

The effect of different caretaker types on the
activity and social behaviour of preschool
children in an urban park playground.

Thesis presented for the degree of Doctor of Philosophy

by

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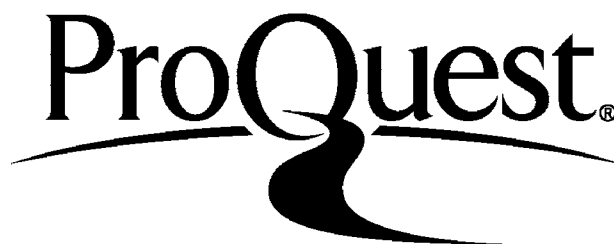
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ABSTRACT

This study aims to assess whether children have measurably different relationships with some of the familiar adults in their everyday world. Assessment is made by observing preschool children in a conventional park playground ,and evaluating whether their activities and social behaviour differ depending on the caretaker type/s accompanying them.

The study is in three parts. The first is an empirical validation of the research venue. Since playgrounds are rarely used in developmental research, it is important to establish that the patterns of behaviour observed there are generalisable.

The second part is a comparison of children accompanied by either mother, father, grandmother, nanny, or peer's mother. All 5 caretaker types were found to exert some unique influences, although similarities outweighed differences.

The third part compares the effect of a single caretaker accompanying a child with the effect of two caretakers . This allows for assessments of the robustness of caretaker influences. Caretaker effects were found to be dynamic, with two caretakers having an effect which could not be predicted from their effects when alone with a child. There is also evidence of some caretakers having a more dominant effect on children's behaviour than others.

It is concluded that caretaker roles provide consistent predictors of children's activity and social behaviour, although roles are probably only one of a number of salient factors in determining the effect of different familiar adults on children.

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To Tom Brown, for the tranquility of home and many pleasures.

To Peter Henzi ,for many years of mutual curiosity about man and monkey.

To Mom and Dad, 6000 miles away.

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CHAPTER 1 : THE CHOICE OF RESEARCH VENUE : USING A COMMUNITY SETTING
FOR THE STUDY OF ADULT-CHILD INTERACTIONS.

The present study makes use of an urban park playground in order to study children's activity and social behaviour. On the whole, developmental psychologists have studied children in three different environments : nursery school, laboratory and home. Community-based research, on the other hand, concentrates on interaction in public places. Ishida (1978) for example, studied the relationship between maternal behavior and children's decision-making ability through observing in a children's shoe store. Langer et al (1973) used an even wider range of community venues for studying mother-child interaction, drawing on a restaurant, public transport, a waiting room and a toy shop. Rosenblatt and Cleaves (1981) went even further, using ice-cream parlours, shops, an auto show, restaurants, fast food stands etc. in their study of adults and children interacting. Studies conducted in parks have included Anderson's (1972a,b) on toddler's attachment behaviour in London parks, and Wolfenstein's (1964) comparison of children's interactions in France and America. In this sense then, community-based research is not only free-range, but also opportunistic in that it makes use of venues which come ready-made - with all the advantages and disadvantages this implies for research.

Wright (1960) has provided data on how often various venues are used for observational research with children, from which it is clear that community-based research has been little favoured :

VENUE	% OF OBSERVATIONAL STUDIES USING VENUE
Nursery schools	56%
Home	22%
Miscellaneous	14%
Hospitals, Residential Homes etc.	6%
Community at Large	2%

(Wright excluded laboratory studies from his analysis, since he was concerned with observations in naturalistic settings). Although Wright's study was done some time ago, a scan of more recent abstracts suggests community venues are still quite rarely used. This may be due to one of several reasons. For example, it may be that such venues are unsuitable for answering the kinds of questions developmental psychologists are most likely to ask about social interaction; or that the community comprises too 'unscientific' an environment, being difficult to control or prone to unpredictable fluctuations that might confound results. Certainly these are points to consider, although they need not negate some of the contributions community-based research might make.

