DOCUMENT RESUME

ED 167 276 PS 010 430

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TITLE Age and Sex Differences in Interaction with a Human Infant.
PUB DATE Mar 79
NOTE 22p.; Paper presented at the Biennial Meeting of the Society for Research in Child Development (San Francisco, California, March 15-18, 1979)

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS *Age Differences; Behavior Patterns; *Children; Elementary School Students; *Interaction Process Analysis; Play; Preschool Children; *Prosocial Behavior; Proximity; *Sex Differences; Verbal Communication; *Young Adults
IDENTIFIERS *Nurturance

ABSTRACT

This study examines age and sex differences in nurturant behaviors displayed toward a male infant by 60 subjects, both male and female, from three age groups: preschoolers, preadolescents, and young adults. The infant was 12 months old at the onset of the study and 16 months when the testing was completed. Each subject was videotaped for seven minutes in a room which contained the infant and infant toys as well as books and magazines appropriate to the age level of the subject. The instructions indicated to the subjects that the infant's interactions with others were being studied and that the subjects were free to choose whether or not to interact with him. Subject behaviors in the categories of proximity behaviors, vocalizations, and play were time-sampled from the resulting videotapes. Results indicated significant sex and age differences in the frequency of nurturant behaviors. In general, males and preschoolers interacted less with the infant than did females and subjects in the older age groups. Consistent sex differences were found at all three age levels. (Author/ED)

Age and Sex Differences in Interaction with a Human Infant

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Paper presented at the Society for Research in Child Development

San Francisco, March, 1979

The behaviors involved in nurturing the young are surely among the most important to any species, since they so directly contribute to survival. Although such behaviors are occasionally referred to as parental (Bolwig, 1959), the more common term is maternal behavior (Rheingold, 1963). In fact, it is widely assumed (Hutt, 1972; Maccoby & Jacklin, 1974) that nurturance of the young is limited to, or perhaps better performed by the female of the species, at least in mammals. In the case of the human being, this widely held belief has little solid data to support or, for that matter, to refute it (Maccoby & Jacklin, 1974).

One largely ignored question is how parental or nurturant behavior develops. How children and adolescents react to and interact with infants, and whether an early sex difference exists, are questions yet to be answered. Recently, in their comprehensive review of the research on sex differences Maccoby and Jacklin (1974) pointed out that we know almost nothing about the potential of human beings, children or adults, for nurturant behavior toward infants and children. One of the first studies to examine this question did so only tangentially (Brindley, Cla[illegible], Hutt, Robinson & Wethli, 1972). These authors observed the social behavior of nursery school children, focusing on aggression, cooperation, and play. They noted that girls cooperated more, especially in responding to requests from younger children. The authors interpreted this finding as evidence of the female's biologically determined role of caring for the young.

A more recent study specifically followed Maccoby and Jacklin's (1974) suggestion to examine the behavior of pre-school children toward an infant (Berman, Monda & Myerscough, 1977). Children from 2 1/2 to 5

years of age were observed interacting with a 13-month-old infant girl in a day-care setting. The infant was brought to the setting by the experimenters and placed in a playpen, in an area of the day-care center. They recorded children's frequenting the area when it contained only the empty playpen as well as when there was a fish tank placed in front of the empty playpen. All conclusions were based on comparisons of baby, fish, and baseline days. The researchers observed which children came near the baby and what they did while near her. They found girls to be more likely to come near the baby, regardless of age. Older boys were the least likely to come near the baby.

