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ABSTRACT

It was recently hypothesized that the source of interactional differences between mothers and fathers lies in differences in social perception processes, such as representation of infant and coding of situational variables. From this perspective, the present work analyzes the attribution of causality in interpersonal events related to an episode of interaction between an adult and an infant at play. Mothers, fathers, and male and female nonparents were asked to produce a story for six drawings representing an episode of adult-infant play interaction. An analysis of verbs showed that mothers used state (psychological) verbs in describing infants' behavior more than did fathers and nonparents. Moreover, a within-group comparison of descriptions of adult and infant behavior showed different patterns of causality attribution. Mothers described a logically consequent pattern of causality, whereas fathers described a pattern of conjunction or joint action. Moreover, fathers tended to interpret fewer events in causal terms. Mothers attributed internal psychological states to babies and viewed adults as responding to such states in the play situation. Results show that, in general, the pattern of causality for nonmothers and nonfathers resembles that of mothers, although gender specific patterns were found for some aspects. (Author/RH)

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IMPLICIT CAUSALITY IN VERBAL DESCRIPTIONS OF ADULT-INFANT INTERACTION

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ABSTRACT

It was recently hypothesized that the source of interactional differences between mothers and fathers lies in differences in social perception processes, such as representation of infant and coding of situational variables. From this perspective, the present work analyses the attribution of causality in interpersonal events as related to an episode of adult-infant play interaction.

Mothers, fathers, and non-parents were asked to produce a story for six drawings representing an episode of adult-infant play. The analysis of verbs (cfr. Brown and Fish, 1983) showed that mothers use state verbs in describing infants' behaviour more than the other groups. Moreover, a within-group comparison of descriptions of adult and infant behaviour showed different patterns of causality attribution.

BACKGROUND Research in the 70s on social and communicative development in the 1st year of life showed sophisticated mechanisms of mutual adaptation and responsivity in mother-infant interactions. These which were described in terms of characteristics that lead to, or provide "scaffolding" for the development of social and communicative skills. On the basis of these findings, researchers became interested in studying infant interactions with other social partners, first of all fathers. Depending on the theoretical background, basic similarities or foundamental differences between maternal and paternal characteristics of interaction were predicted. After investigation of verbal, non-verbal, and play features, in the 80s we know that there are both important similarities and differences. More specifically, the results indicate a pattern of "similar rules - different styles" in interaction.

ISSUE Since mothers and fathers follow the same rules in interacting with babies (e.g., share the attentional focus), we can assume that they have more or less the same competence, but their different styles indicate that something mediating between general competence and actual interaction is different for mothers and fathers. One obvious hypothesis is that the differences lie in maternal vs. paternal socio-biological roles per se. Although not much research has yet been done, one other hypothesis is that the observed differences are linked to different attitudes or beliefs about babies. We have started to investigate such social perception processes in adult-infant interaction. The present study was designed to investigate some aspects of causal attribution in dyadic adult-infant interactions from this perspective. Specifically, the questions at issue were: to what extent is a causal role attributed to infants engaged in interaction? Are there any differences in causality attribution to adult and baby? On the basis of previous research, it is hypothesized here that mothers and fathers present different patterns of causal attribution.

RESEARCH STRATEGY Recent research in psycholinguistics and social cognition has shown a neat relationship between language and personal causality in comprehension-perception tasks. Brown & Fish (1983) suggested that specific attributions of causality are made to either one or the other actor of interpersonal events according to the type of verb (action vs. state) and semantic schema involved (e.g. Agent-Patient or Stimulus-Experiencer). Models of causality implicit in verbs have been proposed which are suitable for predicting what actor is perceived as the causal source of the event. In the present study, one of these models was used to investigate causality attribution in adult-infant interaction in a speech production task.