A. Potential Contributions

1. Enhancing the naturalistic quality of research

Even in the most experimental laboratory studies some attempt is usually made to simulate the real world, thus enhancing ecological validity whilst putting child and adult more at ease. However, parents are usually informed that the focus is on the child's

behaviour, which may mean they take more of a backseat in their interaction with the child than they would normally. In the popular Ainsworthian set-up, used in many studies (Lamb 1976; Ban and Lewis 1974; Brooks and Lewis 1974; Ainsworth et al 1971), this problem is even further magnified through parents being instructed not to initiate interaction with their child. Although this is done in an attempt to maximise standardisation, it is debateable whether it achieves this, since such passivity on the part of the parent may be more novel for some children than others. In most cases then, these attempts to create a naturalistic setting in laboratory studies fall well short of their aim.

Some of these difficulties are overcome in home-based and nursery studies, since these are the child's everyday milieu. But even in such cases, there is a fundamental difficulty in ensuring naturalistic behaviour from children and (particularly) adults viz. observer effect. Attempts have been made to reduce observer effect (Blurton Jones 1972b; Smith 1981; Waterhouse and Waterhouse 1973), for example, by not initiating contact with children, responding with no more than a nod or smile when approached by a child etc. It is doubtful, though, as to whether these measures have the desired effect. The author's personal experience, having followed such rules with children in nursery schools, residential nurseries and day nurseries, is that this policy makes children rather wary of the observer. Other semi-familiar adults in their milieu eg. gardeners, handymen, cooks, almost always indulge in a preliminary bout of conversation and play with children before performing their intended task, and are then quite prepared to cease work for a short while if

children demand their attention. Trying to be inconspicuous may make one even more peculiar than necessary. Parents or staff are also likely to resent such an unforthcoming attitude with their charges. Thus the traditional approach of observers may magnify rather than reduce observer effect.

Working in a community setting overcomes these problems quite substantially. Like nursery and home, it comprises an everyday milieu for the child, but it also holds the potential for using a 'hidden' observer - the observer will be only one of several unfamiliar adults in the environment, and can therefore remain quite unnoticed. In the study being reported here, caretakers were approached after observations had been made and asked for permission to use the data. Of those caretakers who made any comment at all, the majority said something like:

"Oh, I see. I thought you were that other little boy's Mum."

or

"Where do you watch the kids from?"

Only two adults mentioned that they had noticed the observer and thought her peculiar (in both instances it had begun to rain heavily and most other people had run for shelter). As regards the children, TABLE 1 reveals that they directed very little of their behaviour towards the observer.

TABLE 1 : SOCIAL BEHAVIOURS DIRECTED BY CHILDREN TOWARDS THE OBSERVER

MODE OF SOCIAL BEHAVIOUR	NO.OF 10-SEC INTERVALS WITH OBSERVER-DIRECTED BEHAVIOUR	% OF TOTAL INTERVALS WITH OBSERVER-DIRECTED BEHAVIOUR
VISUAL MONITORING(glance,gaze)	15	.07%
VISUAL COMMUNICATION(smile,wave)	5	.02%
VOCAL COMMUNICATION	1	.01%
TOUCHING	0	.00%

When compared with data collected in nurseries by Smith and Connolly(1981) in which 14% of their samples included some form of interaction with the observer, and data collected in the everyday settings of children in the American Midwest in which 20% of the children's social behaviours were directed to the observer (Barker and Wright 1955), TABLE 1 suggests that the playground may have been considerably less subject to observer effect.

Some of the present study's success in reducing observer effect is attributable to the appearance and activity of the observer. A woman in her mid-20's sitting on a park bench watching children is a common sight. By contrast, Anderson reports considerable interest and wariness on the part of both mothers and toddlers in the parks he worked in (pers. comm.). However, a young man walking to an fro in a park must inevitably be more conspicuous than a woman on a park bench.

Even so, there may still be some constraints on adult-child

interaction by virtue of the fact that it is taking place in a public setting (McGrew 1972). Nevertheless such constraints are likely to produce fewer artefactual results than most conventional studies of adult-child interaction.