Few other researchers have ever presented subjects with a human infant with whom to interact. Only recently has the nurturant behavior of school-aged children been examined. Feldman, Nash, and Cutrona (1977) studied 8- to 9-year-olds' and 14- to 15-year-olds' interest in a baby in a contrived "waiting room" situation with the baby's mother present. The major sex differences in interest in and interaction with the baby appeared in the older group. There were few differences in the 8- to 9-year-old group although the boys ignored the baby more than did the girls of this age. The authors explained their findings as being a result of the heightened interest in sex-stereotyped behavior in early adolescence. One group of researchers (Bem, Martyna & Watson, 1976) has observed college students in interactions with infants. Bem et al. presented each of their college-student subjects with one of 14 babies randomly introduced as "David" or "Lisa". Each subject interacted with the infant alone for 10 minutes in a room containing a one-way mirror. The presence of certain behaviors (e.g., talking, kissing, holding, etc.) was recorded by observers. In this

study no overall difference was found between males and females in their behavior to the infant.

In an examination of adults' play with 15-month-olds (Frisch, 1977), male and female adults were somewhat sex-stereotyped in their style of play with the babies. However, the study made no overall examination of nurturance to (or interest in) the infants since its purpose was to examine the different ways in which boys and girls were played with by the adults. The major finding was that boys and girls were played with by the adults. The major finding was that boys were played with in "masculine" ways and girls in "feminine" ways.

It is clear that there is much yet to be discovered about nurturance to the young in humans. Pre-school and adolescent girls may be more nurturant than same-aged boys (Brindley et al., 1972; Berman et al., 1977; Feldman et al., 1977) though this does not appear to be true for young adults (Bem et al., 1976). As part of a larger project, the present study examined age and sex differences in nurturant behaviors shown while interacting with an infant. The behavior of preschool children, preadolescents, and young adults was studied. Up until this time nurturance to the young shown by a wide range of subjects had never been studied using identical procedures as part of the same experiment. In addition, children, of any age, had never been observed on a one-to-one basis with an infant.

METHOD

Subjects. Twenty subjects (10 male; 10 female) from each of three age groups, 4- and 5-year-olds, 10- to 12-year olds, and 18- to 21-year-olds participated in the study. This gave a total of 60 subjects. The nursery-school children were selected from a university Home Economics Department Nursery School and three community based day-care centers. The 10- to 12-year-olds attended a parochial school in 5th or 6th grade. The children's parents were informed about the study and gave written permission for their children's participation. Children gave their own consent verbally. Two 4-year-old girls who refused to participate were replaced. The college-age subjects were students in introductory psychology classes and received course credit for participation. They signed informed-consent forms prior to participation.

Procedure. A male Caucasian, aged 12.0 months at the outset of the study and 16.0 months at the end, served as stimulus infant for all subjects. Pilot data demonstrated his suitability as a stimulus. He showed little or no fear of strangers and interacted easily with pilot subjects. He did not appear to react in any clearly different way to males than to females. In fact, he was especially suitable in this regard since he had had experience with a primary male caretaker as well as a female. The baby was seated in a plastic and metal spring bouncing horse fitted with a safety plastic infant seat. There was a box containing toys and a small chair for subjects to sit on beside the baby's horse.

The baby's horse and toys were situated in a quiet room in the school or day-care center. A few books or magazines suitable to the subject's age were placed on a nearby table. A Sony black-and-white video camera and a microphone were in the room with the baby. They were connected to a Sony videocassette recorder and monitor in an adjacent room.

Each subject was brought individually to the room containing the baby. They were asked to spend a short period of time alone with him during which they would be videotaped. The subjects were told that the infant's reactions to strangers were the focus of the study. Specifically, the two groups of children were told:

> There is a baby here in this room. His name is__. We are wondering how babies like him get along with new people; people they don't know. Do you think you could stay here with the baby for a few minutes? I will be taking a TV picture of you and the baby so I can study it later. You can talk to or play with the baby if you want to. Please don't try to pick him up, though. You don't have to talk to or play with the baby, just stay here in the room with him. If you want to you can read these books on the table.

The instructions to college students were similar, with a slightly more mature level of language:

> There is a baby here in this room. His name is___. We are interested in how babies like him react to strangers and new people. What I would like you to do is stay in the room with the baby for a few minutes. You and the baby will be videotaped so that the tape can be studied later. You can interact with

the baby in any way you choose. However, please don't pick him up. You don't have to interact with the baby, just stay here in the room with him. There are magazines on the table if you would like to look at them.

