Body Maps Do Not Facilitate Children’s Reports of Touch

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SUMMARY
In two experiments, we assessed children’s ability to use body maps to report where they were touched. Five- to 6-year-old children participated in a contrived event and were interviewed either immediately or after a delay. Overall, children’s reports were incomplete and inaccurate. We conclude that body maps do not facilitate children’s reports of touch and should not be used in clinical or legal interviews with children of this age. Copyright © 2006 John Wiley & Sons, Ltd.

When a child is physically or sexually abused, he or she is typically the only witness to the crime; his or her account of the event is often crucial in prosecuting the offender and in establishing the most appropriate conditions for care and protection. In both the criminal and the family court, the primary challenge is to elicit information that is both complete and accurate. Because children may be reluctant to disclose abuse or may not have mastered the vocabulary required to describe what happened to them, psychologists have developed a number of nonverbal techniques that allow children to ‘show’ rather than to ‘tell’ about the abusive event (Saywitz, Goodman, Nicholas, & Moan, 1991). In one of these techniques, children are allowed to interact with anatomically detailed (AD) dolls. Sometimes these dolls are used by the interviewer to introduce discussion about body parts and sexual activity and sometimes the dolls are used to augment children’s verbal reports by allowing them to show the interviewer what happened.

Unfortunately, there is considerable evidence that AD dolls do not augment children’s reports and that they also lead children to make more errors (e.g., Bruck, Ceci, & Francoeur, 2000; Bruck, Ceci, Francoeur, & Reznick, 1995; Saywitz et al., 1991). For example, Saywitz et al. (1991) interviewed 5–7-year-olds about a prior medical examination. As part of the examination, half of the children had received a genital check-up. During the interview, 1 week or 1 month later, children were first asked to provide a free-recall account of the medical examination and they were then provided with an AD doll and medical props and were asked to show what happened. Saywitz et al. found that the dolls failed to elicit any additional information about genital touch and that they also increased the number of errors that children made during the interview (see also, Bruck et al., 1995, 2000).

In light of growing concerns regarding AD dolls, some interviewers have turned to AD drawings (i.e., two-dimensional human figure drawings) as an alternative way to facilitate

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children’s reports. Like AD dolls, AD drawings are thought to help children to show what has happened to them. Unlike AD dolls, however, the two-dimensional nature of AD drawings makes them less likely to elicit large amounts of exploration and fantasy play that may be mistaken by an interviewer as evidence of abuse (Lamb, 1994). Due to these perceived advantages, AD drawings are extremely popular in both clinical and legal settings (Groth, 1984; Kendall-Tackett, 1992). For example, Conte, Sorensen, Fogarty, and Rosa (1991) found that 66% of the child protection workers they surveyed used drawings of the human body during the assessment process.

Despite professional enthusiasm for AD drawings, there is a dearth of empirical research on the validity of their use. To the best of our knowledge, only two published reports have examined the effect of these drawings on the amount of information that children report (Aldridge et al., 2004; Steward et al., 1996); only one of these studies was conducted in such a way that it was possible to measure accuracy (Steward et al., 1996). In that study, Steward et al. (1996) interviewed 3–6-year-old children about a medical examination immediately following the examination, after a 1-month delay, and after a 6-month delay. Children were either given a standard verbal interview, a verbal interview combined with a human figure drawing, or a verbal interview combined with AD dolls and medical props. In all conditions, children were asked a series of open-ended and prompted questions about the medical examination. Children interviewed with props (e.g., drawings or dolls and medical items) were asked to use these items to demonstrate what happened during the event.

Across all delays, children interviewed with props reported approximately two more correct touches than those in the standard verbal interview condition (see also Aldridge et al., 2004). Unfortunately, children interviewed with props still reported only 30% of the touches that they experienced. Moreover, children interviewed with props also made more errors. For example, children in the verbal interview condition made no errors of commission regarding genital touch when they were interviewed immediately following their medical examination, but 7.5% of children interviewed with the drawings erroneously indicated that they had received a genital touch. These findings indicate that the reports elicited from children using drawings may be both incomplete and inaccurate.

In the absence of additional research, it is difficult to know whether the Steward et al. data reflect an isolated finding or a more fundamental problem that warrants concern. The goal of the present study was to further assess the effect of human figure drawings on the content and accuracy of children’s reports. Children participated in a contrived event in which they were touched several times by an unfamiliar adult. Children were then interviewed immediately or after a delay and were asked to indicate where they had been touched using a human figure drawing.