2. Gathering data about the whole preschool population

Studies which work with children in laboratories or at home generally focus on their interactions with mother, since this is a fairly regular event in the child's life and one which needs little experimenter interference. However, there is a limit to how much information can be gathered in such settings. Research in nurseries provides information about broader aspects of children's behaviour, but most of the children studied are over three years old (McGrew 1972) and are largely drawn from the same background as those used in laboratory and home studies - ie. children from white middle-class families (Dunn 1976). Much of our knowledge about children is therefore based on rather a small proportion of the preschool population.

Community venues have a service to offer here in that many public places are used by a vast number of children from all sections of the population. While it is unlikely that all groups will be equally represented, that can be successfully ameliorated through selectively sampling rarely observed groups. It should be noted however that the advantage is less salient when using child-centred venues like a playground, since the children will represent a caretaker-selected group : only the more child-centred caretaker is

likely to spend an afternoon in the park with a child. Even so, the range of children that are available for observation is relatively large.

3. Looking beyond mother-child interaction to the child's broader social world

How much do developmental psychologists know about children's relationships with familiar adults other than the mother, and how important is it that they do? In 1973, Escalona wrote

"..relatively little is so far known about the variety and range of social contacts that occur day by day and month by month between the infant and other people in the family milieu".

Ten years later the same quote carries relevance. Apart from the fact that we now know more about father-child and sibling child relationships, our knowledge of children's social development is still largely based on their relationship with mother.

At this juncture it is relevant to consider a few research findings: McCord and McCord(1961) report that 39% of their sample were principally attached to a caretaker other than the mother. Clarke-Stewart (1973) reports that there was an average of one additional person in the home during her observations of mother-child pairs, and that these were usually fathers, grandparents and neighbours. Dunn (1979) mentions the inappropriateness of separating mother-child pairs from the larger social group; since they do not comprise an independent unit, they must be seen in context. In this context,

Dunn and Kendrick (1982) report their sample of children as having regular contact with maternal and paternal grandmothers and other relatives. From an ethological point of view, it is worth remembering that the 'environment of evolutionary adaptedness' probably constituted mother, father, a range of familiar peers and siblings, and several familiar adults of both sexes (Bowlby 1971; Blurton Jones 1974).

All this would seem to suggest some merit in expanding research to include the broader range of caretakers that children have access to in the real world. As Richards (1974) has written, early Bowlbyan work was interested in the mother-child bond and its relation to subsequent development. Now though, the central question tends to be the growth of sociability as a whole, which lends support to a trend towards empirical expansionism.

However, there are considerable difficulties in gaining access to caretakers other than the mother. Some researchers have resolved this through the use of indirect techniques like mothers' reports of interaction between child and father (Pedersen and Robson 1969), but poor correlations have often been reported between interview and observational data (Antonovsky 1959; Ammons and Ammons 1949). By comparing children's interaction with mother and nursery teacher, Tizard et al (1982) have solved the problem of limited access, although the usefulness of such comparisons is limited by the fact that environmental/situational differences are confounded with differences in caretaker type. By comparison with these approaches, a community-based study offers more regular access to a broad range

of adult-child combinations, all within a constant environment (see TABLE 4, Chapter 8)

Taking the point about studying sociability as a whole even further, one is also likely to be interested in how a child combines interaction with adults and interaction with other children, both familiar and unfamiliar. While the former has been very successfully handled in the nursery school which provides an ideal research setting for this. interaction with unfamiliar children has been largely confined to laboratory studies. There are a number of problems in the conventional design of these laboratory studies. For example, Ross and Goldman's (1977) work (which is fairly representative of this area), involves two unfamiliar children and their mothers being placed in a laboratory playroom. The mothers are instructed not to interact with their children. The results suggest that unfamiliar children are extremely gregarious with one another : 2000 units of initiation in 800 minutes of observation. One might well postulate that this is a result of there being little else for these children to do, being in a confined space with few toys and a pair of unresponsive adults.