The experimenter then left the subject and baby alone for a seven-minute period of interaction. The subject and baby were watched on the monitor and sessions were terminated if the subject cried or left the room of if the baby cried.[1]

The running order of subjects was counterbalanced to some extent in order not to confound the baby's experience in the situation with the age of the subjects. Approximately one-half of the youngest and oldest subjects were run during the first month of the study. Then all the 10- to 12-year-olds were run. Next the remaining adults served as subjects, followed by the remaining 4- and 5-year-olds. From one to four subjects were run during a single day and a day or more usually elapsed between each day of testing.

Certain behaviors considered to be related to nurturance were time-sampled from the videotapes. Many of the behaviors selected to operationally define nurturance have been used by others (Bem et al., 1976, Berman et al., 1977) They may be seen in Table 1.

Insert Table 1 about here

The seven-minute period of interaction was divided into 42 10-second intervals. If any of the behaviors listed in Table 1 occurred during a 10-second interval, it was recorded in that interval. This was true for all behaviors; therefore several different behaviors (e.g., kissing,

talking, touching, playing with a toy, etc.) could potentially have been recorded during any given 10-second interval. For any one behavior (e.g. touching) duration or frequency of that behavior was not assessed during a specific 10-second interval; the behavior was recorded only once per 10-second interval. The scores for each behavior were therefore modified frequency counts based on the number of 10-second intervals in which the behavior occurred. The modified frequency counts for all behaviors within a given category (e.g., proximity) were summed to obtain the total score for that category. The scores for the three categories, proximity, vocalization, and entertainment, were the dependent variables used in the analyses.

For reliability purposes a total of 12 of the videotapes were randomly selected with equal representation from each age and sex and coded by a second coder who was blind to the hypotheses. This coder, who was trained by the experimenter, was a fourth-year graduate student in developmental psychology.

RESULTS

The three behavioral scores, based on the observations of the subject with the infant, were calculated. These scores were proximity, vocalization, and entertainment. The data were subjected to a 3 (age) X 2 (sex) multivariate analysis of variance. There was a significant main effect for age, F (6, 104) = 5.04, $p < .001$. Two of the univariate Fs for age, vocalizations and entertainment, were also significant. A further MANOVA examining contrasts between different age groups confirmed the source of the age difference. There was a significant difference between the 4-year-olds[2] and the other two groups, F (3, 52) - 10.16, $p < .001$. The same univariate Fs, vocalization and entertainment, were also significant. Differences between the older age groups were not satistically significant. Although there was not a significant multivariate main effect for sex, the univariate Fs for vocalization and entertainment were significant, F (3, 52) = 6.63, $p < .01$, and F (3, 52) = 4.59, $p < .04$, respectively. No interactions reached levels of statistical significance. These data may be seen presented graphically in Figures 1, 2, and 3.

Insert Figs. 1, 2, and 3 about here

The sum of the three behavioral categories, proximity, vocalization, and entertainment, represents a measure of the total interaction with the baby. This measure is presented graphically in Figure 4. In line with the results from the MANOVA reported above, the only

Insert Fig. 4 about here

significant effects were main effects for age, F (2, 54) = 11.84, p < 001, and sex, F (1, 54) - 7.13; p < .01. A follow-up ANOVA comparing the 4-year-olds with the older groups combined was significant and again there was no significant difference between the two older age groups.

Correlation coefficients were calculated to measure the reliability of the behavioral coding. Twelve of the tapes were coded by a second coder. The correlations between the coders on these 12 tapes for proximity, vocalization, entertainment, and the sum, respectively, were .57, .98, .99, and .93.