**EXPERIMENT 1**

The specific aims of Experiment 1 were two-fold. First, we examined 5–6-year-old children’s ability to use a human figure drawing to report where they had been touched. Second, there is increasing recognition that socioeconomic status influences children’s access to educational and social opportunities, which in turn, impacts on their cognitive development (Turkeimer, Haley, Waldron, D’Onofrio, & Gottesman, 2003). Thus, socioeconomic status may be an important source of individual variability that contributes to children’s ability to use props like drawings to show what has happened to them.
In Experiment 1, we examined the potential effects of children’s socioeconomic background on the content and accuracy of their reports.

**Method**

**Participants**
A total of 125, 5–6-year-old children were recruited from four local primary schools in Dunedin, New Zealand. The schools were selected on the basis of the decile ratings they had been assigned by the New Zealand Ministry of Education. This rating is a socioeconomic indicator based on national census data obtained from households within each school’s catchment area (Ministry of Education, 1997). Schools assigned decile ratings of 8–10 are classified as high socioeconomic schools. Schools assigned decile ratings of 4–7 are classified as average socioeconomic schools. Schools assigned decile ratings of 1–3 are classified as low socioeconomic schools.

In the current experiment, 40 children (29 males, 11 females; mean age = 5.99 years, SD = 0.51 years) attended a school assigned a decile rating of 10, 46 children (32 males, 14 females, mean age = 5.93, SD = 0.61 years) attended a school assigned a decile rating of 5, and 39 children (23 males, 16 females, mean age = 5.88 years, SD = 0.60 years) attended schools assigned a decile rating of 1 or 2. The children were predominantly of European descent, and all had written consent from their caregivers to participate in the study.

**Procedure**

**Event**
All children participated in a class trip to the Dunedin Central Fire Station. A male confederate, dressed in a blue fire-service uniform, arrived in the children’s classroom and invited them to visit Dunedin Central Fire Station. The confederate helped each child to dress in a toy fireman’s hat and a yellow top that had the words ‘Fire Service’ emblazoned in red on the front. During this interaction, the confederate touched each child in five different locations: on the head when his or her hat was put on, under both arms when his or her top was tied, and on both shoulders when he or she was turned around three times to ‘turn you into a fire fighter.’

The children then traveled with the confederate by double-decker bus to the Dunedin Central Fire Station. When they arrived at the fire station, a legitimate member of the fire service who was also dressed in a fire service uniform showed the children around the station and explained the kinds of things that fire fighters did there. When they returned to the school, a female confederate thanked each child for being so good at the fire station and placed a brightly colored cardboard medal around the child’s neck. The children were allowed to take this medal home.

**Interview**
One month after the trip to the fire station, a female experimenter who had not been present at the event interviewed each child individually. Each child was shown a medal identical to the one that he or she had received during the event and was asked a series of general and specific questions about the trip to the fire station. This portion of the interview was part of a larger study on children’s memory development (Willcock, 2004) and will not be discussed further here.
Next, each child was asked to use a drawing that matched his or her gender to show the location of where he or she had been touched during the event. Examples of the drawings are shown in Figure 1. Because the drawings used here were clothed, and did not actually include anatomical detail, we will refer to the drawings as body maps.

During the body map portion of the interview, children who had previously recalled putting on a costume during the fire station interview were given the following instructions:

You have already told me that you had to put on a costume when you visited the fire station. I heard that [the male confederate’s name] helped you put on the costume. What I want you to do now is to use this picture to show me where [the male confederate’s name] touched you when he put the costume on. Point to where he touched you.

For those children who had not previously reported that they had put on a costume, the interviewer introduced the task by saying:

I heard that [the male confederate’s name] helped you put on a costume to wear when you went to the fire station. What I want you to do now is to use this picture to show me where [the male confederate’s name] touched you when he put the costume on. Point to where he touched you.

The interviewer then drew a cross on the drawing where the child indicated that he or she had been touched. The only additional prompt provided by the interviewer was ‘Did [the male confederate’s name] touch you anywhere else?’

**Coding**

To examine children’s accuracy when using body maps, touches located on the shoulders, on the sides of the figure (above the waist), and on the top of the head were scored as correct touches. Touches located on any other part of the figure were scored as incorrect. Furthermore, touches within 1 cm$^2$ of the genital area were scored as genital touches, while touches within 1.5 cm$^2$ of the breast region were scored as breast touches.
Results and discussion

The data from 10 children were not included in the current analyses because they said that they had not been touched during the fire station event.