CLASSIFICATION SYSTEM Semin and his colleagues (Semin & Fiedler, and Fiedler & Semin, in press; Semin & Greenslade, 1985) suggested that the same interpersonal event can be described by four types of terms:

descriptive action verbs (DAV): mere description of a concrete behaviour (e.g., S hits O)
interpretative action verbs (IAV): interpretation of the concrete behaviour (e.g., S attacks O)
state verbs (SV): reference to a psychological state (e.g., S hates O)
adjectives (Adj): reference to personal attributes, that mantains only an indirect reference to empirical events (e.g. S is hostile).

Experiments showed that: (a) from DAVs to Adj there is an increase in knowledge involved whereas there is a decrease in situational

informativeness and verifiability so far as a listener is concerned; (b) while DAVs do not reveal any constant locus of causality, IAVs induce attributions to the sentence Subject and SVs to the sentence Object (e.g. S attacks O because S..., and S hates O because O...). We will assume therefore that actions described by IAV presuppose causation by the Subjectand actions described by SV presuppose causation by the Object whereas DAV sentences are uninformative with respect to causality.

METHOD

Subjects 10 women (age: 23-29) and 10 men (28-35) with children younger than 18 months, all middle class. 10 women (18-35) and 10 men (18-26) without children, mainly university students, served as control groups.

Procedure Subjects were asked to produce a story for a sequence of six drawings representing an episode of adult-infant play with a toy (men saw drawings of man-infant play, and women of woman-infant play). In the instructions, the infant was always referred to in terms of "he" in order to prevent, or limit, possible effects of the infant's gender. Before the story-telling task, subjects performed a role-playing task so that they were induced to project themselves into the interaction rather than merely judging someone else's behaviour. Between role-playing and story-telling tasks, subjects were presented with a brief distractor interview. Example of experimental material in Appendix A.

Data analysis Stories produced by subjects were transcribed and reduced into individual simple S-verb-O sentences. Non-interpersonal sentences were discarded (e.g. "the baby is in a high-chair") whereas sentences involving the toy were retained (e.g., the baby is bored with the toy; the mother manipulates the toy -a Jack-in-the-box- so that the baby becomes familiar with it). As usual with production data, it was necessary to adopt classification criteria (available from the author).
The percentage of absolute agreement between two judges in the classification of verbs into the three categories (DAV, IAV, SV) was 88%.

RESULTS

Figure 1 shows the distribution of interpersonal terms used by the four groups in describing the interaction (verb vocabularies available from the author). Although some differences emerge between the groups, each of them produced most utterances containing Descriptive and Interpretative Action Verbs. After Yates' correction, a chi square carried out on a 4 by 4 matrix fell just short of significance (<.10).

Since the groups do not exhibit biases in the overall distribution, we can compare their descriptions for adult versus infant behaviour. Table 1 shows the distribution of utterances with respect to the sentence subject.

TABLE 1

	ADULT	INFANT	TOY	
MOTHERS	54	31	8	93
FATHERS	47	32	7	86
NON-MOTHERS	58	37	7	102
NON-FATHERS	58	40	2	100
	217	140	24	381

The four groups show a very similar distribution in which both adult- and infant-subject sentences are present. A possible reason for the prevalence of adult-subject utterances is that the role-playing task performed before story-telling might have induced an adult-centred bias. Nonetheless, adult and infant descriptions are comparable in all four groups.

DESCRIPTION OF ADULT'S BEHAVIOUR Figure 2 shows the distribution of interpersonal terms used in describing the adult's behaviour in adult-subject sentences. Whereas Fathers use mainly Descriptive Action Verbs, the other groups use more Interpretative Action Verbs. This means that Fathers' descriptions contain less causal information than the descriptions of the other groups which impute causal responsibility to the adult.

DESCRIPTION OF BABY'S BEHAVIOUR Figure 3 shows the distribution of terms used in describing the baby's behaviour in baby-subject sentences. Whereas Mothers use mainly State Verbs, the other groups use more Descriptive Action Verbs. In addition: (a) Non-Mothers use more State Verbs than men, (b) men use more Interpretative Action Verbs than women, (c) Mothers mention also Adjectives. This means, in general, that Mothers establish the locus of causality for the baby's actions in the adult's behaviour while the descriptions of the other groups contain less causal information. However, to understand the implications of these results, it is worth plotting together adult and baby descriptions together within each group.

