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# Children's Underextended Understanding of *Touch*

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Children screened for sexual abuse are typically asked about *touch*, but their understanding of the meaning of *touch* has received little direct study. We asked 4- to 9-year-old children ( $N = 122$ ;  $M = 6.00$ ,  $SD = 1.49$ ; 43% male) Yes-No questions ("Is the boy/girl touching the girl/boy?"/"Are the boy and girl touching?") or Invitations ("What's happening in this picture?") when shown drawings depicting different types of touch: Manual (i.e., with the hand), Nonmanual (i.e., with other body part), Object, and No Touch. In addition to eliciting a greater number of false alarms, Yes-No questions elicited elevated rates of false "no" responses to Object Touch and Nonmanual Touch, without eliciting more true reports of touch than Invitations. Although children's definitions of *touch* became less restrictive with age, even 9-year-old children's understanding of *touch* often excluded Object Touch, especially when queried through Yes-No questions.

**Keywords:** child sexual abuse, children's underextension, children's understanding of *touch*, object touch, question type

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Children are often questioned by professionals in investigations of child sexual abuse to obtain information about experienced bodily contact. To describe different forms of physical contact, interviewers

and children commonly use the word *touch* (Teoh et al., 2014). In addition, interviewers often use *touch* to introduce the abuse topic when asking screening questions. Researchers studying children's reports of experienced touch have observed children often deny touch (Bruck, 2009; Quas & Schaaf, 2002; Sullivan et al., 2022), and surmise this could be partially attributable to children having underextended definitions of *touch*. Children may initially understand *touch* as referring only to manual touch, thus excluding nonmanual touch and touching with an object. However, only one study has directly examined children's understanding of the word, and it was limited in several respects (Hashima et al., 1988). Failing to accurately describe an experienced touch can have important implications when children are questioned about potential abuse.

In the current study, we assessed 4- to 9-year-old children's definitions of *touch* by examining the frequency with which children reported touch in response to four types of Touch Vignettes: Manual Touch, Nonmanual Touch (i.e., other body part), Object Touch, and No Touch. We compared children's responses to Yes-No questions directly asking about touching ("Is the boy/girl touching the girl/boy?"/"Are the boy and girl touching?") to Invitations ("What is happening in this picture?"). Although Yes-No questions typically arouse concerns about false reports of touch, a less frequently addressed concern is that Yes-No questions may increase the likelihood of false denials. In the current study, we not only assessed children's affirmations of touch, but considered when children's answers were inconsistent with touch rather than merely omitting touch. If children respond "no" to a Yes-No question about touching, they are explicitly denying that touching occurred; in other words, their responses are inconsistent with

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Colleen E. Sullivan served as lead for conceptualization, formal analysis, investigation, methodology, project administration, and writing—original draft. Stacia N. Stolzenberg served as lead for supervision, contributed equally to writing—review and editing, and served in a supporting role for conceptualization, investigation, and methodology. Shanna Williams served in a supporting role for conceptualization, methodology, and writing—review and editing. Thomas D. Lyon served as lead for funding acquisition, contributed equally to writing—review and editing, and served in a supporting role for conceptualization and methodology.

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touch. We expected that, compared with Invitations, Yes-No questions would lead to more false reports and more responses that were inconsistent with touch, particularly for younger children. In what follows, we review the evidence that children may have an underextended understanding of *touch*.

### Developing Definitions of Touch

Developmental researchers have observed that young children often *underextend* their definitions of words (Clark, 1995; Dromi, 1987; Jay, 2003). For example, a child learning *dog* underextends the word if she only applies it to the family dog. Children are particularly likely to exclude category members that are atypical (Alexander & Enns, 1988; Johnson & Eilers, 1998). Definitions of *touch* note that it most commonly refers to manual touch and only secondarily to touching with an object or touching with other parts of the body (Oxford University Press, 2022). Hence, children's earliest understanding of *touch* might restrict it to manual touch.

Practice guides for legal and psychological practitioners have recognized this problem. Based on her clinical experience with interviewing young children, Hewitt (1999) suggested that "[s]ome young children may understand touch as something you do only with your finger" (p. 119). In her linguistic perspective on interviewing children written for legal practitioners, Walker (2013) similarly warned that "*touch* may be restricted to human contact with a bare hand" (p. 14). If children believe that only manual touch constitutes touching, this has serious implications for child sexual abuse investigations. Children might deny touching when there was oral-genital, genital-genital, or object-genital contact. Walker (2013) related a case in which the child disclosed touching of the breasts, and when asked by police "Did he touch you anywhere else?" responded "no," but later disclosed genital-genital contact: "the child explained that touching was 'with fingers'" (p. 136). In a field study examining 5- to 12-year-old children questioned about sexual abuse in criminal trials, Sullivan et al. (2022) found that questions about *touch* accounted for 18% of miscommunications, that is, exchanges in which children were inconsistent, uninformative, or insufficiently detailed.

### Direct Tests of Children's Understanding of Touch

Given the ubiquitousness with which children are asked about touching in child sexual abuse cases, we were surprised to find only one study that directly examined children's definitions of *touch* (Hashima et al., 1988). Hashima et al. (1988) asked 3- and 4-year-old children to sort pictures into a "touching" box or a "not touching" box, and explain (or correct) their incorrect classifications. The pictures depicted manual touch, touch with a washcloth, touch with the mouth, and no touch. The researchers found some support for underextension: 29% of children denied that touching with the mouth constituted touch. Although 14% of children denied that touching with a washcloth was touch, 11% also denied that manual touching was touch, and the two percentages were not significantly different. Only 3% of children false alarmed to pictures depicting no touch.

Hashima and colleagues' (1988) study is limited in several respects. First, the task may have misestimated children's understanding. The sorting task may have been difficult, as children had to keep the objective of the task in mind (i.e., correctly sorting the pictures into "touching" or "not touching" boxes) while reviewing each vignette. Children may be better able to simply affirm or

negate whether individual vignettes constitute touch. On the other hand, because only incorrect choices were probed in the follow-up questions, children may have perceived the questions as challenging their responses, and this may have led them to change their answers with little thought, thus exaggerating accuracy. Unfortunately, the researchers did not report how often children erred in sorting and how often they corrected their initial response. Second, the vignettes presented limited types of object touch and nonmanual touch. Children may perceive touching with a washcloth as touch (because one can feel through the cloth, as with a glove) but not perceive touching with other objects as touch. Similarly, how children perceive touching with body parts other than the mouth is unknown. Third, because the study compared 3- and 4-year-olds to adults, age differences in children's understanding could not be explored.