DISCUSSION

The purpose of this study was to examine sex and age differences in nurturant behaviors exhibited toward a human infant. There was a very clear effect for age. Four-year-olds were much less nurturant than the older groups who did not differ from each other. Although there were no a priori theoretical or empirical reasons to predict an age difference, it is not surprising on intuitive grounds. Several of these children (seven boys and one girl) almost completely ignored the baby. In any case, the fact that 4-year-olds are unlikely to display as much nurturant behavior to a baby as are preadolescents and adults seems to be a perfectly reasonable finding. Similar sex differences were observed at all age levels.

Three separate categories[3] of behavior contributed to the analyses: proximity, vocalizations, and entertainment or play. The category labeled proximity included such behaviors as sitting close to the baby and touching him. These behaviors tended to be less frequent than the other two categories and to have fairly low correlations with them. When eliminating the behavior of "sitting close", the other proximity behaviors were very infrequent. The univariate analysis of variance of proximity behaviors yielded no significant sex or age differences. In addition, it was a difficult behavioral category to code from the tapes and had a very low interscorer reliability (.57). In general, proximity behaviors in this study do not by themselves seem to add much to the understanding of age and sex differences in nurturance to the young.

The second behavioral category was labeled vocalization and included talking, laughing, singing, and nonsense vocalizations.

Univariate analyses of variance of this measure yielded significant age and sex effects. Four-year-olds talked less to the baby than the older subjects and males talked less than females. Vocalization as a category tended to play the strongest role in discriminating among groups of subjects.

The third separate group of behaviors were those involved in entertaining or playing with the baby. A univariate analysis of variance on this measure also demonstrated an age difference between the 4-year-olds and the two older groups favoring the latter as well as a sex difference favoring females.

The sum of these three behavioral categories produced a total nurturance score which was also subjected to an analysis of variance. Here the findings parallelled those of vocalization and entertainment, with similar sex and age differences. The 4-year-olds interacted with the baby less than the older groups, and the males did so less than the females.

Although they are not reflected in the quantitative scores, qualitative differences appeared to exist among subjects. Different styles of interaction appeared. Some subjects did a great deal of touching, tickling, and stroking of the infant. Others played a lot with the toys, while still others bounced him vigorously in the horse, entertained him with their watches or jewelry, or played games like peek-a-boo. He was ignored by several of the youngest boys and a few adult males. This ignoring cotninued in spite of repeated overtures on the baby's part to gain the subject's attention. In general, the baby appeared to enjoy taking part in the interactions often laughing vigorously at the subject's games. Even when being ignored he managed to entertain himself fairly well by bouncing in the horse or handling toys. There seemed to be one general exception to this, however.

Many of the 11-year-old girls appeared to make the baby uncharacteristically irritable. This was true even though some time passed between the running of the first 11-year-old girl and the last. Also, the 11-year-old boys were interspersed among the girls, and they did not, as a rule, make him irritable, nor did the group of subjects coming before or after them. When examining the behavioral scores for these girls, it is clear that they score very high in nurturance displayed toward him. In addition, they seemed very enthusiastic about playing with the baby. When watching their tapes it sometimes appeared that they were, with their eagerness, overwhelming him with stimulation and not responding to his "requests" to slow down. It is possible that these girls, although intensely interested in babies had not yet developed the skills to interact effectively with babies. In contrast with the college girls, they sometimes seemed oblivious to the baby's signals and desires, stimulating him almost abrasively.

In conclusion, the present study demonstrated age and sex differences in behaviors involved in interacting with a baby. On almost all measures 4-year-olds demonstrated lower levels of nurturance than the older subjects did. There are several possible reasons for this low level of interaction. Children of this age are not often expected to care for infants, and possibly have not yet learned how to do so. They sometimes looked unsure of what to do and at times even appeared bored. Perhaps a baby holds little interest for this possibly egocentric age group. A further possibility is related to the experimental instructions. Perhaps the oldest age group could interpret the experimental instructions as a request for assistance. They were told interest was in the baby's reactions to strangers and perhaps interacted with him in order to help

the experimenter. This level of reasoning is more than likely beyond the abilities of the pre-school subjects. However, it is not certain that the 11-year-olds, whose behavior so closely resembled the 20-year-olds, would operate under similar constraints.

