper-level processing during memory recall.

One could also argue that we did not find differences between the verbal and drawing conditions because we instructed children to "draw *then* tell", rather than draw *and* tell. By requiring all the participants to draw, we could assume that children in all interview conditions may have been similarly affected. In a way drawing for the verbal condition children acted as a distractor task

Table 1. *Means and standard deviations of the amount and accuracy of children's reports according to interview condition*

	Cued Recall (N = 38)	Drawing (N = 46)
Word Count	287.74 (200.51)	229.41 (139.87)
Number of details	7.85 (3.71)	7.41 (2.86)
Number of correct details	7.30 (3.75)	7.00 (2.85)
Number of incorrect details	0.55 (1.10)	0.41 (0.65)

Table 2. *Pearson correlations between the amount and accuracy of children's reports*

	1	2	3	4
Word count	-	0.52**	0.54**	–.09
Number of details		-	0.96**	0.11
Number of correct details			-	–0.19
Number of incorrect details				-

Note: $^{**}p < 0.001$.

to better equate the level and type of verbal processing required between the verbal-only and drawing retrieval conditions. Nonetheless, it seems that despite this manipulation we still failed to find significant benefits of drawing in our study, suggesting that the children in our sample may recall the target event just as well using verbal as drawn self-generated cues. However, it is worth noting that although children who drew the target event did not demonstrate significantly better memory performance than children who verbally recalled the event, drawing did not seem to be associated with lower accuracy rates as found in previous research. Another possibility, therefore, might be that children who drew the target event reported fewer accurate details because they felt they had already recalled the event non-verbally.

Our findings also revealed that both the number of words spoken and number of details reported were positively related to the number of correct details reported, indicating that the children in our study did not demonstrate a quantity-accuracy trade-off. In contrast, the more children spoke and the more details they reported, the higher the accuracy of their reports. Cross-cultural research has revealed that Chinese mothers tend to elicit correct answers from their children in a way similar to a memory test (Wang et al., 2000). We speculate that perhaps Taiwanese children's socialization may lead them to exercise more caution when they speak, and this may enhance source-monitoring or accuracy check during memory recall. Other possible explanations are that the children in our study did not demonstrate a trade-off because they simply remembered the event well and were asked open-ended questions, over which they had better cognitive control. Further research should therefore include events that are harder to remember and close-ended questions. Worthy of concern were the findings that the children in our study reported on average only less than half of the details about the event, even though they were mostly accurate. This is a problem in the forensic context, since child witnesses are expected to provide detailed accounts of their experiences. We propose that future research include a non-Asian sample and further explore ways in which we can increase the level of detail in children's memory reports without compromising accuracy.

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REFERENCES

Barlow, C. M., Jolley, R. P. & Hallam, J. L. (2011). Drawing as memory aids: optimizing the drawing method to facilitate young children's recall. *Applied Cognitive Psychology*, *25*, 480–487.

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.

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

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

Gross, J. & Hayne, H. (1999). Drawing facilitates children's verbal reports after long delays. *Journal of Experimental Psychology: Applied*, *5*, 265–286.

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

Koriat, A. & Goldsmith, M. (1994). Memory in naturalistic and laboratory contexts: Distinguishing the accuracy-oriented and quantity-oriented approaches to memory assessment. *Journal of Experimental Psychology: General*, *123*, 297–315.

Koriat, A. & Goldsmith, M. (1996). Monitoring and control processes in the strategic regulation of memory accuracy. *Psychological Review*, *103*, 490–517.

Koriat, A., Goldsmith, M., Schneider, W. & Nakash-Dura, M. (2001). The credibility of children's testimony: can children control the accuracy of their memory reports? *Journal of Experimental Child Psychology*, *79*, 405–437.

Kulkofsky, S., Wang, Q. & Ceci, S. J. (2008). Do better stories make better memories? Narrative quality and memory accuracy in preschool children. *Applied Cognitive Psychology*, *22*, 21–38.

Macleod, E., Gross, J. & Hayne, H. (2016). Drawing conclusions: The effect of instructions on children's confabulation and fantasy errors. *Memory*, *24*, 21–31.

Otgaar, H., van Ansem, R., Pauw, C. & Horselenberg, R. (2016). Improving children's interviewing methods? The effects of drawing and practice on children's memories for an event. *Journal of Police and Criminal Psychology*, *31*, 279–287.

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

Poole, D. A. & Dickinson, J. J. (2014). Comfort drawing during investigative interviews: Evidence of the safety of a popular practice. *Child Abuse & Neglect*, *38*, 192–201.

Salmon, K., Pipe, M.-E., Malloy, A. & Mackay, K. (2012). Do non-verbal aids increase the effectiveness of "best practice" verbal interview techniques? An experimental study. *Applied Cognitive Psychology*, *26*, 370–380.

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

Tulving, E. & Thompson, D. M. (1973). Encoding specificity and retrieval processes in episodic memory. *Psychological Review*, *80*, 352–373.

Wang, Q., Leichtman, M. D. & Davies, K. I. (2000). Sharing memories and telling stories: American and Chinese mothers and their 3-year-olds. *Memory*, *8*, 159–177.

Wesson, M. & Salmon, K. (2001). Drawing and showing: helping children to report emotionally laden events. *Applied Cognitive Psychology*, *15*, 301–319.

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