WHAT INTERACTION? Figures 4a-d show the distribution of interpersonal terms used in describing both the adult's and baby's behaviours within each group. Mothers' and Fathers' descriptions are dramatically different: while Mothers describe the adult's and baby's behaviour by two diverging lines, Fathers do so by two almost perfectly parallel lines. In other words, the descriptions of adult and baby behaviours are very different for Mothers (chi square(Yates correction)=20.0296, DF=3, $p<.001$) and very similar for Fathers (chi square n.s.).

The Mothers' pattern of causality includes sequences such as "Mother IAV Baby/toy" - "Baby SV Mother/toy" - "Mother IAV" (e.g., "M makes B get to know the toy - B gets bored - M tries again to attract B's attention"), that is in both adult and baby descriptions, the adult is consistently assumed to be the locus of causality in the course of

interactional events. But, it is also important to notice that internal psychological states are attributed to the baby which probably alert the mother to the next step in adjusting her behaviour to the baby's state. Therefore, a pattern of mutual influence emerges, although causal responsibility for the development of interaction is held by the adult.

Rather than identifying causal units, Fathers appear to describe concrete individual actions by sequences as "Father DAV - Baby DAV" (e.g., F shows toy - B laughs). It is intersting to note that Fathers describe adult and baby behaviour in almost the same terms, so that adult and baby are almost equally responsible for the course of interaction (about same percentage of IAVs). This pattern may be described as two parallel lines of action which cross from time to time rather than as a pattern of mutual influence.

Non-Mothers and Non-Fathers identify causality to a lesser extent than Mothers (higher percentages of DAVs). Nevertheless, in contrast to Fathers, they do differentiate adult and baby descriptions (N-Ms' chi square=10.3122, DF=2, $p<.01$; N-F's chi square(Yates correction)=7.1665, DF=3, $p<.10$). Both groups appear to attribute a causal role to the adult (adult IAV descriptions); the causal pattern is more consistent among Non-Mothers (baby SV descriptions). Although the description of the adult's behaviour is very similar in the two groups, the description of the baby's behaviour is not: Non-Mothers tend to be similar to Mothers in using SVs frequently whereas Non-Fathers tend to be similar to Fathers in using SVs infrequently.

CONCLUDING REMARKS

The results show a remarkable difference between Mothers and Fathers in the perception of causal relationships implied in play interaction. Mothers describe a logically consequent pattern of causality (if A is causal agent of interactional event E (IAVs), B cannot be the causal agent (SVs)), whereas Fathers describe a pattern of conjunction or joint action (A does this & B does that; A is causal agent of E & B is causal agent of E'). Moreover, Fathers tend to interpret fewer events in causal terms. Mothers attribute internal psychological states to babies; in response to such states, the adult initiate developments in the play situation. According to the linguistic model of interpersonal causality applied here, the use of Interpretative and, above all, State verbs by Mothers also demonstrates an increasing recourse to knowledge about babies and interactions with them. In this sense, Fathers appear not to use/possess such schemata in interpreting adult-infant interaction. For instance, the same scene may be described by Mothers as "Baby is interested in toy" (SV) and by Fathers as "Baby laughs" (DAV), implying that Mothers know how a baby expresses "interest", or, at least, that Mothers use this type of knowledge and Fathers do not.

Although these results cannot be considered conclusive because of the artificial situation and small sample, they appear consistent with the literature on mother/father-infant interaction. For example, the play behaviour of fathers has been often decribed as that of a "playmate": the undifferentiated descriptions of baby's and adult's behaviour by Fathers seem consistent with such observations.