Males talked less, played less, and showed less overall nurturance to the baby than did females. The sex differences were quite similar across age levels. This similarity is one of the more interesting findings of the study. That 4-year-old females and males should show almost exactly the same differences in nurturance as do 11- and 20-year-old females and males is very striking. This leads to some future research possibilities. For example, does this sex difference exist at other or at all points in the ontogenetic sequence? It would be especially significant to examine parents and grandparents as well as other non-parents. Thirdly, and most importantly, if this sex difference does exist at all or at some ages, what is its source? Why do females display more behavioral nurturance towards an infant than males? Can this sex difference be modified through experience or explicit training? Do egalitarian or non-traditional conditions of rearing diminish or eradicate it? These and other questions have yet to be answered about nurturance to the young.

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Footnotes

[1]Two sessions were terminated. One subject cried and one left the room. Their data were included, filling in zero scores for the time remaining.

[2]For convenience in Table and Figure presentations, throughout this chapter the youngest age group will be referred to as 4-year-olds, the intermediate age group as 11-year-olds, and the oldest age group as 20-year-olds.

[3]A fourth category, facial behaviors (smiling, looking, and grimacing) was originally intended to be coded. However, the quality of the videotapes as well as subjects turning their backs and wandering out of camera range made this impossible.

Table 1

BEHAVIORS CONSIDERED TO BE AN OPERATIONAL DEFINITION OF NURTURANCE

a. Proximity	b. Vocalizations
face close to infant (under 30 cm)	talking
kissing	laughing
touching	singing
tickling	nonsense vocalizations
touching or tickling with a toy	
	c. Entertainment/Play
	entertaining with toy(s)
	bouncing baby in horse
	retrieving fallen or requested toy
	entertaining in some other way