### Studies Examining Children's Reports of Experienced Touch

At first glance, laboratory studies examining children's reports of experienced touch might provide evidence of children's understanding, since they routinely ask children questions with the word *touch* (Brown et al., 2007, 2012; Bruck, 2009; Bruck et al., 1995, 2000, 2016; Poole & Dickinson, 2011; Quas & Schaaf, 2002; Saywitz et al., 1991; Steward et al., 1996). Indeed, several studies commented on children's potentially limited understanding of the word and how this might have led children to falsely deny touch (Brown et al., 2007, 2012; Bruck, 2009; Quas & Schaaf, 2002). However, for several reasons their results fail to address the question of whether children's definition of *touch* excludes nonmanual or object touch.

First, most or all of the experimental touches were manual, and even when they included nonmanual or object touch, the analyses of children's reports of touching failed to distinguish between manual and other types of touching. Second, children's failure to report experienced touch could be attributable to a lack of encoding, forgetting, insufficient cuing, and embarrassment or reluctance rather than an underextended definition. Third, in the few studies in which researchers attempted to directly address children's understanding of the word *touch* (Brown et al., 2012; Bruck, 2009), their analyses did not consider nonmanual and object touch.

In Bruck's (2009) study, 3- to 7-year-old children participated in a magic show that involved touching of the child by the magician and the magician by the child on various parts of the body (e.g., wrist, ear, head), sometimes manually and sometimes with an object (e.g., a wand, a sticker). Children were questioned immediately after, first with recall questions and then with Yes-No questions directly asking about touching. If a child failed to disclose touch, the interviewer asked additional questions designed to remind the child of the touching, and then asked again whether touching had occurred, ultimately asking "Why did you not tell me about the touching before?" Bruck (2009) found that among children who persistently denied touching, 10% to 25% of their responses reflected a belief that the action was not "touching," with the highest percentage among 5-year-olds.

Bruck's (2009) study clearly supports the proposition that some children have an underextended understanding of *touch*, but leaves several issues unresolved. Children who had denied touching also sometimes reported that a different body part was involved, that the action had not occurred, or that they had forgotten to report the

action, and these children's understanding of *touch* was not directly assessed. Hence, the age differences and percentages failed to fully capture differences in children's definitional understanding. Second, even among children who acknowledged touch but then denied that it constituted touching, one cannot determine the reason for their underextension of *touch*. Bruck (2009) did not report whether those children were referring to object touch or manual touch, and in fact suggested underextension might occur for an entirely different reason: Children might characterize some types of touch with a more specific word, such as *rub*.

Brown et al. (2012) addressed a similar issue: Whether children might deny touch when a more specific word was available (see also Walker, 2013). A photographer dressed 5- to 7-year-old children in a pirate costume and touched the children on their feet, ear, wrist, waist, and shoulder. Children were questioned twice after a delay, first with recall questions and then with Yes-No questions directly asking about the touch. If a child failed to disclose touch, they were asked "Did the photographer *tickle* your feet?" This failed to elicit new reports. The researchers concluded that children's failure to report touch was attributable to memory failure and not to an underextended definition of touch, in which the availability of a more specific term led children to deny touching. However, the study could not determine whether children perceive nonmanual and object touch as touch.

### Recall Versus Recognition

In exploring children's definition of *touch*, it is important to compare children's responses to recall questions and recognition questions. A recurrent theme in the research on children's reports of experienced touch is that children underreport touching in response to recall questions (such as "Tell me as much as you can about the magic show"), which leads to arguments about the utility of dolls, drawings, and Yes-No questions directly asking whether touching occurred (see reviews in Poole et al., 2011; Poole & Bruck, 2012). An often overlooked issue is that when children fail to report touching in response to recall questions, they tend to *omit* reports of touch, whereas when children fail to report touching in response to recognition questions, they overtly *deny* touching. If a child is asked a recall question about an interaction and does not mention touch, their response may simply omit touch (e.g., "We played together"), and thus not be inconsistent with touch. The child's response to subsequent recall questions ("Tell me everything that happened when you played") may elicit explicit reports of touch or descriptions of actions in which touching must have occurred (Bruck et al., 2016). In contrast, children's omissions of touch reports in response to recognition questions will be inconsistent with touch, because they will give "no" responses. Children largely answer Yes-No questions "yes" or "no" without elaboration and rarely answer "I do not know" or seek clarification (Stolzenberg & Lyon, 2014). In the investigation of sexual abuse, a failure to disclose touching has different practical implications than an overt denial, because researchers generally agree that children delay disclosing sexual abuse, but there is disagreement over the likelihood that children deny sexual abuse when directly questioned (London et al., 2020; Lyon et al., 2020).

In the only study to date directly examining children's understanding of *touch* (Hashima et al., 1988), the researchers did not examine how children responded to broad recall questions

(invitations) about the scenarios to determine whether children would spontaneously describe touch, or spontaneously provide descriptions that were inconsistent with touch. The researchers initially asked children to describe what the characters were doing but did not score children's answers.

### The Present Study

We presented 4- to 9-year-old children with 24 Touch Vignettes: six Manual Touch Vignettes, six Nonmanual Touch Vignettes, six Object Touch Vignettes, and six No Touch Vignettes. We compared children's responses to Yes-No questions about touching ("Is the boy/girl touching the girl/boy?"/"Are the boy and girl touching?") to Invitations ("What is happening in this picture?"), both assessing whether children reported touching and whether their responses were inconsistent with touch. We hypothesized that: (a) Children would report Non-Manual and Object Touch as touching less often than Manual Touch, and this difference would be most pronounced among the younger children; (b) Yes-No questions would lead to more false reports of touch (in response to the No Touch Vignettes) than Invitations; (c) Yes-No questions would lead to more responses inconsistent with touch than Invitations.