Finally, the results for Non-Mothers and Non-Fathers resemble Mothers' pattern of causality, in general, although for some particular aspects there are gender-specific patterns. This means that it is the interaction of social role, absolute experience and everyday experience (conceptualized as "availability" of a real baby, or the caretaker role in general) which determines the specific pattern

observed in Fathers, and not a single variable. In effect, if social role were the fundamental variable, we should observe differences between women and men; if it were everyday experience, we should observe difference between parents and non-parents; if it were relative amount of experience, we should probably find a continuum with mothers at the top and non-fathers at the bottom, while fathers and non-mothers would both be expected to occupy together an intermediate position (at least in Italy).

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FIGURE 1.

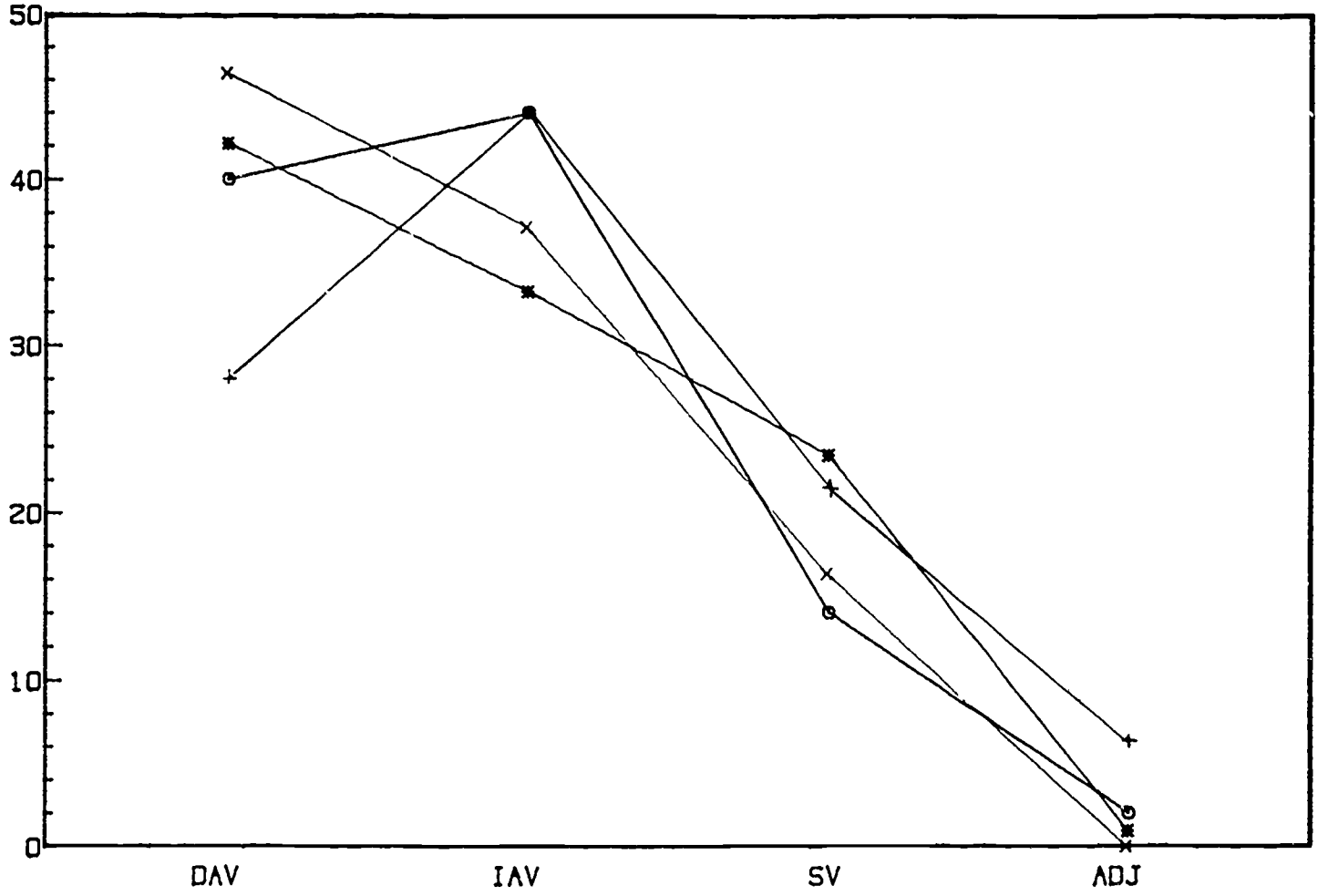
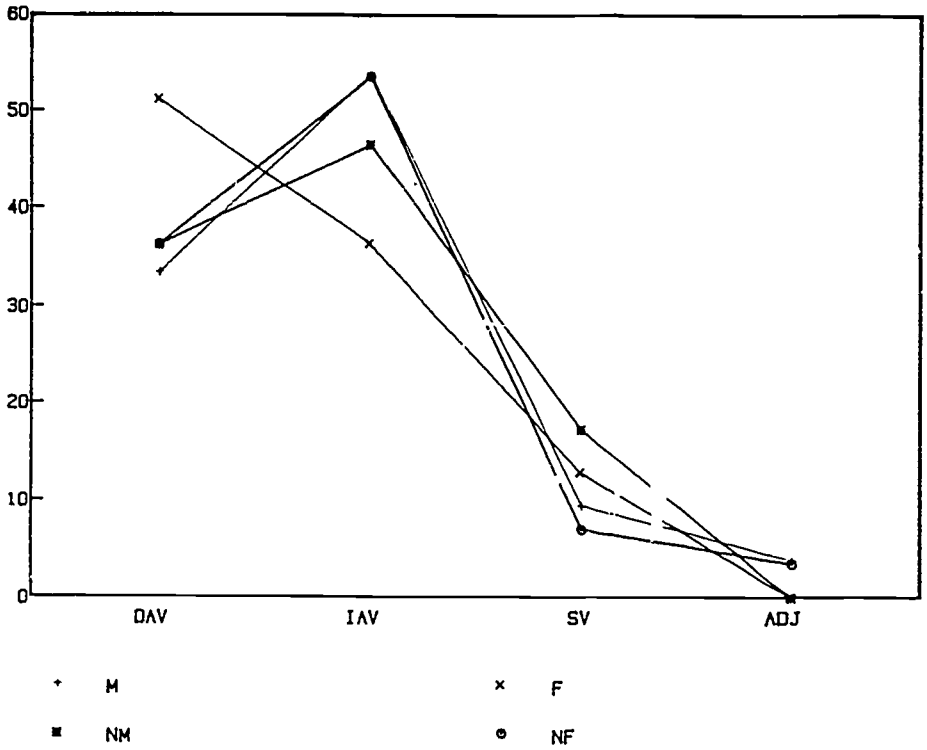