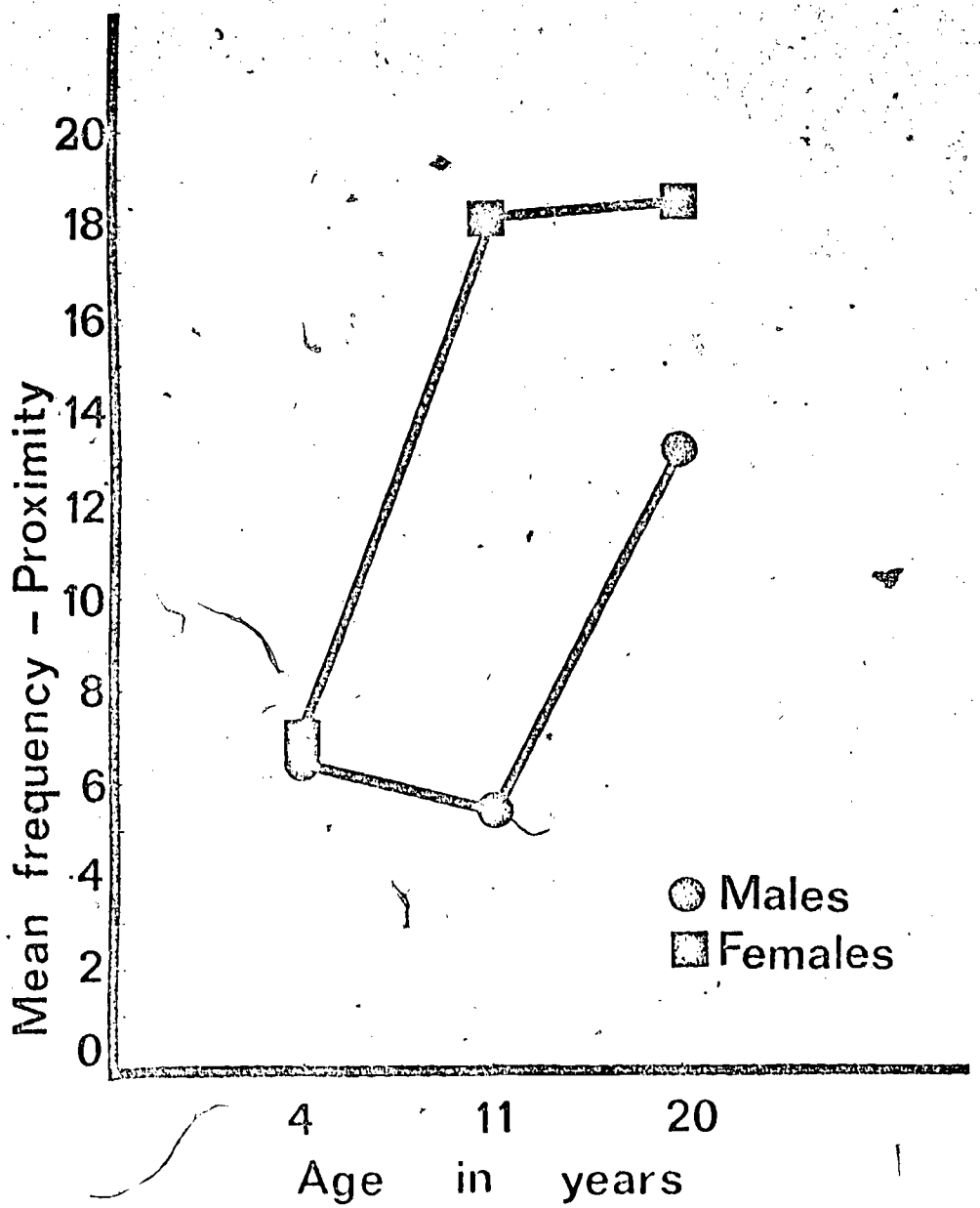

Figure 1. The frequency of proximity behaviors as a function of sex and age in years.

