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Touch Among Children at Nursery School

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Naturalistic observations of touching behaviors were conducted among 33 preschool children, ranging from 3 to 64 months of age. Touch was coded for direction (received/initiated), type, body area touched, responses to touch, and purpose. Infants received significantly more touch than older children. Preschool children engaged in touching behaviors similar to those observed among adults. Touch involved "vulnerable body parts" more often among toddlers than among preschoolers. 'Negative' responses to being touched occurred more often among toddlers than among preschoolers, and task-related touch occurred less often in the preschool than in the toddler and infant classes.

As human beings we rely heavily on our sense of sight and sound to adapt to our environment. Recent findings have indicated that, from a very early age, tactile stimulation also plays an important role in health and development. For example, extra touch stimulation contributes to the growth of newborns (Field *et al.*, 1986; Ottenbacher *et al.*, 1987), and the newborns who were given extra touch stimulation continued to show better growth and development later in infancy (Field, Scafidi & Schanberg, 1987).

Touch stimulation can likewise facilitate mother-infant interaction. Watt (1990) encouraged mothers of small-for-gestational-age infants to provide their one-month-old infants regular tactile stimulation. The author specifically discussed with mothers the use of front carriers and how to massage their infants. At three months the infants showed more gaze and general interaction behavior. The importance of touch for mother infant interactions is further supported by studies on the stress-alleviating effects of touch during still-face mother-infant interactions (Pelaez-Nogueras, Field, Hossain & Pickens, in press; Stack & Muir, 1990). Infants whose mothers touched them while presenting an unresponsive still-face smiled more, grimaced less, and were more content than infants who were not touched during still-face presentations. These results suggest that touch can elicit positive affect and reduce negative affect

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in the absence of other maternal stimulation. In the case of depressed mothers, who have flat affect and voice intonation, touching their infant serves as a compensatory stimulation.

These studies indicate that the sense of touch is of great importance for early development. However, several questions have received scant or no attention by researchers. For instance, how is touch used by young children in their daily interactions with others?

One study investigated the expression of affection in day care settings, including various forms of active and passive physical contact (Twardosz *et al.*, 1977). More physical contact was observed during free-play and large-group activities than small-group activities and meal times. In another study, naturalistic observations of free-play revealed that boys were touched significantly more than girls and that touch progressively decreased across age with infants receiving more touch than toddlers and toddlers more than preschoolers (Field *et al.*, 1993). Studies such as these provide naturalistic descriptions of touch behaviors among young children. However, they do not address the way young children use touch to communicate.

At least one study has shown that young children and adults have different interpretations of scenes depicting touch (Hashima, Barton & Steward, 1988). For example, preschool children made more errors than adults in categorizing non-manual touch (e.g., kissing) as a form of touch. According to Heins (1988), children are also less inhibited than adults in their use of touch as a form of nonverbal communication, perhaps because they have not yet learned the social rules and taboos regarding touch. However, Heins (1988) does not cite empirical examples of the differences between children's and adults' use of touch. A naturalistic study with adults has shown that the hands, arms, shoulders and upper back, considered by the researchers as non-vulnerable body parts, are touched by persons of varying degrees of acquaintance. The head, neck, torso, lower back, buttocks, legs and feet, considered vulnerable body parts, are usually touched only by intimate relations (Jones & Yarbrough, 1985). Although there are no comparable studies with children, Heins (1988) indicates that such patterns may not be present among children. Thus, additional naturalistic data are needed to determine how children use touch and if child touch patterns differ from those of adults.

The purpose of this research was to determine: (1) where on the body infants, toddlers, and preschoolers touch each other; (2) what kinds of touch are used; (3) what purpose touch serves in the interactions of young children; and (4) how children respond to different kinds of touch.

METHOD

Subjects

Subjects were 33 children ($N = 11$ male) from infant ($N = 9$), toddler ($N = 11$) and preschool ($N = 13$) classrooms and their teachers. The children ranged in age from 3 to 64 months ($M = 29$, SD = 16). The infant nursery included children from

Table 1 Ethnic distribution of subjects by classroom.