This is not to say that such an experimental design is without value, but that its value is limited to the detailed analysis of interactional content. However, statements about children's propensity to interact with one another which are based on studies using this design (eg. Ross and Goldman 1977; Bronson 1974; Lenssen 1973; Eckerman et al 1975) may be based on little more than experimental artefact. Support for this can be found in the research

of Dragsten and Lee (1973), in which a comparison of unfamiliar peer contact in laboratory and nursery settings was made - significantly fewer contacts were made in the normal nursery setting. Similarly Rosenblatt and Cleaves (1981) found children interacting only rarely with their peers when adults were also present.

B. Difficulties encountered in community-based research

1. Matching and control of variables

Probably the most considerable drawback is that the researcher has little control over subjects (McGrew 1972). While, as previously mentioned, selective sampling can be used to overcome the problem of unequal groups, that is not the entire problem. There is also no facility for matching groups across variables like family background, quality of parenting, degree of familiarity between caretaker and child etc. This limits its usefulness to descriptive work, pilot work aimed at generating meaningful hypotheses, or field tests of some laboratory findings. Establishing causal relations between aspects of social behaviour would rarely be feasible.

2. Constraints on levels of description

Unless hidden cameras and microphones can be used, it is also difficult to observe fine-grained aspects of behaviour that reflect features like intensity, affective tone, and synchrony of interaction. In many instances these may be the primary units which distinguish one interaction from another (Hinde 1979; Margolin and

Patterson 1975; Halverson and Waldrop 1970).

It is also rarely possible for speech to be accurately recorded (except in quiet indoor venues). The shortcomings of this can be understood in terms of the great contribution analysis of speech content has made to our understanding of social development. With reference to the present study, speech recordings have proved a powerful tool in distinguishing various styles of adult-child interaction (Lytton 1976; Tizard et al 1982; Wood et al 1980; Sylva et al 1980).

These constraints on description have affected many of the studies that have been done in the community : some have used little more than anecdotal accounts of what was observed (Wolfenstein 1964); others have been confined to purely objective and readily observable behaviours eg. smile, talk, touch (Rosenblatt and Cleaves 1981; Hayward et al 1974) It is doubtful whether full justice can be done to such behaviours without additional reference to their context and quality.

3. Constraints on representativeness

There can be no doubt that community venues are ecologically valid for research. However that advantage is tempered by the fact that few community venues feature largely in the child's routine. Barker and Wright's (1955) study of children in the American Midwest revealed that only 1.5% of the average preschooler's day was spent in the community, and only 4.3% of this was in open spaces like playgrounds. This may reduce the generalisability of results

considerably. However, Anderson (1972a) in his park study made use of a small sample of voluntary mothers from local clinics, who reported that their children's play was the same anywhere "as long as we are with him". Although parks and other community venues may be novel for children then, they may cause only minimal disruption of everyday social interaction patterns

4. Minor problems

Research of this nature is time-consuming : the present study involved 600 hours of field work. While this investment of time is no more than average as regards ethological field research, it compares very unfavourably with more conventional approaches to adult-child interaction. As with all other ethological investigations, one is hampered too by minor problems like bad weather, subjects moving out of sight, etc.

In addition, there are flaws evident in previous community-based studies which may bring the validity of this approach into question. Anderson (19), Rosenblatt and Cleaves(1981) and Ley and Koepke (1982) all resorted to guesswork in establishing the relationship between adult and child. Anderson, and Ley and Koepke assumed that a woman between 20 and 40 alone with a toddler was its mother. This may not be a reliable assumption, since in the present study such women could also be aunts, nannies or next door neighbours - some of the grandmothers in the present study looked more like mothers too. More seriously perhaps, they also guessed the age of toddlers in order that age could be included as an independent variable in

analysis. Problems of this nature are not insurmountable however, since it is possible to talk to the caretaker after an observation has been completed.

In conclusion then it is probably fair to say that the merits of a community-based research design are very much dependent on the aims of a study, since these will determine the degree to which advantages outweigh difficulties or vice versa. In the main however, it does seem to comprise an under-utilised methodology. It has the potential for ameliorating several of the problems encountered with more conventional methodologies.