### Method

#### Sample

Participants included 122 four- to 9-year-old children ( $M = 6.00$ ,  $SD = 1.49$ , 43% male). The age range was selected to overlap with prior research examining children's understanding of *touch* (Hashima et al., 1988: 3- and 4-year-olds) and children's reporting of experienced touch (e.g., Bruck, 2009: 3- to 7-year-olds), excluding 3-year-olds because of their difficulty in responding to invitations (Hershkowitz et al., 2012), and including older children (8- and 9-year-olds) in anticipation of identifying a group at ceiling. Children in the sample were 59% White; 19% Hispanic; 6% Black; 4% Indian; 2% or less Arabian, Asian, Dutch, Indonesian, Irish, Portuguese, Serbian, Slovakian, Taiwanese, and Turkish; and predominantly middle to upper class (42% had an annual income of \$100,000 or more; 16% \$60,000 to \$99,999; 9% \$40,000 to \$59,999; 7% \$20,000 to \$39,999; and 6% \$15,000 or less). Children predominantly learned English as their first language (76% of children) and 80% of children spoke English at home; all children were English fluent. All participants were patrons of a local children's museum.

#### Material and Procedure

Interviewers set up an exhibit at a local children's museum where children could participate in the experiment if they and their families expressed interest. The exhibit described the study as, "How do children understand the concept of touch?" Once they expressed interest, the interviewer obtained assent from the child, informing them that they could stop at any time. Next, the interviewer asked the child's parent or guardian to sign a consent form and provide demographic information. Parents were invited to take an information sheet with them, which included a description of the study and contact information for the principal investigator. The protocol was approved by the Internal Review Board (IRB) at Arizona State University.



The interviewer presented 24 vignettes, with each vignette showing a boy and a girl interacting, and in some instances, touching (six Manual Touch Vignettes, six Nonmanual Touch Vignettes, six Object Touch Vignettes, and six No Touch Vignettes; for pictures see the [online supplemental materials](#)). The order of presentation was fully counterbalanced. At the presentation of each vignette, the interviewer started by pointing to each figure in the vignette and stating, "This is the boy, and this is the girl." Children were then asked questions about the nature of touching. These questions varied based on the condition each child was assigned to.

Children were randomly assigned, between-subjects, to a Question Type. Children in the Yes-No condition ( $N = 60$ ) were asked 3 questions per vignette: (a) "Is the boy touching the girl?"; (b) "Is the girl touching the boy?"; (c) "Are the boy and the girl touching?" Children in the Invitation condition ( $N = 62$ ) were asked, "What's happening in this picture?" The entire procedure lasted approximately 5 minutes. Each interview was video recorded, and all video recordings were kept in a secure location.

### Transcription and Coding

Statements by the child and interviewer were transcribed and coded by trained research assistants. Children's responses were coded for whether the child reported touch and provided responses that were inconsistent with touch.

### Reported Touch

Children's responses were coded dichotomously if they reported touch (0 = did not report touch, 1 = reported touch). For the Yes-No condition, if children responded "yes" to at least one question (out of the three: "boy touching the girl;" "girl touching the boy;" "boy and girl touching") they were considered to have reported touch. In response to the Invitations ("What is happening?"), children could use the word *touch* or a synonym for touch (i.e., poke, hit, grab, hold). We created a composite score for each child within each Touch condition (e.g., a child who reported touch in response to 5 out of 6 Manual Touch Vignettes would receive a score of .83 for the Manual Touch condition).

### Inconsistent With Touch

Children's responses were coded dichotomously if they were inconsistent with touch (0 = not inconsistent with touch; 1 = inconsistent with touch). For the Yes-No condition, children's responses were coded as inconsistent with touch if they responded "no" to all three Yes-No questions. For the Invitation condition, children's responses were coded as inconsistent with touch if they included descriptions of an action or interaction that was distinct from touch and did not carry the potential of touching. For example, if a child responded, "They're thinking" this was considered inconsistent with touch. Conversely, if a child responded, "They're playing a game together" this was considered not inconsistent with touch because playing a game together carried the potential that the two children were touching. We created a composite score for each child within each Touch condition.

### Reliability

Two coders were trained on the coding guide. Coders independently coded 20% of the sample and reached a minimum reliability of  $\kappa = .80$  on each variable.

## Preregistration and Data Sharing

This study's design was not preregistered. Data and analysis code are available through this link: <https://doi.org/10.17605/OSF.IO/QKWXU>

## Results

### Responses Reporting Touch

Descriptively, children reported touch most often in response to Manual Touch (90% in Yes-No condition, 85% in Invitation condition) and Nonmanual Touch (79% Yes-No; 78% Invitation) Vignettes, less often in response to Object Touch Vignettes (54% Yes-No; 65% Invitation), and infrequently reported touch in response to No Touch Vignettes (14% Yes-No; .57% Invitation). We first examined the Touch Vignettes depicting touch, and then examined the No Touch Vignettes.