	Number of Children Per Classroom		
Ethnicity	*Preschool*	*Toddler*	*Infant*
Black	4	3	2
White	3	2	5
Hispanic	5	3	1
Others	1	3	1
	$N = 13$	$N = 11$	$N = 9$

3- to 18-months of age ($M = 1.09$, SD = 6.0), the toddlers were 19- to 24-months of age ($M = 21.9$, SD = 2.1), and the preschoolers were 36- to 64-months of age ($M = 45.8$, SD = 8.8). All children were from educated, middle-income families of various ethnic backgrounds. The ethnic backgrounds of the children are shown on Table 1.

The classrooms were designed to serve as full-day nurseries and as observational research laboratories. They were equipped with a wide variety of age-appropriate toys, and each of the classrooms featured large climbing/play structures and partitioned special activity areas designed to facilitate fantasy play.

Procedure

Live teacher and child observations were made during free-play time. Three 10 minute observations were conducted on each child and teacher. Subjects were randomly selected for observation each day. Thus, the number of days between observations for each child ($M = 13.5$, SD = 9.0) depended whether he/she was drawn for observation and on his/her attendance. All observations were completed over a period of 90 days.

During each observation a trained experimenter recorded, from a non-intrusive vantage point, each touch involving the target subject. The following categorical variables, each consisting of multiple items, were recorded for each touch occurrence: (a) the interactants; (b) directionality of the touch; (c) type of touch; (d) body area touched; (e) response of the person who was touched; and (f) purpose of the touch. Overlap across some of the categories was expected. In such cases touch episodes were scored according to the situational variables and response to the touch. For example, a hit was scored as a playful rather than an aggressive touch if the receiver responded in a positive manner and reciprocated with a playful touch.

Observational data were collected using a combination 10 sec continuous-interval recording procedure during 10 minute observations. That is, each 10 minute observation period was divided into sixty 10 second intervals. Touch was scored if an episode involving touch occurred at any time during the interval. If a touch episode continued into the next interval, it was scored as a continuous touch across intervals (rather than re-scored in the next interval). This scoring technique provided the exact frequency of touch occurrences.

Observers were trained to record each item according to their operational definitions, which were fairly straightforward and obvious for these simple behaviors. Interobserver agreement training was conducted until observers reached an average of 92 percent agreement across the six categories. Agreement was calculated within each category by dividing the total number of agreements by the total number of agreements plus disagreements. The scores ranged from 100 percent for the category Interactants to 84 percent for the category Body Areas. Scores for Directionality, Type of Touch, Response, and Purpose of touch were 96, 89, 89, and 92 percent respectively.

RESULTS

The percentage of intervals in which each item occurred was calculated for each observation period, for each subject (the number of intervals in which the item occurred was divided by the total number of intervals observed). The resulting percentages were then averaged across observations for each subject, and outlier percentages were corrected. Initial analyses revealed standard deviations greater than the mean for some items. Log transformations yielded similar results. Therefore, the results of analyses on the percentage scores are reported. Child and teacher observations were analyzed separately.

Items within each category were grouped, as shown in Table 2, to reduce the number of variables. The groupings for the areas of the body included non-vulnerable body parts and vulnerable body parts, as used by ones and Yarbrough (1985). The grouped items were then subjected to ANOVAs.

To assess the differences between classrooms, one way ANOVAs were conducted with class as the between groups measure. These analyses revealed several significant effects of 'class' for both child and teacher behaviors (see Tables 3 and 4). *Post hoc* Tukey-HSD analyses were used to identify significant differences between groups.

Children's Touch Behaviors

ANOVAs on the child observations revealed that there was a significant effect of 'class' for the item 'receive' ($F_{2,31} = 3.83$, $p = 0.03$). Infants received more touch than preschoolers. No differences were noted across classrooms for the amount of touch initiated. More 'positive' touch occurred in the infant class than in the preschool class ($F_{2,31} = 3.85$, $p = 0.03$), and the amount of 'negative' touch was lower among infants than among preschoolers ($F_{2,31} = 3.73$, $p = 0.04$).