FIGURE 2.



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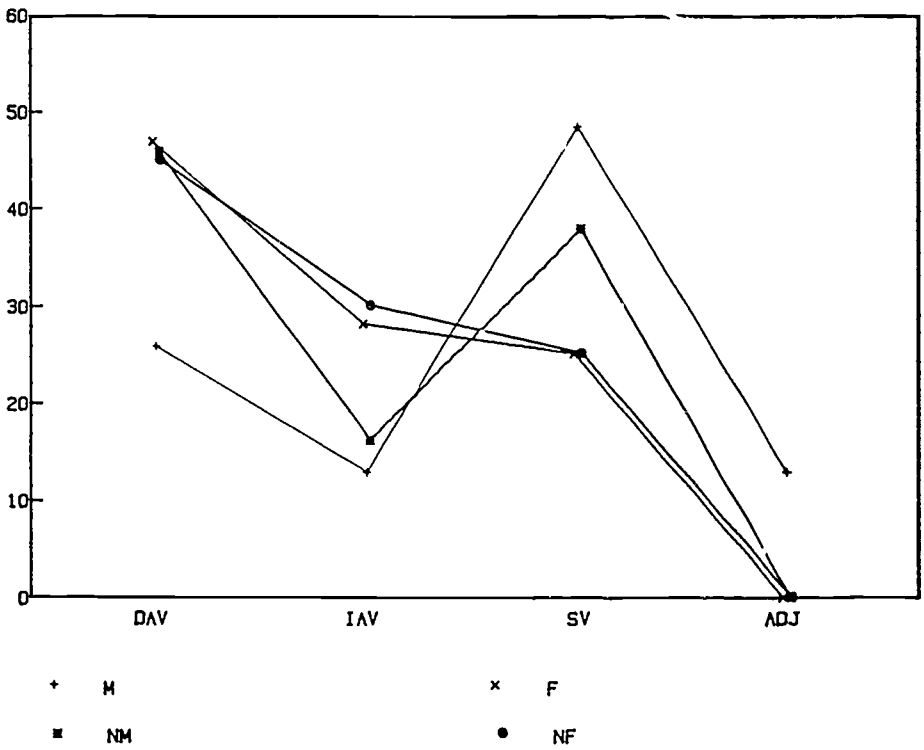