### Touch Vignettes Depicting Touch

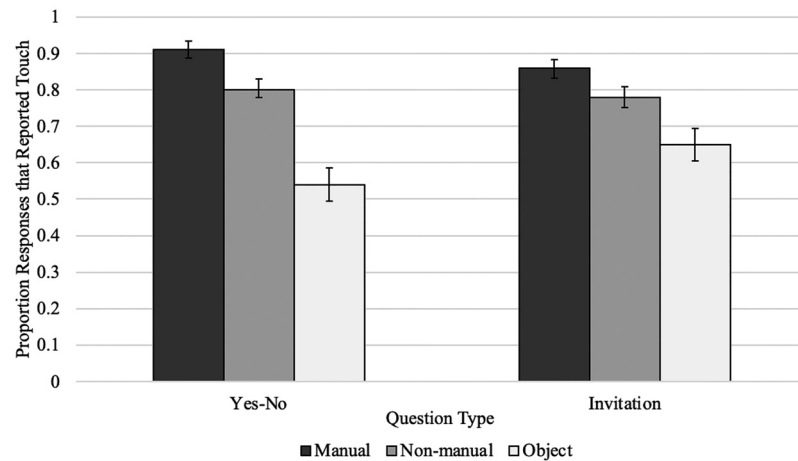
To examine whether Touch Vignette, Question Type, and Age influenced children's touch reports, we conducted a 3 Touch Vignette (Manual, Nonmanual, Object)  $\times$  2 Question Type (Yes-No, Invitation)  $\times$  Age (in months) ANOVA on the proportion of children's responses that reported touch, with Touch Vignette as a within-subjects factor, and Question Type and Age as between-subjects factors. There was a significant main effect of Touch Vignette,  $F(2, 236) = 3.26, p = .04, \eta_p^2 = .03$ . The main effects for Question Type,  $F(1, 118) = .24, p = .624, \eta_p^2 = .002$ , and Age were not significant  $F(1, 118) = .77, p = .382, \eta_p^2 = .01$ . The main effect for Touch Vignette was qualified by a significant interaction between Touch Vignette and Question Type,  $F(2, 236) = 4.77, p = .009, \eta_p^2 = .04$ , and a significant interaction between Touch Vignette and Age  $F(2, 236) = 3.51, p = .032, \eta_p^2 = .03$ .

The interaction between Touch Vignette and Question Type is depicted in [Figure 1](#). In both the Yes-No and Invitation conditions, the effect of Touch Vignette was significant, but Touch Vignette differences were more pronounced when children were asked Yes-No questions (Yes-No:  $F[2, 116] = 28.53, p < .001, \eta_p^2 = .33$ ; Invitation:  $F[2, 122] = 21.60, p < .001, \eta_p^2 = .26$ ). Children reported touch significantly more often in response to Manual Touch Vignettes, compared with Nonmanual (Yes-No:  $M_{diff} = .11, SE = .03, p < .001, 95\% CI [.05, .18]$ ; Invitation:  $M_{diff} = .07, SE = .03, p = .024, 95\% CI [.01, .14]$ ) and Object Touch Vignettes (Yes-No:  $M_{diff} = .37, SE = .06, p < .001, 95\% CI [.23, .51]$ ; Invitation:  $M_{diff} = .20, SE = .04, p < .001, 95\% CI [.12, .29]$ ), and significantly more often in response to Nonmanual Touch Vignettes compared with Object Touch Vignettes (Yes-No:  $M_{diff} = .26, SE = .06, p < .001, 95\% CI [.10, .41]$ ; Invitation:  $M_{diff} = .13, SE = .03, p < .001, 95\% CI [.05, .21]$ ).

To examine the interaction between Touch Vignette and Age, we created three Age Groups (4- to 5-year-olds, 6- to 7-year-olds, and 8- to 9-year-olds; see [Figure 2](#)). Across Age Groups, the effect of Touch Vignette was significant (4- to 5-year-olds:  $F[2, 98] = 16.59, p < .001, \eta_p^2 = .25$ ; 6- to 7-year-olds:  $F[2, 96] = 17.83, p < .001, \eta_p^2 = .27$ ; 8- to 9-year-olds:  $F[2, 42] = 19.04, p < .001, \eta_p^2 = .48$ ). Children endorsed touch in response to the Manual Touch Vignettes at near-ceiling levels, and less often endorsed touch in response to the Object Touch Vignettes (4- to 5-year-olds:  $M_{diff} = .25, SE = .05, p < .001, 95\% CI [.13, .37]$ ; 6- to 7-year-olds:  $M_{diff} = .28,$

**Figure 1**

*Proportion of Children's Responses That Reported Touch: Touch Vignette × Question Type Interaction*



*Note.* Error bars represent standard errors.

$SE = .05$ ,  $p < .001$ , 95% CI [.15, .41]; 8- to 9-year-olds:  $M_{diff} = .38$ ,  $SE = .09$ ,  $p = .001$ , 95% CI [.15, .61]). Even the oldest children often failed to endorse touch in response to the Object Touch Vignettes. In contrast, although the younger children sometimes failed to endorse touch in response to the Nonmanual Touch Vignettes (compared with Manual Touch, 4- to 5-year-olds:  $M_{diff} = .14$ ,  $SE = .03$ ,  $p < .001$ , 95% CI [.06, .22]; 6- to 7-year-olds:  $M_{diff} = .09$ ,  $SE = .03$ ,  $p = .004$ , 95% CI [.02, .15]), the 8- to 9-year-olds were near ceiling in endorsing touch in the Nonmanual Touch Vignettes, and did so as often as they endorsed touch in response to the Manual Touch Vignettes ( $M_{diff} = .00$ ,  $SE = .03$ ,  $p = .999$ , 95% CI [-.08, .08]).

### **Touch Vignettes Depicting No Touch**

We conducted a Question Type (Yes-No, Invitation) × Age (in months) ANOVA on the proportion of children's responses that reported touch in response to the No Touch Vignettes. Question

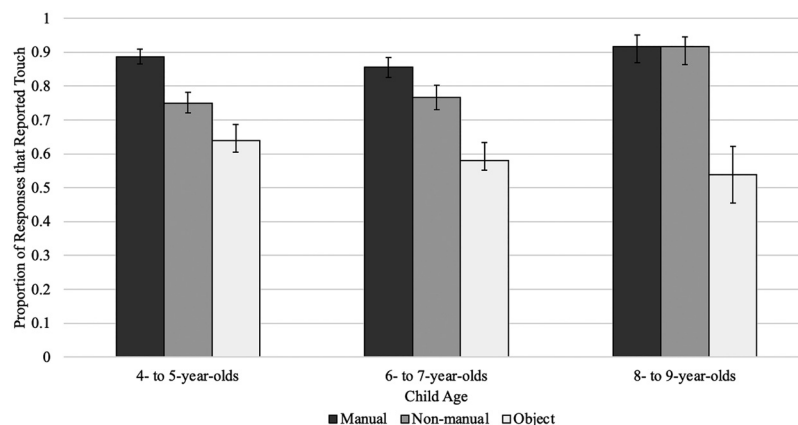
Type significantly influenced children's rates of false reports  $F(1, 117) = 4.13$ ,  $p = .044$ ,  $\eta_p^2 = .03$ . There was no significant effect of Age  $F(1, 117) = .75$ ,  $p = .389$ ,  $\eta_p^2 = .01$ , and Question Type did not interact with Age  $F(1, 117) = .89$ ,  $p = .347$ ,  $\eta_p^2 = .01$ . Yes-No questions led to more false touch reports (14%) compared with Invitation questions (.57%). Descriptively, 20% of the 4- to 5-year-olds false alarmed to at least one of the three Yes-No questions, 11% of the 6- to 7-year-olds, and 8% of the 8- to 9-year-olds.