Analyses of the 'body areas' touched revealed that touch directed to the 'lower-back' area of the body occurred significantly more in the infant than in the toddler or preschooler classes ($F_{2,31} = 5.57$, $p = 0.009$). This was probably due to touch occurring in the process of diapering and carrying infants. In the toddler classroom touch was directed to the 'top-front' area of the body significantly more than in the preschool class ($F_{2,31} = 5.09$, $p = 0.01$). Also, among the children, touch directed to

Table 2 Category groupings of coded items.

Groupings	*Items*
Type of Touch	
Total amount of touch	pat, kiss, bite, stroke, kick, casual, prop, pull, hold, hug, carry, hit, push and tackle
Positive touch	pat, kiss, stroke and hug
Negative touch	bite, hit, push and kick
Neutral touch	casual and touch with a prop
Body Areas	
Top-front	face, torso, arm and hand
Upper-back	back of head and upper back
Lower	abdomen, leg and foot
Non-vulnerable body parts	hands, arms, shoulders and upper back
Vulnerable body parts	head, neck, torso, lower back, buttocks, legs and feet
Responses to Touch	
Responsiveness	touch, verbalize, orient and smile
Non-responsiveness	anger/cry and turn away/leave
Purpose of Touch	
Play-related	play
Task-related	helpful and functional
Affect-related	affection and care
Communication-related	mobilize and emphasize

the 'lower-front' area of the body occurred significantly more in the toddler than in the infant or preschool classes ($F_{2,31} = 7.34$, $p = 0.002$). Finally, the amount of touch involving "vulnerable body parts" was significantly higher in the toddler than in the preschool class ($F_{2,31} = 5.64$, $p = 0.008$). This suggests that toddlers have not yet learned the social norms regarding touch, as discussed by Jones and Yarbrough (1985). However, by preschool age children are showing touching behaviors that are similar to those of adults. Specifically, vulnerable body parts are touched less frequently than non-vulnerable body parts.

Differences were also found for the 'purpose' of touch category. There was less 'task' related touch in the preschool classroom than in either the toddler or infant classes ($F_{2,31} = 7.03$, $p = 0.003$). 'Communication' related touch occurred more often in both the toddler and preschool classrooms than in the infant classroom ($F_{2,31} = 7.69$, $p = 0.002$). This result would be expected since the infants were nonverbal. Finally, there was more 'affection' related touch among toddlers than among infants ($F_{2,31} = 3.96$, $p = 0.03$).

Analyses of the 'response' to touch across classrooms indicated the 'negative' responses were significantly more common in the toddler than the infant classroom ($F_{2,31} = 6.43$, $p = 0.005$). This may be attributable to a higher incidence of touch involving vulnerable-body-parts among the toddlers. There were no differences

Table 3 Means (and SDs) for the percent of intervals in which items occurred for touch during child observations.

Variables	*Infants* *Mean (SD)*	*Toddlers* *Mean (SD)*	*Preschoolers* *Mean (SD)*	$p <$
Direction:				
Initiate	3.96 (3.59)a	8.17 (5.30)a	6.44 (4.58)a	NS
Receive	22.30 (18.15)a	16.60 (9.00)ab	8.92 (6.33)b	0.05
Type of Touch:				
Total touch	21.71 (10.01)a	22.47 (9.94)a	15.83 (7.67)a	NS
Positive touch	11.52 (7.16)a	8.89 (6.11)ab	5.01 (3.42)b	0.05
Negative touch	0.15 (0.23)a	2.17 (0.88)ab	4.67 (6.15)b	0.05
Neutral touch	9.56 (9.22)a	10.69 (8.21)a	5.79 (3.75)a	NS
Body Area Touched:				
Top-front	9.84 (4.97)ab	11.93 (3.26)a	6.98 (3.59)b	0.05
Upper-back	6.85 (9.61)a	4.56 (7.83)a	5.64 (7.77)a	NS
Lower-front	1.60 (1.77)a	8.48 (7.57)b	2.41 (1.29)a	0.01
Lower-back	2.08 (2.61)a	0.20 (0.30)b	0.41 (0.49)b	0.01
Non-vulnerable body parts	12.23 (8.90)a	13.30 (8.48)a	10.26 (7.99)a	NS
Vulnerable body parts	7.80 (5.14)ab	11.80 (7.01)a	4.96 (2.13)b	0.01
Purpose of Touch:				
Task	4.96 (3.34)a	4.88 (1.87)a	1.90 (1.68)b	0.005
Affection	0.00 (0.00)a	0.69 (0.70)b	0.36 (0.60)ab	0.05
Communication	1.00 (1.29)a	3.72 (1.88)b	4.04 (2.24)b	0.005
Play	1.96 (3.09)a	1.47 (0.93)a	2.69 (1.36)a	NS
Response of Touch:				
Positive	7.56 (8.44)a	9.01 (3.32)a	8.18 (5.51)a	NS
Negative	3.78 (3.01)a	10.21 (4.53)b	7.62 (4.23)ab	0.05