CHAPTER 2 : COMPARATIVE ASSESSMENTS OF CHILDREN'S INTERACTIONS WITH
FAMILIAR ADULTS - RELEVANT RESEARCH.

Most of the research in this field can be divided into two areas. First research originating in attempts to evaluate theories of infants' monotropic attachments to mother. Second research concerned with whether different adults make different contributions to a child's experience and long-term development. The two will be dealt with separately, although they have not been mutually exclusive in research : both Lamb (1977b) and Clarke-Stewart (1978) have studied the attachment and broader social interaction patterns of children with their mothers and fathers.

1. The empirical and theoretical assessment of monotropy and
subsequent development of attachment research.

Children were first postulated as being monotropically attached to their principle caretaker by Bowlby (1958). Monotropy has been defined as "a strong bias for attachment behaviour to become directed mainly towards one particular person and for a child to become strongly possessive of that person."(Bowlby 1971). The primary caretaker is seen as having vital importance for children's emotional and social development (Bowlby 1958), which was interpreted by some as meaning that the child's relationship with mother ought to be continuous and secure. This proved a highly emotive issue : it cast doubt on the wisdom of day care for children under 3 years old, and was taken to mean that children's relationship with mother was unique. Such issues have long been laid to rest - in academic circles at least - with the accumulation of

research revealing no long-term differences between home-reared and day-care children (Burchinal and Rossman 1961; Perry 1961), and Bowlby's later publications in which he has denied making the assertion that mothers are of special significance for children's development (Bowlby 1971). Nevertheless the question of whether children form distinguishable attachments to different familiar adults has its origins in this formulation. As Dunn (1979) has written Bowlby's later statements and qualifiers have had far less effect on research and theory than did this original notion of monotropy.

Preliminary support for monotropy came from human separation studies: children separated from their mothers exhibited a syndrome of abnormal behaviours immediately after separation (labelled 'anaclitic depression' by Spitz and Wolf (1946)), an inability to form subsequent attachments (Provence and Lipton 1962) and a higher propensity for delinquent behaviour in later life (Bowlby 1944).

These studies cannot be considered convincing empirical support however, because of shortcomings in design. Results were based on small samples - Goldfarb for example conducted five studies on the same 15 subjects (Morgan 1975). Subjects experiencing separation were rarely equivalent in age, or in onset or duration of separation (Suomi 1970). Control groups were inadequately matched with separation groups. However, the most serious shortcoming lay in the fact that disruption of the mother-child attachment bond could not be effectively isolated from several other disruptions (Pinneau 1955; Yarrow 1962; Rogers 1977a; Suomi et al 1970) eg. paternal and

sibling separation, removal from a familiar environment, disruption of routine etc. Although most of these early studies claimed to be studying the effects of maternal separation (Rutter 1974), they were in effect studying a much more complex set of disruptions and laying almost exclusive emphasis on one of them.

Experimental studies with non-human primates (Kaufman and Rosenblum 1967; Hinde, Spencer-Booth and Bruce 1965; Harlow and Harlow 1969) were able to tackle the issue of monotropy much more effectively because they were able to rear infants either alone with mother (thus studying the effects of group deprivation), or alone with group (thus studying the effect of maternal deprivation). Their most general conclusion was that both group and mother are important for normal infant development, since each form of deprivation led to different behavioural abnormalities.

In field studies of non-human primates there have been reports of gorilla infants forming strong attachments to females other than their mothers (Schaller 1963), and of siblings assuming the care of an infant after the mother's death, although not always successfully (van Lawick Goodall 1971; Rowell 1963)

Although care must be taken in assuming that the animal research has focussed on homologous behaviours (Hinde 1971a), these animal studies proved an invaluable supplement to the early separation studies in humans by demonstrating the dual importance of mother and group in promoting infant development. As regards the issue of monotropy, whilst there was direct evidence confirming the

importance of infant-mother bonds, there was also evidence that the broader social unit contributed significantly to infant development too, often affecting different aspects of infant behaviour. Neither could be considered of paramount importance. Thus Harlow and Harlow (1969) conclude :

"It is inappropriate to pit the importance of one of these attachment systems against the other."