FIGURE 4A MOTHERS.

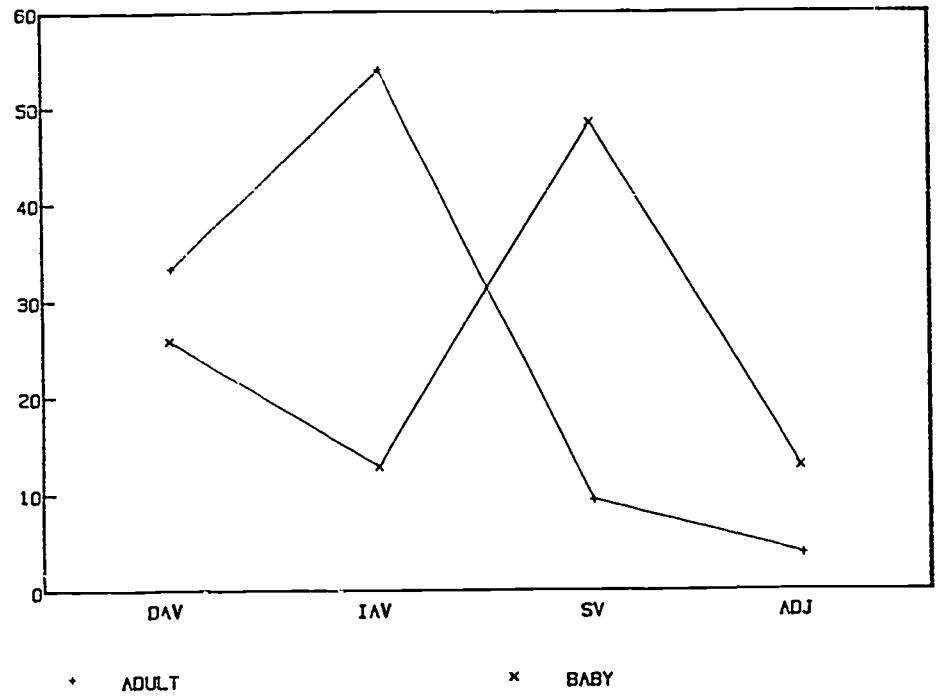


FIGURE 4C NON-MOTHERS.