Means with different subscripts differ significantly from each other.

between classes on the 'positive' response item. Finally, no gender differences were found for any of the item categories.

A Pearson product moment correlation analysis was conducted on all categories of items. This analysis indicated several correlations. 'Positive' touch was significantly correlated with the 'top-front' ($r = 0.83$, $p = 0.01$), 'upper-back' ($r = 0.92$, $p = 0.001$) and 'lower-front' ($r = 0.76$, $p = 0.03$) areas of the body and with 'non-vulnerable body parts' ($r = 0.92$, $p = 0.001$) as well as 'vulnerable body parts' ($r = 0.90$, $p = 0.002$).

The items in the category of 'purpose of touch' were not significantly correlated with any of the body areas touched nor with 'responses' to touch items. 'Task-related' purpose correlated significantly with 'negative' touch ($r = 0.82$, $p = 0.01$), and 'affection-related' purpose was correlated with 'neutral' touch ($r = 0.80$, $p = 0.02$). Touch occurring during communication was correlated with 'negative' touch ($r = 0.74$, $p = 0.04$).

Table 4 Means (SDs) for touch during teacher observations.

Variables	*Infants* *Mean (SD)*	*Toddlers* *Mean (SD)*	*Preschoolers* *Mean (SD)*	*p <*
Direction:				
Initiate	54.56 (15.84)a	31.44 (12.31)ab	9.14 (3.77)b	0.05
Receive	12.89 (18.96)a	3.83 (4.04)a	8.50 (9.19)a	NS
Type of Touch:				
Total touch	100.22 (21.64)a	36.50 (14.01)b	16.83 (2.12)b	0.01
Positive touch	91.00 (21.87)a	30.39 (9.24)b	10.67 (0.47)b	0.01
Negative touch	0.44 (0.38)a	1.06 (1.29)a	0.33 (0.47)a	NS
Neutral touch	7.78 (11.51)a	2.83 (1.69)a	5.17 (3.06)a	NS
Body Area Touched:				
Top-front	55.89 (41.58)a	24.33 (16.20)a	8.00 (1.89)a	NS
Upper-back	33.89 (15.25)a	4.89 (7.07)b	3.67 (1.89)ab	0.05
Lower-front	17.33 (19.94)a	2.77 (2.17)a	4.00 (3.77)a	NS
Lower-back	9.44 (7.60)a	8.44 (1.71)a	0.33 (0.47)a	NS
Non-vulnerable body parts	61.89 (33.79)a	25.50 (11.08)a	9.00 (2.83)a	NS
Vulnerable body parts	44.22 (21.32)a	14.94 (3.96)a	6.67 (0.94)a	NS
Purpose of Touch:				
Task	13.00 (4.48)a	14.56 (8.46)a	5.67 (2.36)a	NS
Affection	0.89 (1.53)a	1.22 (0.38)a	1.00 (0.47)a	NS
Communication	2.11 (1.26)a	4.28 (2.81)a	5.33 (1.89)a	NS
Play	0.22 (0.38)a	1.28 (0.25)a	0.50 (0.70)a	NS
Response to Touch:				
Positive	20.22 (16.60)a	13.06 (5.70)a	7.83 (4.48)a	NS
Negative	8.11 (5.32)a	11.50 (5.57)a	9.00 (3.77)a	NS

Means with different subscripts differ significantly from each other.