In addition to these early empirical studies, several theoretical arguments could also be raised against monotropy.

First the "environment of evolutionary adaptedness" (Bowlby 1971) of human infants probably afforded access to a large range of familiar adults and peers (Bowlby 1971; Blurton Jones 1974), which would have given scope for several simultaneous attachment bonds. Anthropological studies of kinship suggest that terms like 'mother' may be used to refer to two or more relatives, who interact with the child in a similar manner (Krige 1965; Stephens 1963). Mead (1962) points to the ironic possibility that monotropy comprises a modern rather than a primitive feature of human behaviour, since it is only in recent times that mother-child pairs have been able to survive alone for long periods.

Second, it has been asserted that

"there is room for doubt whether creatures with such rigid developmental requirements [as those imposed by monotropy] could be capable of social behaviour of the flexibility and diversity shown by homo sapiens. It would indeed

militate against the building and transmission of culture to possess such a rigid preference for a relationship restricted to one individual" (Morgan 1975).

These two theoretical arguments can be countered however. Bowlby viewed monotropy as shortlived, disappearing in the child's third year of life , and therefore not incompatible with social flexibility later on. In this connection, Mead (1954) and Konner (1972) have suggested that monotropy may have some adaptive significance for later relationships in facilitating long-term bonding between males and females.

A third theoretical point relates to Bowlby's postulation that the simple social signals directed by young infants to their mothers (eg. smiling, crying, clinging) provide powerful reinforcers for the mother's attachment to her child, thereby ensuring the child's continued nurturance and protection. In the environment of evolutionary adaptedness, the division of labour meant that males assumed considerable responsibility for the nurturance of young (Caspari 1972; Rypma 1976). Therefore, these reinforcers may have been important for adult males too. It may also be important for females other than the mother to feel some attachment towards the infant, since there is evidence amongst hunter-gatherers like the Malapantaram of India (Whiten pers. comm.) and amongst less primitive peoples like the Samoans (Mead 1962) of shared breastfeeding.

In connection with these two points about the importance of the broader social unit for human infants, and bolstered by the non-human research previously discussed, it is possible that the adaptive significance of monotropy might be greatest in species where no stable social group exists to protect and nurture the young. Thus monotropy - in the more instinctive form of imprinting - is clearly evident in many bird species eg. geese. However the existence of a large stable group in human societies need not negate the adaptive significance of monotropy.

However, ultimate assessments of monotropy could not rest with the evidence of poor quality separation studies, indirect evidence from non-human primate work, and theoretical speculation. More direct evidence was required.

The form this has taken has been the comparison of children's attachments to their mothers and other familiar adults. Studies have generally compared mother-child with father-child attachments and have taken place in experimental and home settings.

Experimental studies have largely focussed on quantitative comparisons ie. how much attachment is shown to each parent when the child is with one or both parents. The detailed results have not been conclusive, although the majority of studies have not found substantial evidence of monotropy. Willemsen et al (1974), Kotelchuck (1973), Ross et al (1975) and Lamb (1976b) all report no differences in attachment behaviours shown to mothers and fathers. Cohen and Campos (1974) however, found 10% of their sample were

monotropic, the remainder seeking more proximity to mother than father. Lamb(1977a) also reports mothers being sought more often although only under stress conditions. Similarly, Lewis (1972) divided attachment behaviours into those thought to signify strong attachment (these were labelled 'proximal' attachment behaviours and included touching and proximity seeking), and those signifying weak attachment ('distal' attachment behaviours and including talking, looking and smiling) He found more proximal indices were directed towards mothers, thus giving evidence of a stronger attachment to her. However, Tracy et al (1974) report children seeking to be picked up more by father than mother.

Home studies have been marginally more conclusive in their overall results. Early studies relied on mother's reports of children's attachments. Pedersen and Robson (1969) for example report that the majority of their sample of eight-month olds showed close attachments to their fathers. Schaffer and Emerson (1964) found 29 % of their sample exhibited their first attachments to more than one adult, with 10% of them showing their first attachment to 5 or more adults simultaneously.