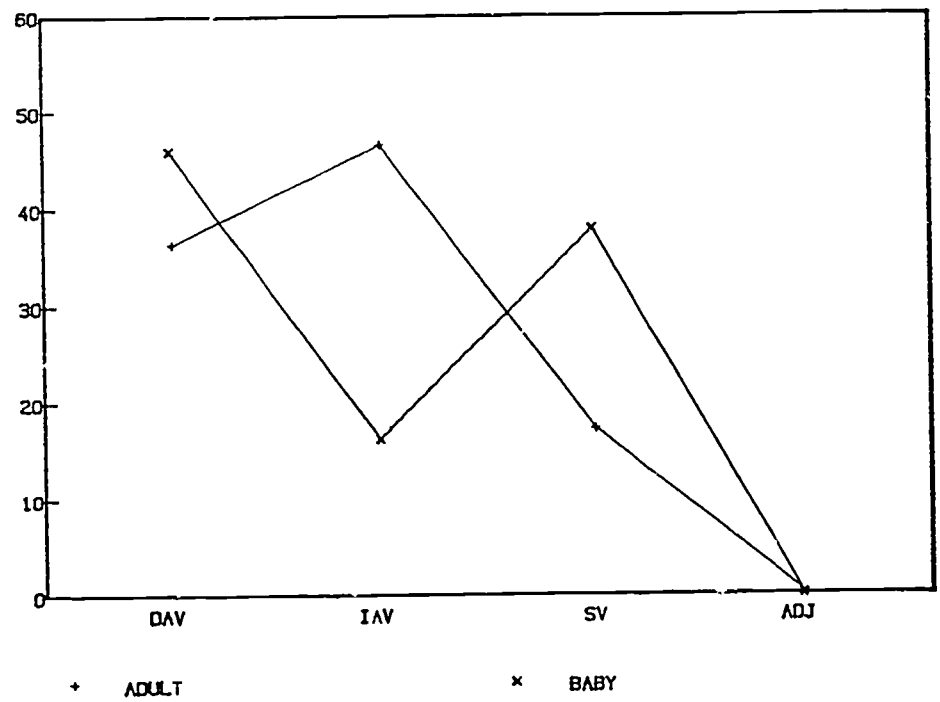


FIGURE 4B FATHERS.