Correlations between the categories of response to touch and 'body-areas' touched demonstrated that a positive response was correlated with the top-front ($r = 0.75$, $p = 0.03$), and lower-front ($r = 0.88$, $p = 0.004$) areas of the body, as well as non-vulnerable body parts ($r = 0.76$, $p = 0.03$). There were no correlations between the category direction and items in any of the other categories.

Teacher Touch Behaviors

ANOVAs were also conducted on the teachers' behaviors by class for each of the item groupings. These analyses revealed very few differences among teachers across the three classrooms. One exception was a class effect for the item 'initiate' ($F_{2,14} = 8.05$, $p = 0.03$) with the amount of initiated touch being higher among the 'infant' teachers than among 'preschool' teachers. There was significantly more touch in the 'infant'

classroom than in the 'toddler' or 'preschool' classrooms ($F_{2,14} = 18.88$, $p = 0.005$). The amount of 'positive' touch was significantly higher $F_{2,14} = 20.55$, $p = 0.004$) in the 'infant' class than in the 'toddler' or 'preschool' classes. Finally, teachers in the infant class also touched the 'upper-back' areas of the body significantly more than those in the 'toddler' class ($F_{2,14} = 7.18$, $p = 0.03$).

DISCUSSION

The descriptive data that have been presented here suggest that different touch behaviors occur at different ages. In general, the infants were touched more by their teachers than the toddlers and preschoolers were. Similar results were reported by Field *et al.* (1993), who found that infants were touched more than older children. However, unlike Field *et al.* (1993), this study did not find that toddlers were touched more than preschoolers. Also, this study showed that a greater amount of positive touch was directed toward infants compared with older children. This is likely due to the nature of the caregiving situation in the infant nursery, in which most of the touching is done by teachers. There was significantly less 'task' related touch among preschoolers than among the other two groups. At least two factors could account for this result. 'Task-related' touch was operationally defined as that which occurs in the process of performing or helping another to perform a function (not related to playing). For example, picking up toys. It is possible that older children work more independently when performing such functions. Alternatively, more advanced motor coordination may contribute to a lower incidence of touch during such activities.

Most of the touching that occurred in the toddler and preschool classrooms involved touch among the children themselves (i.e., there was less touch involving teachers). Analyses of touch behaviors in these classes suggest that there is a developmental change in the use of touch. Toddlers engaged in more affection-related touch than did infants (who showed no such behaviors) while preschoolers did not. This contrast suggests that by preschool age, children demonstrate less affection in the classroom setting than toddlers. However, these differences must be interpreted with caution. Very little affection-related touch occurred across all three age groups, and toddlers and preschoolers did not differ from each other with respect to this measure.

Jones and Yarbrough (1985) indicated, touch behaviors among adults depend, in part, on the level of intimacy shared by the interactants. "Vulnerable body parts" (i.e., the head, neck, torso, lower back, buttocks, legs and feet) are touched by persons of close intimacy, while "non-vulnerable body parts" (i.e., the hands, shoulders and upper back) are touched by persons of varying degrees of familiarity and intimacy. While it is necessary to determine if these results are generalizable to a broader segment of the population, it is likely that this pattern of touch behavior among adults represents cultural norms for our society. Preoperational thinking skills permit this acculturated categorization by the preschool years.

In the present study, children in the preschool classroom demonstrated significantly less touching of vulnerable body parts than children in the toddler classroom. Thus, Heins' (1988) suggestion that adult touch behaviors were not present among children was only partly supported by the results of the present study. Toddlers did not use adult-like touch behaviors. However, the preschoolers in this study resembled the adults in the Jones and Yarbrough (1985) study with respect to the body areas touched. One interpretation of this finding is that prior to age four (i.e., preschool age) children have not learned cultural norms regarding the use of touch. However, by the time children are in preschool, they conform more to adult standards of touching.

The present research has provided only preliminary information on how young children use touch. Much more data are needed to determine developmental trends in touching behaviors and how these behaviors are learned, and, as in the adult literature, it is necessary to determine the reliability of the present findings. Nevertheless, this study contributes to our knowledge of the use of touch among children in nursery school settings.

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