### **Responses Inconsistent With Touch**

Descriptively, children's responses were inconsistent with touch least often in response to the Manual Touch Vignettes (9% Yes-No, 5% Invitation), more often in response to the Nonmanual Touch Vignettes (21% Yes-No, 10% Invitation), more often in response to the Object Touch Vignettes (46% Yes-No, 12%

**Figure 2**

*Proportion of Children's Responses That Reported Touch: Touch Vignette × Age Interaction*



*Note.* Error bars represent standard errors.

Invitation), and most often in response to the No Touch Vignettes (92% Yes-No, 67% Invitation).

### Touch Vignettes Depicting Touch

We conducted a 3 Touch Vignette (Manual, Nonmanual, Object)  $\times$  2 Question Type (Yes-No, Invitation)  $\times$  Age (in months) ANOVA on the proportion of children's responses that were inconsistent with touch. Neither Touch Vignette,  $F(2, 236) = 2.24$ ,  $p = .109$ ,  $\eta_p^2 = .02$ , nor Age was significant,  $F(1, 118) = .42$ ,  $p = .518$ ,  $\eta_p^2 = .004$ . However, there was a significant main effect of Question Type,  $F(1, 118) = 41.09$ ,  $p < .001$ ,  $\eta_p^2 = .26$ , and there were significant interactions between Touch Vignette and Question Type,  $F(2, 236) = 18.25$ ,  $p < .001$ ,  $\eta_p^2 = .13$ , and between Touch Vignette and Age,  $F(2, 236) = 5.15$ ,  $p = .006$ ,  $\eta_p^2 = .04$ .

The interaction between Touch Vignette and Question Type is depicted in Figure 3. Whereas Question Type did not significantly influence children's responses to Manual Touch Vignettes,  $F(1, 119) = 3.77$ ,  $p = .054$ ,  $\eta_p^2 = .031$ , children were significantly more likely to provide responses inconsistent with touch when asked Yes-No questions about Nonmanual Touch Vignettes,  $F(1, 119) = 10.97$ ,  $p = .001$ ,  $\eta_p^2 = .08$  (21% Yes-No, 10% Invitation), and Object Touch Vignettes,  $F(1, 118) = 36.83$ ,  $p < .001$ ,  $\eta_p^2 = .24$  (46% Yes-No, 12% Invitation).

The interaction between Touch Vignette and Age is depicted in Figure 4. Across Age Groups, the effect of Touch Vignette was significant (4- to 5-year-olds:  $F[2, 98] = 7.16$ ,  $p = .001$ ,  $\eta_p^2 = .13$ ; 6- to 7-year-olds:  $F[2, 96] = 12.98$ ,  $p < .001$ ,  $\eta_p^2 = .21$ ; 8- to 9-year-olds:  $F[2, 42] = 12.93$ ,  $p < .001$ ,  $\eta_p^2 = .38$ ). Children rarely gave responses that were inconsistent with touch in response to Manual Touch Vignettes and most often gave responses that were inconsistent with touch in response to Object Touch Vignettes (4- to 5-year-olds:  $M_{diff} = -.14$ ,  $SE = .04$ ,  $p = .005$ , 95% CI  $[-.25, -.04]$ ; 6- to 7-year-olds:  $M_{diff} = -.24$ ,  $SE = .05$ ,  $p < .001$ , 95% CI  $[-.36, -.11]$ ; 8- to 9-year-olds:  $M_{diff} = -.34$ ,  $SE = .09$ ,  $p = .004$ , 95% CI  $[-.58, -.10]$ ). The two younger Age Groups gave responses that were inconsistent with touch significantly less often in

response to Manual Touch Vignettes than Nonmanual Touch Vignettes (4- to 5-year-olds:  $M_{diff} = -.10$ ,  $SE = .03$ ,  $p < .001$ , 95% CI  $[-.16, -.04]$ ; 6- to 7-year-olds:  $M_{diff} = -.08$ ,  $SE = .02$ ,  $p = .004$ , 95% CI  $[-.14, -.02]$ ), whereas the 8- to 9-year-olds gave responses at equally low rates to the Manual and Nonmanual Touch Vignettes ( $M_{diff} = -.03$ ,  $SE = .03$ ,  $p = .772$ , 95% CI  $[-.10, .04]$ ).

### Touch Vignettes Depicting No Touch

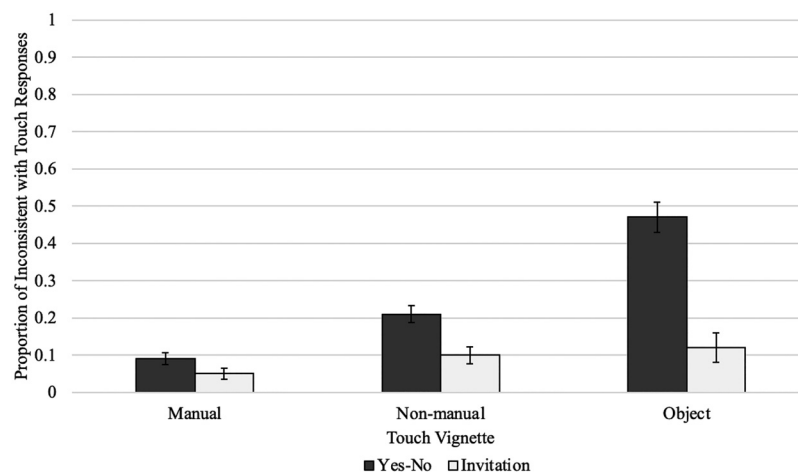
We conducted a Question Type (Yes-No, Invitation)  $\times$  Age (in months) ANOVA on the proportion of children's responses that were inconsistent with touch in response to the No Touch Vignettes. The main effect of Question Type was significant  $F(1, 118) = 7.01$ ,  $p = .009$ ,  $\eta_p^2 = .06$ , but Age was not,  $F(1, 118) = 1.21$ ,  $p = .273$ ,  $\eta_p^2 = .01$ , and there was no significant interaction between Question Type and Age,  $F(1, 118) = .74$ ,  $p = .393$ ,  $\eta_p^2 = .01$ . Children gave responses that were inconsistent with touch significantly more often when asked Yes-No questions (91%) than when asked Invitations (67%).