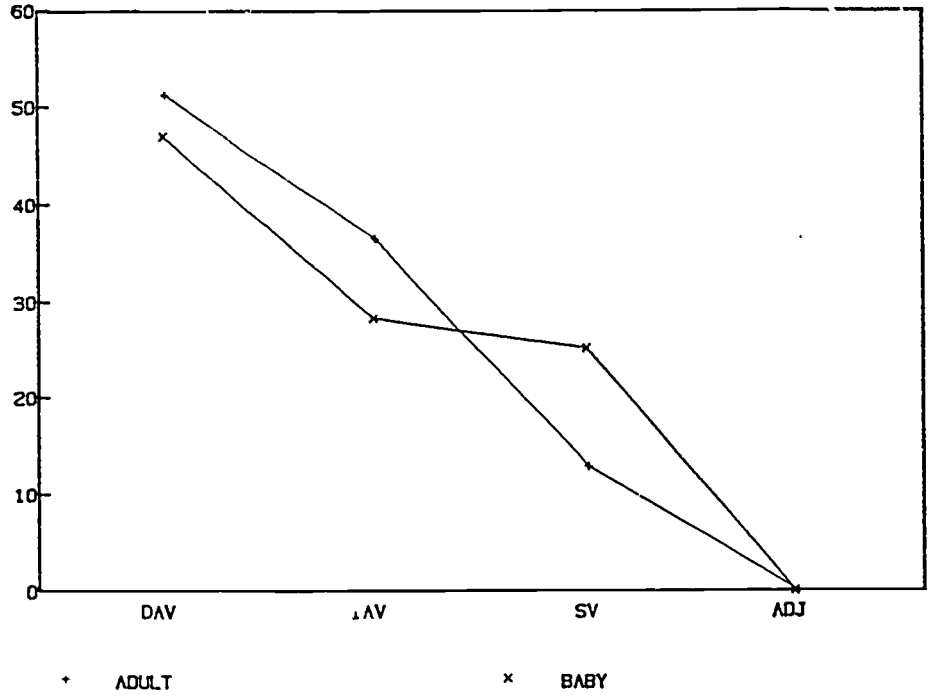
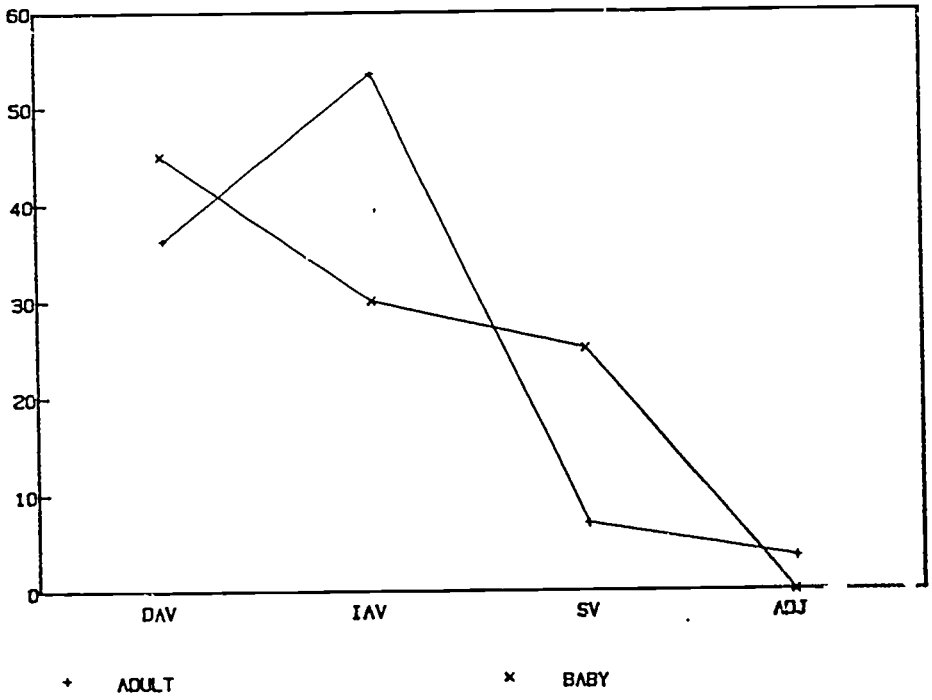
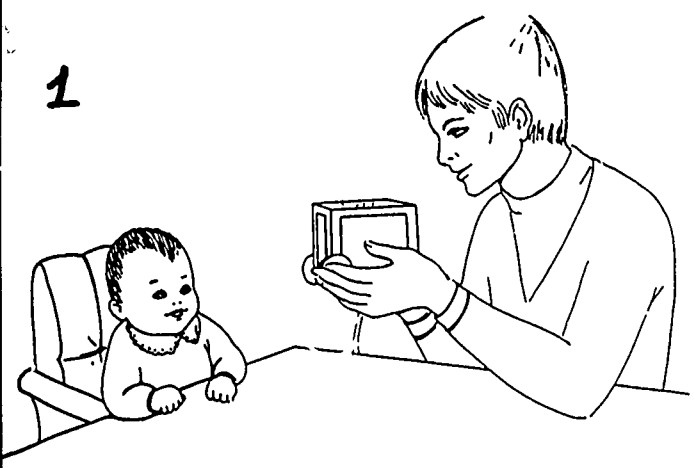
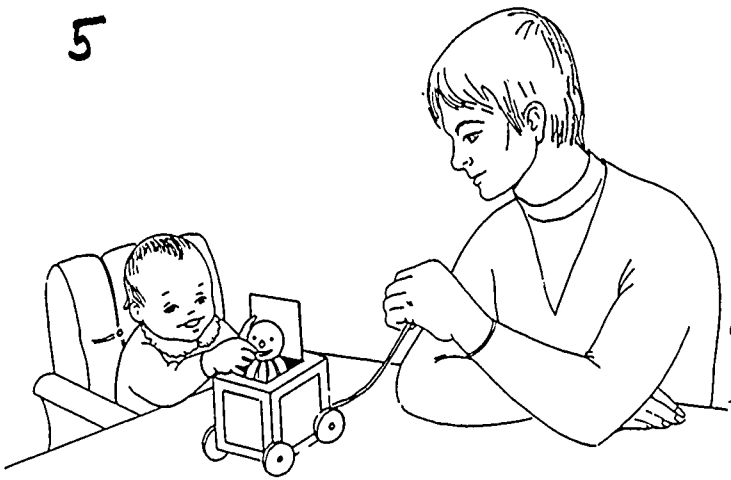


FIGURE 4D NON-FATHERS.



APPENDIX A