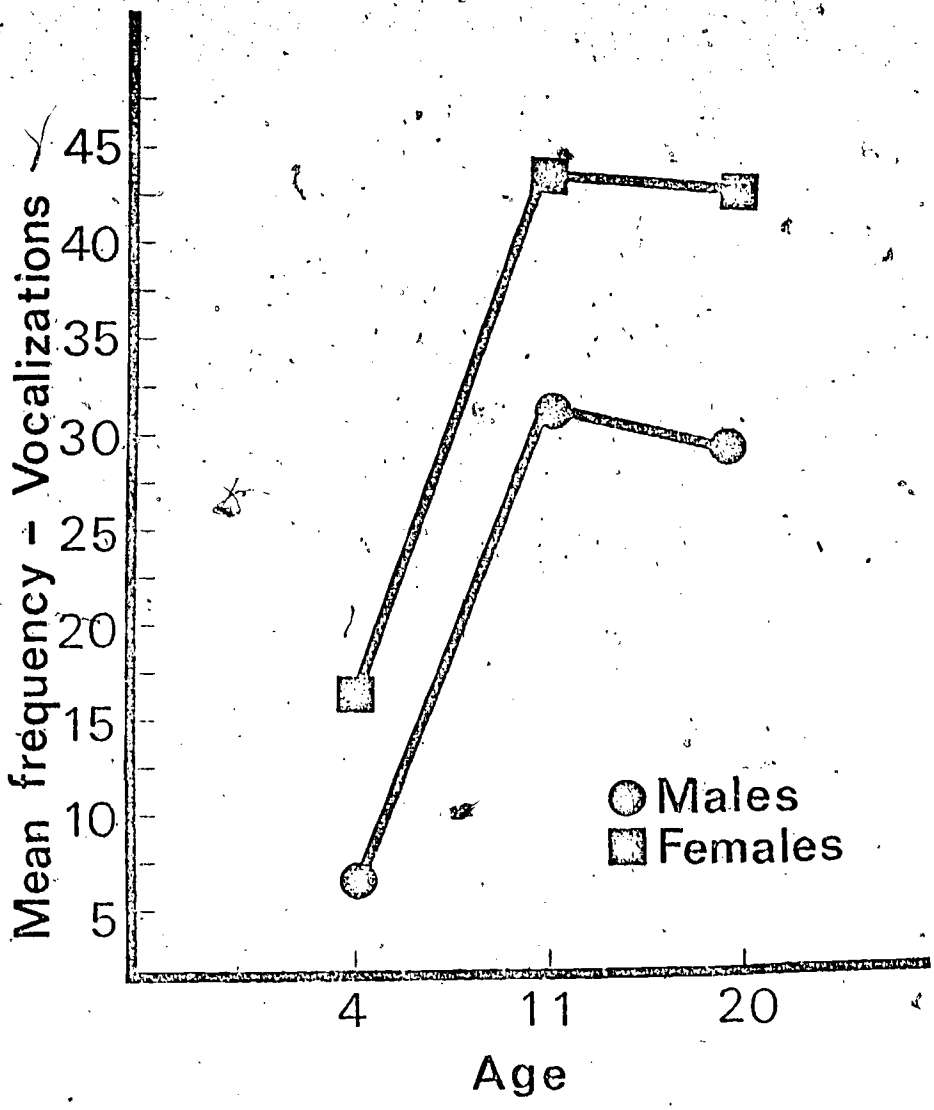

Figure 2. The frequency of vocalizations as a function of sex and age in years.

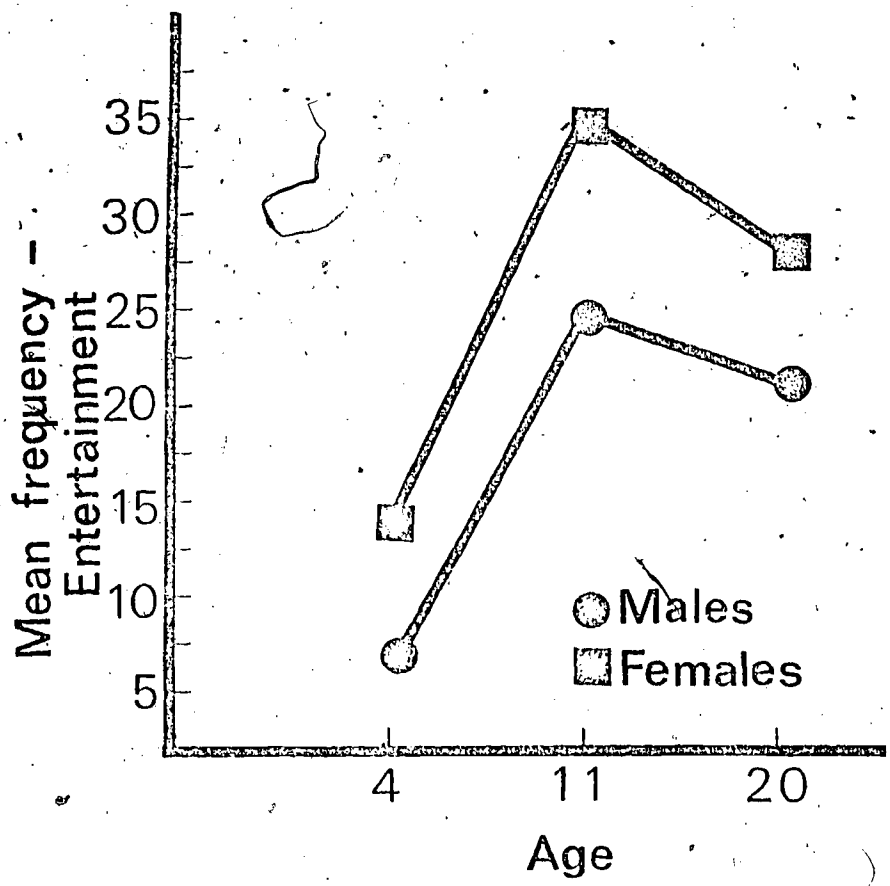

Figure 3. The frequency of entertainment behaviors as a function of sex and age in years.