### Item Analyses

Because children viewed six vignettes in each of the four Touch conditions, it is possible that they interpreted individual vignettes differently than others in the same group, either selectively failing to endorse touch in one or more of the Touch vignettes (Manual Touch, Nonmanual Touch, or Object Touch) or selectively endorsing touch in one or more of the No Touch vignettes. Therefore, we conducted exploratory item analyses in which we compared each vignette to the average endorsement rate of the five other touch vignettes within that Touch condition to identify any possible anomalies.

A series of  $t$  tests revealed that none of the Manual Touch or Object Touch Vignettes were significantly different than the others. For the Nonmanual Touch Vignettes, children reported touch significantly less often in response to the vignette of the boy and the girl touching their elbows together (71%,  $M = .71$ ,  $SD = .45$ ) compared with the other Nonmanual Touch vignettes (86%,  $M = .86$ ,

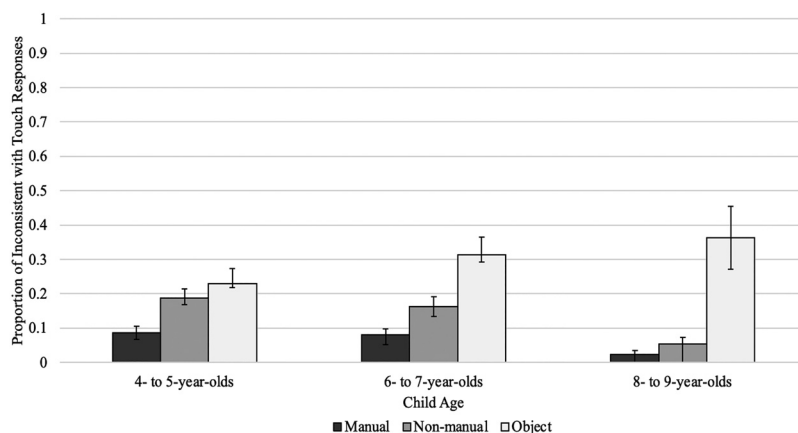
**Figure 3**  
Proportion of Children's Responses That Were Inconsistent With Touch: Touch Vignette  $\times$  Question Type Interaction



Note. Error bars represent standard errors.

**Figure 4**

*Proportion of Children's Responses That Were Inconsistent With Touch: Touch Vignette × Age Interaction*



*Note.* Error bars represent standard errors.

$SD = .21$ ),  $t(121) = -3.59$ ,  $p < .001$ ;  $d = .45$ . Descriptively, 64% of the 4- to 5-year-olds and 68% of the 6- to 7-year-olds described touching, compared with 95% of the 8- to 9-year-olds. For No Touch, children reported touch significantly more often in response to the vignette of the boy and the girl sharing a book (19%,  $M = .19$ ,  $SD = .39$ ) compared with the other No Touch vignettes (5%,  $M = .05$ ,  $SD = .15$ ),  $t(121) = 3.91$ ,  $p < .001$ ;  $d = .49$ . We elaborate on the possible interpretation of these differences in the Discussion.

### Exploratory Analyses of Invitations: Children's Reference to "Touch With" and Descriptions of Touching Without the Word *Touch*

During coding of children's responses to the Invitations, we noticed two interesting patterns. First, children reporting touch in response to the Object Touch Vignettes often used the phrase *touch with*, naming both the agent and the object. We suspected that this tendency increased with age, such that the older children were more likely to discriminate between *touch* and *touch with*. We conducted an ANOVA with Age in months as a between-subjects factor and the proportion of responses using the words "touch with" as the dependent variable. The effect of Age was significant,  $F(1, 59) = 8.09$ ,  $p = .006$ ,  $\eta_p^2 = .12$ . Descriptively, the 8- to 9-year-olds used the term "touch with" in 22% of their responses reporting touch, compared with 15% of the 6- to 7-year-olds ( $M_{diff} = .09$ ,  $SE = .05$ ,  $p = .253$ , 95% CI  $[-.04, .22]$ ) and 8% of the 4- to 5-year-olds ( $M_{diff} = .16$ ,  $SE = .05$ ,  $p = .009$ , 95% CI  $[-.03, .29]$ ).

Second, children reporting touch in response to Invitations routinely failed to use the word *touch*. They failed to explicitly mention *touch* in response to 61% of the Manual Touch Vignettes (e.g., *poking*, *pushing*), 78% of the Non-Manual Touch Vignettes (e.g., *kicking*, *kissing*), and 72% of the Object Touch Vignettes (e.g., *hitting*, *poking*). We conducted an ANOVA with Touch Vignette (Manual, Nonmanual, Object) as a within-subjects factor and Age (in months) as a between-subjects factor. The main effect of Touch Vignette was significant,  $F(2, 122) = 3.53$ ,  $p = .032$ ,  $\eta_p^2 = .06$ , but Age was not  $F(1, 61) = .15$ ,  $p = .701$ ,  $\eta_p^2 = .002$ , and there was no

significant interaction,  $F(2, 122) = 2.31$ ,  $p = .104$ ,  $\eta_p^2 = .04$ . Children used the word *touch* significantly more often in response to Manual Touch Vignettes than Nonmanual Touch ( $M_{diff} = .17$ ,  $SE = .03$ ,  $p < .001$ , 95% CI  $[-.09, .25]$ ) and Object Touch Vignettes ( $M_{diff} = .11$ ,  $SE = .04$ ,  $p = .013$ , 95% CI  $[-.02, .20]$ ), and the latter two did not differ ( $M_{diff} = .06$ ,  $SE = .04$ ,  $p = .232$ , 95% CI  $[-.15, .15]$ ). As with the item analyses, we will discuss implications of these findings in the Discussion.