Correct touches

The number of correct touches that children reported was submitted to a 3 (socioeconomic status: low, average, high) × 2 (gender) analysis of variance (ANOVA). There were no main effects of socioeconomic status or gender and there was no interaction. On average, children reported less than two of the five locations in which they were touched (M = 1.8, SE = 0.14). Overall, children’s reports were only 37.6% complete. In fact, only 4 out of 115 children reported being touched in all 5 locations.

Incorrect touches

The number of incorrect touches that children reported was also submitted to a 3 (socioeconomic status) × 2 (gender) ANOVA. There were no main effects of socioeconomic status or gender and there was no interaction. On average, children indicated that they had been touched in more than three places where they had not been touched (M = 3.6, SE = 0.47). Overall, slightly less than half (47.8%) of the total number of responses that children made were accurate.

Sexual touch

Given that false allegations of abuse are only likely to arise when children incorrectly indicate touch to their genitals or breasts, we also examined the frequency with which children incorrectly indicated that they had experienced these kinds of touches. Overall, 11.3% of the children indicated that they had received at least one genital touch and 25.5% of the children indicated that they had received at least one touch to the breast.

In summary, children were extremely poor at using body maps to show where they had been touched when they were interviewed after a 1-month delay. Although it is often assumed that body maps facilitate children’s reports, the results of the present experiment are highly consistent with those reported by Steward et al. (1996); children’s reports of touch using body maps were incomplete and highly inaccurate. Overall, children interviewed with body maps reported less than half of the touches that they actually received and they made a large number of errors. In fact, only 2 children out of 115 who were interviewed (1.7%) made no errors of commission or omission.

EXPERIMENT 2

In Experiment 1, children were interviewed about touches that occurred in the context of a larger event, 1 month earlier. Under these conditions, children’s failure to use the body maps to accurately report where they had been touched may have been due to the complexity of the original event, to the memory demands imposed by the delay, or to both. The purpose of Experiment 2 was to examine whether children could use body maps to indicate the location of touch under less challenging conditions. Given that there was no effect of SES on the results of Experiment 1, children in Experiment 2 were recruited without reference to their socioeconomic background.
Method

Forty-six 5–6-year-old children were invited with their caregivers to the Early Learning Project laboratory to take part in the present experiment. Prior to arriving at the laboratory, the caregivers were contacted by telephone. At this time, the experimental procedure was explained and oral consent was obtained for the child to take part. Upon arrival at the laboratory, a confederate greeted the child and his or her caregiver. The confederate established rapport with the child and then asked the child if he or she wanted to dress up in a fire service costume. After obtaining the child’s assent, each child was touched in five distinct locations (on the head, on both shoulders, and under both arms) as he or she put on the fire service costume. This procedure was identical to that employed in Experiment 1 when touching was imbedded in the context of a larger event.

Each child was interviewed once following one of three delays: immediately (N = 15), or 24 hours (N = 15), or 1 month (N = 16) after the event. During the interview, an adult who had not been present when the child put on the costume asked the child to use a body map to show where he or she had been touched when he or she dressed in the fire service costume. The interviewer introduced the task by saying:

I heard that last time you were here (a minute ago) [the confederate’s name] helped you put on a fire service costume. What I want you to do now is I want you to use this picture to show me where [the confederate’s name] touched you when she put the costume on. Point to where she touched you.

The criteria used to score children’s performance on the touch task were identical to those used in Experiment 1.

Results

Correct touches

The number of correct touches that children reported was submitted to a 3 (delay: immediate, 24 hour, 1 month) × 2 (gender) ANOVA. This analysis yielded a significant main effect of delay, F(2, 40) = 4.04, p = 0.025. Post hoc t-tests revealed that children indicated more correct touches when interviewed immediately after putting on the fire service costume than when interviewed after a 24-hour [t(28) = 2.59, p = 0.015] or a 1-month delay [t(29) = 2.22, p = 0.034]. The number of correct touches indicated by children in these latter two conditions did not differ (see Table 1). Even when interviewed immediately, however, children still reported less than half of the touches they had received. In fact, only 1 child out of 46 reported being touched in all 5 locations. There was no main effect of gender on the number of correct touches reported and no interaction.