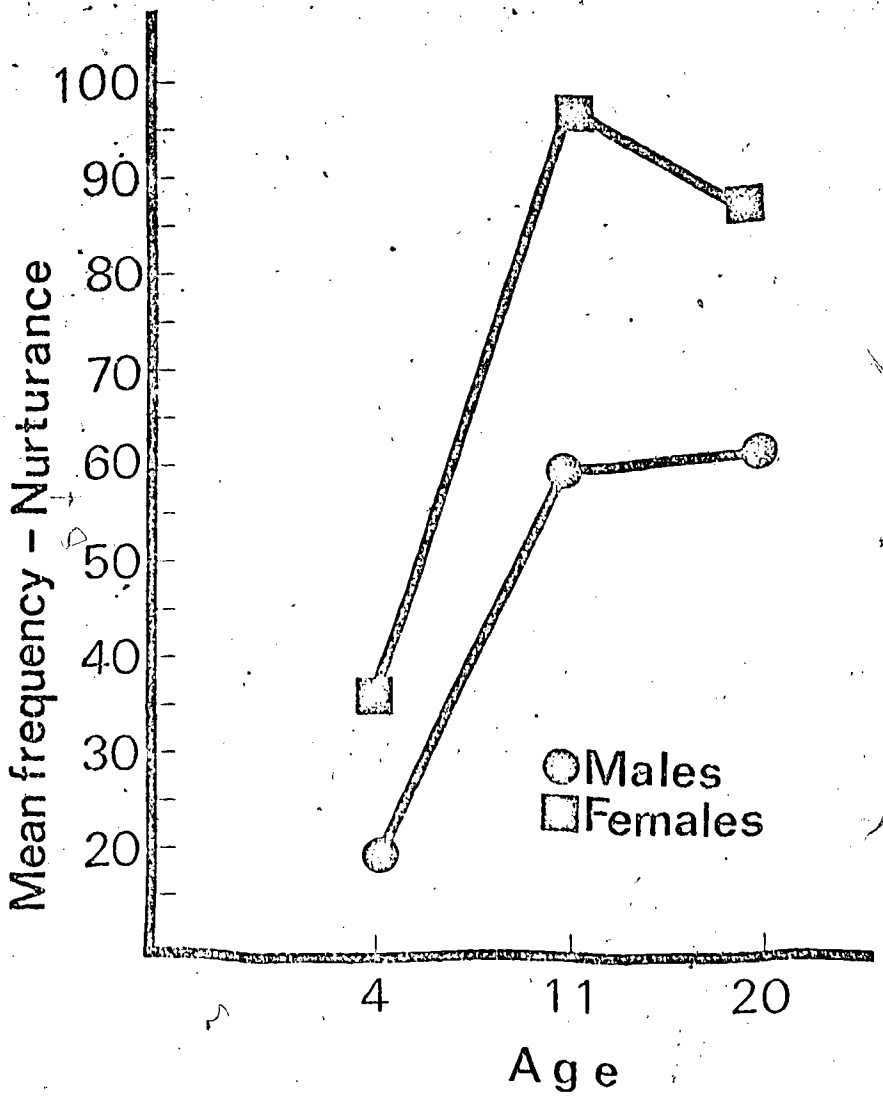

Figure 4. The frequency of all nurturant behaviors as a function of sex and age in years. This measure represents the sum of proximity, vocalization, and entertainment behaviors.