### Discussion

We examined the frequency with which 4- to 9-year-olds reported touch in response to Yes-No questions ("Is the boy touching the girl?" "Is the girl touching the boy?" "Are the boy and the girl touching?") or Invitations ("What is happening in this picture?") across four Vignettes: Manual Touch (touching with the hand), Nonmanual Touch (touching with another body part), Object Touch (touching with an object), and No Touch. We hypothesized that children would endorse Nonmanual Touch and Object Touch as touching less often than Manual Touch, and this hypothesis was supported. We expected that this difference would be most pronounced with younger children, and although this hypothesis was supported with respect to Nonmanual Touch, even the oldest children (8- to 9-year-olds) often failed to endorse touching when presented with Object Touch Vignettes.

Furthermore, we hypothesized that Yes-No questions would lead to more false reports of touch than Invitations in response to the No Touch Vignettes, and this hypothesis was also confirmed. Finally, we hypothesized that Yes-No questions would lead to more responses that were inconsistent with touch than Invitations, such that the response clearly indicated that touch had not occurred, and this hypothesis was supported. Children's failures to report touch in response to Yes-No questions constituted overt denials (since they almost always simply answered "no"), whereas children's failures to report touch in response to Invitations more often omitted whether touch had occurred. Across the different vignettes, Yes-No questions failed to elicit more true reports and elicited more false reports than Invitations.



The only advantage of Yes-No questions is that they led to clearer denials of touching when no touching was depicted. In what follows, we discuss the findings in light of previous research and our exploratory analyses, note limitations and suggest future directions, and conclude with implications for practice.

### Touch Definitions: Beyond Manual Touch

The youngest children were near ceiling in identifying manual touch as *touch*. Children up to 9 years of age often failed to report touch with an object as touching, and children up to 7 years of age were less likely to view nonmanual touch as touching than touch with the hand. The notion that children initially understand *touch* as manual touch is consistent with the advice of practitioners (Hewitt, 1999; Walker, 2013) and broadly consistent with the single prior study examining children's understanding of *touch* (Hashima et al., 1988).

What was most striking was how often the oldest children denied that touching with an object constituted *touch*. We found an age increase in the likelihood that children who described touching in response to the Invitations used the term *touch with*. This may help explain why the oldest children continued to deny touching when asked about Object Touch in the Yes-No condition. Although adults would (we suspect) subsume *touch with* under *touch*, children may treat them as distinct.

With respect to Hashima et al. (1988), although children were most inclined to characterize touching with the hand as *touch*, the percentage characterizing touching with an object as touch was nonsignificantly lower. However, the only object tested in the paradigm used by Hashima et al. (1988) was a washcloth. Children may have viewed this as an example of manual touch, since one touches *through* the cloth as much as *with* the cloth (cf. touching with a gloved hand). Furthermore, children's correct endorsement of touch may have been exaggerated in Hashima et al. (1988), because the researchers selectively inquired into children's initially incorrect responses, allowing children to change their response.

A closer look at our findings with respect to nonmanual touching complicates the picture. Exploratory analyses of the individual Non-manual Touch vignettes suggested that younger children's disinclination to characterize elbow-to-elbow touching as *touch* influenced the age effects. Elbow-to-elbow touching is both noncanonical and often unintentional, and this may have influenced younger children's responses. Conversely, manual touching is not only typical, but also intentional. Hence, children may initially view *touch* as both manual and intentional, and only gradually recognize that it involves any type of physical contact. Indeed, the Oxford English Dictionary gave intentional contact priority over contact in general in its definition of *touch* (Oxford University Press, 2022). In practical terms, this suggests an additional problem: young children may deny abusive touch when it is disguised as unintentional (such as frotteurism, or abuse that occurs in the course of roughhousing or play).

Hashima et al. (1988) found that children were significantly less inclined to endorse kissing as touching than manual touch, and this supports the notion that children initially limit their understanding of *touch* to manual touch. However, because kissing is a distinctive act, and *kiss* is an early acquired word, children's failure to endorse kissing as touching might reflect a different kind of underextension, in which the availability of a more specific term for an action leads children to reject the word *touch* (Brown et al., 2012; Bruck, 2009; Walker, 2013).

At this point, although there is anecdotal support for this claim (Walker, 2013; with respect to *wash*), it has not received research support (Brown et al., 2012; with respect to *tickle*). Bruck's (2009) evidence of underextension is ambiguous, because she failed to distinguish between denials of touch when objects were and were not involved. Our results also fail to provide support for this claim. In response to the Invitations, children who described touching usually did so without using the word *touch*, most often when describing nonmanual and object touch. This clearly shows that children have more specific terms available for describing touching, and those terms may be more available when describing non-manual and object touch. However, we found no evidence that this led children to reject *touch* in the Yes-No condition. That is, children were no less likely to endorse touch in the Yes-No condition than in the Invitations condition. Indeed, in the Manual Touch condition, where children universally endorsed *touch* in the Yes-No condition, they failed to use the word *touch* more than half the time when describing touching in the Invitation condition.

### Influence of Question Type on Touch Reports

Researchers examining children's reports of experienced touch have frequently found that recognition questions (which include Yes-No questions), are more likely than recall questions (which include Invitations) to elicit false alarms (Bruck et al., 1995, 2000; Saywitz et al., 1991). Here, we found the expected increase in false alarms among Yes-No questions when No Touch was depicted. Importantly, we gave children plenty of opportunities to false alarm, because we asked three Yes-No questions and counted any "yes" as an endorsement of touch. Moreover, children most often falsely endorsed *touch* to a vignette in which the boy and girl held the same book, which could have been interpreted as object touch (i.e., the boy touching the girl with the book). Removing this vignette led to a large reduction in children's false alarms (to about 5%). Nevertheless, it remained higher than Invitations, which virtually never elicited false reports of touching.