Table 1. The mean number of correct touches (max = 5) and the number of errors reported by children in Experiment 2 as a function of the delay between the event and the interview. Standard errors are shown in parentheses

<table>
<thead>
<tr>
<th>Delay</th>
<th>Correct touches</th>
<th>Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate</td>
<td>2.47 (0.32)</td>
<td>1.40 (0.41)</td>
</tr>
<tr>
<td>24 hours</td>
<td>1.33 (0.31)</td>
<td>1.60 (0.51)</td>
</tr>
<tr>
<td>1 month</td>
<td>1.25 (0.31)</td>
<td>1.63 (0.39)</td>
</tr>
</tbody>
</table>
Incorrect touches
The number of incorrect touches that children reported was submitted to a 3 (delay) × 2 (gender) ANOVA. There were no main effects of delay or gender and there was no interaction. On average, each child indicated that he or she had been touched in more than 1 ($M = 1.5$, SE = 0.25) place where he or she had not been touched (see Table 1).

Sexual touch
As in Experiment 1, we examined the frequency with which children incorrectly indicated that they had experienced a genital or a breast touch. Overall, 7.1% of children indicated that they had received at least one genital touch and 23.8% of the children indicated that they had received at least one touch to the breast.

Consistent with the findings of Experiment 1, the children in Experiment 2 were extremely poor at using body maps to show where they had been touched. Even when children were interviewed with body maps immediately after they had been touched, they reported at least one incorrect touch 60% of the time.

GENERAL DISCUSSION

The results of two experiments clearly demonstrated that children were unable to use body maps to show where they had been touched. Irrespective of socioeconomic status (Experiment 1) and the delay between the event and the interview (Experiment 2), children failed to report a large number of touches that they had experienced and more than half of the touches that children did report were incorrect. Even when the event was very simple and the memory demands of the task were virtually eliminated, children were unable to use body maps to provide complete and accurate accounts of where they had been touched.

In applied settings, the ramifications of making mistakes when using body maps are far reaching; both errors of omission and errors of commission can have negative consequences. In cases of actual abuse, for example, errors of omission may lead to wrongful acquittal leaving a guilty perpetrator free to re-offend. The results of the present study clearly show that children interviewed with body maps do not provide complete accounts of prior touch, raising fundamental questions about why drawings should ever be introduced in the first place. In cases in which abuse has not occurred, errors of commission may result in wrongful conviction. It was particularly alarming that all of the females attending the low socioeconomic schools (Experiment 1), and 80% of the other children participating in the current experiments made at least one false allegation of touch. Moreover, approximately 10% of children erroneously indicated that they had been touched on the genitals, while 25% of children erroneously indicated that they had been touched on the breast.

Despite dramatic differences in the procedure, the present findings are highly consistent with those previously reported by Steward et al. (1996). In Steward et al., for example, children were interviewed about a medical examination; in the present study, children were interviewed about a more innocuous event. Furthermore, in Steward et al, children were interviewed with body maps that included some degree of anatomical detail; in the present study, the drawings were clothed. In both studies, however, the human figure drawings failed to elicit complete and accurate accounts of touch from most children.

We hypothesize that the children’s poor performance stems, at least in part, from their failure to understand the representational nature of the drawings. Prior research with dolls,
for example, has shown that preschool-age children do not appreciate that a doll can serve as a representation for their own body (DeLoache & Marzolf, 1995). Given this, it is hardly surprising that when asked to use a doll to indicate where they were touched, children under the age of 5 make a large number of errors. By the age of 2½, children can exploit the representational nature of line drawings when they depict the location of objects in the environment (DeLoache & Marzolf, 1992), but the results of the present study suggest that they may find it much more difficult to exploit line drawings when the item represented in the picture is their own body.

In conclusion, the results of the current study provide compelling evidence that 5–6-year-old children cannot use body maps to report bodily touch. In fact, only 2 out of 157 children (Experiments 1 and 2 combined) successfully completed the touch task making no errors of omission and no errors of commission. We acknowledge that the kinds of touches that children experienced in the present study are very different from the kinds of touches that they receive in the course of physical or sexual abuse. Although it is possible that the innocuous nature of our touch task may have contributed to children’s errors of omission, we consider this interpretation unlikely given that children also make large number of omission errors when they are interviewed about experiences that involve genital touching and other invasive procedures (Steward et al., 1996). Furthermore, the innocuous nature of our task does not explain children’s errors of commission, particularly their false claims of touches to their genitals or to their breasts.

On the basis of these findings and those previously reported by Steward et al. (1996), we caution professionals against the use of body maps in clinical and legal interviews with children of this age. Whether older children can use body maps or whether younger children can use other forms of representation (e.g., photographs of themselves) to accurately report where they have been touched is not known. We are currently exploring these possibilities.

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