The argument for asking children recognition questions about touching is that they overcome children's failure to disclose touching in response to recall questions. In actual abuse investigations, this is a legitimate concern, both because recognition questions improve retrieval of difficult to recall information (Ceci & Bruck, 1993), and because recognition questions often elicit disclosures from reluctant children who failed to disclose in response to recall questions (Stolzenberg et al., 2017). However, an often overlooked difficulty with recognition questions is that when they fail to elicit true reports, they elicit overt denials. That is, when children fail to disclose in response to recognition questions, they simply say "no." Consistent with research finding that children tend to give minimally sufficient responses to recognition questions, reticently responding "yes" or "no," (Lyon et al., 2019; Stolzenberg & Lyon, 2017), children asked Yes-No questions elaborated on their responses in only 4% of responses, and those elaborations often failed to provide additional details (e.g., "No, only the boy is touching"). In contrast, when children asked Invitations failed to report touch, they often provided responses that were consistent with touching but simply failed to focus on touch (e.g., "I think they are having a race;" "The boy is holding a teddy bear"). In response to these statements, an interviewer could follow up with additional recall questions about the interaction that might elicit

reports of touching. Once an interviewer resorts to a Yes-No question, however, a "no" response makes persistent questioning potentially coercive.

### Limitations and Future Directions

This study was not designed to assess children's reports of their personal experiences. We showed children drawings and asked them to describe the interactions with the drawings in view. This is quite different from reporting touch in investigative interviews or testimony, in which children are asked about personally experienced touch after a delay. This is a limitation, but also a strength. This study suggests an upper bound for the extent to which children are likely to answer "yes" to Yes-No questions about experienced touch. If children do not characterize some types of touching as *touch* when that touching is clearly presented, they are not going to recall touching as *touch* when questioned in difficult circumstances about stressful experiences. Children's false negatives in experienced touch studies have been attributed to a lack of encoding, forgetting, insufficient cuing, and embarrassment. This study demonstrates that their limited understanding of *touch* provides an additional explanation.

We did not include 2-year-olds or 3-year-olds in our sample. Children this young present special challenges. For example, Fritzley & Lee found that 2-year-olds exhibit a yes-bias in response to Yes-No questions (Fritzley & Lee, 2003; Fritzley et al., 2013). It is possible that had we included younger children, the rate at which children would false alarm to the No Touch Vignettes would be higher. At the same time, children this young are unlikely to appear as witnesses, particularly in the United States, where their difficulty in demonstrating their testimonial competence will prevent them from testifying (Evans & Lyon, 2012; Lyon, 2011).

We did not ask children follow-up questions. Our purpose was to design a brief task providing children with a large and diverse number of vignettes while maintaining their attention and interest. With respect to the Yes-No questions, this meant we failed to ask children to explain their responses. Explanations may have provided added insight into their understanding. Indeed, responding to the Object Touch vignette in which a boy pokes a girl with a teddy bear, a 7-year-old child responded "No - kind of but the teddy bear is touching so no because the teddy bear is not a part of the body." On the other hand, asking a single, simple question for each vignette provided a sensitive measure of young children's understanding. Piaget (1932) learned a great deal about children's thinking by asking them for explanations, but with respect to children's definitional understanding (specifically, the word *lie*), he observed how "difficult it is for the child to give an adequate definition of the notions he uses due to his inability to realize them consciously," and instead recommended "present[ing] to the child a certain number of stories, asking him each time whether a lie has been told or not" (pp. 142–143). With respect to the Invitations, we failed to ask children to elaborate. As noted previously, this left unanswered whether cued invitations (including "You said [child's response]; tell me more about that") would have elicited additional reports of touching. This could have led to underestimation of the sensitivity of Invitations to descriptions of touching.

In the future, researchers could focus on fewer situations so that children are given the opportunity to provide fuller explanations and more complete reports. Furthermore, our observations above regarding previously unexplored aspects of children's understanding raise

clear questions for future research. First, researchers examining experienced touch could include measures of children's understanding of *touch*, particularly if the experienced touching is nonmanual, incidental, and/or object touch, and determine if this helps predict false denials. Second, with respect to the intentionality of touch, researchers could systematically assess children's characterization of incidental or apparently accidental touch, making intentionality overt. Third, with respect to underextension due to the availability of more specific terms, the most sensitive test would compare children's Yes-No responses to vignettes depicting typical interactions either using the specific term (e.g., "Is the boy *kissing* the girl?") or *touch* (e.g., "Is the boy *touching* the girl?"). Fourth, this approach could also be taken with respect to children's understanding of *touch with*. That is, researchers could determine if children who deny *touch* would endorse *touch with*. Finally, research with older children (and if necessary, adults) would be helpful in identifying when and how children develop an understanding of *touch* that encapsulates all forms of physical contact.

### Implications for Practice

This study provides foundational knowledge that can inform legal actors about how children's understanding of *touch* influences their responses to questions about touching. A child may deny touching when directly asked because they were touched with an object or with something other than the perpetrator's hand. This limits the sensitivity of Yes-No questions asking about *touch*. Furthermore, a child may deny they were touched in response to Yes-No questions but later describe an abusive action in their own words. Practitioners should consider whether apparent inconsistencies in children's reports could be attributable to the types of questions they were asked.

If researchers find that children will endorse specific actions that constitute touching even if they fail to use the term *touch*, interviewers might conclude that "using more specific terms such as *rub*, *scratch*, and so forth could produce more information" (Bruck, 2009, p. 371). However, we would be hesitant to recommend such an approach, given the likelihood of false alarms. Although the number of false "yes" responses was quite small, these percentages can only increase if interviewers ask additional questions with alternative terms, both because more questions mean more opportunities for false alarms, and because children may have limited understanding of those terms. Yes-No questions are useful for answering research questions, but they present clear hazards for interviewing practice. At the very least, interviewers who elicit "yes" responses from specific questions should pair their questions with requests for elaboration to reduce error (Stolzenberg et al., 2017). Moving forward, practitioners and researchers must continue to search for means of overcoming children's difficulties in disclosing abusive touch without risking false allegations.

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