These early home studies later gave way to more sophisticated research in which fathers and mothers were observed interacting with their children, and differences in children's proximity seeking, separation protest ,etc. were examined .Both Lamb (1977a) and Clarke-Stewart(1978) report no difference between attachment behaviours displayed towards mother and father. Lytton (1976) however, reports 2 year old boys seeking closeness to mother more

often than to father, although Lewis and Weinraub (1974) report the opposite for a mixed-sex group of the same age ie. more proximity was sought to father.

Taken together these laboratory and home-based studies may lack unanimity in the finer aspects of children's attachment behaviours, but they are clearly consistent in reporting little evidence of monotropy.

Can it therefore be said that monotropy is an obsolete concept? Several people have been kind enough to comment on the present chapter, and one of the criticisms levelled at it was that it was merely setting up a straw man in order to knock it down (Henzi , pers. comm.). Whilst I have every sympathy with this criticism, two points ought to be made .First my emphasising the fact that research has failed in the main to provide support for monotropy does not imply that I am unaware of what this concept has contributed to our knowledge of children's social relations. It has given enormous impetus to research, but more especially it has encouraged developmental psychologists to think more in terms of the biological adaptedness of infant behaviour. Second, my coverage of this area should not be taken to imply that I believe monotropy to be an obsolete concept. I have genuine misgivings as to whether it has been satisfactorily disproved, despite the fact that so many studies have failed to find evidence for it. No amount of laboratory or home-based evidence from Western families can gainsay the evolutionary sense that monotropy makes for the hunter-gatherer societies to which infants are adapted. Born more helpless than

almost any other species, the selective advantages of behaviours which ensure a firm and unwavering bond between an infant and its mother should not be underestimated. Rutter (1974) too believes the issue remains unsettled and requires further study; Dunn (1977) similarly believes that a great deal more knowledge is required about the range of attachments children have before monotropy can be properly evaluated. Also there may be remnants of monotropy still evident in the thinking that has guided recent developmental research, most especially in the strong emphasis that is laid on mother-child relationships. It could be said that this emphasis results more from the fact that mother-child interaction occurs so often and is thus assumed to be most important, although this may be a questionable assumption since frequency of interaction is not a good predictor of children's attachments (Schaffer and Emerson 1964; Rogers 1977b). Perhaps there is still some implicit belief that mother-child relations are of greater significance than other adult-child relations, and perhaps too there is some justification for this. Certainly, it is my belief that the issue remains a potent one demanding more extensive investigation.

More modern research into attachment does not reflect this view though, since studies have moved away from the empirical assessment of monotropy. There is now interest in the relation between attachment and children's long-term development, with a secure attachment bond or bonds being associated with more optimal development (Ainsworth and Bell 1974; Main and Weston 1980). Attachment has ceased to be synonymous with a special relationship

between child and principle caretaker, being regarded instead as a subset of broader social relations (Hinde 1979). It is no longer used as a means of separating one adult-child relationship from another, but rather as a complex motivational or organisational construct which may be evident in several adult-child relationships at once. This is not incompatible with Bowlby's early formulation of monotropy in which it was thought to give way to a larger subset of attachment relations when the child was between 3 and 4 years old. But the concept of a developmental sequence in which one exclusive attachment bond develops first and other bonds later remains an open question.

2. Studies of children's social interaction with familiar adults.

To a large extent, the rationale that led to the development of this second approach to the comparative assessment of children with familiar adults evolved out of attachment research. Indeed some of the earlier studies of social interaction were aimed primarily at shedding new light on the significance of attachment bonds (Ainsworth and Bell 1974), rather than being an independent line of research. The attachment studies had shown few differences in children's bonds with mothers and fathers, despite there being a considerable difference in the amount of time children spent with the two parents. This gave insight into the mechanisms by which attachments were formed, suggesting that quality rather than quantity of interaction was the salient feature. This naturally led on to research into the content of children's social interactions with familiar adults, in which qualitative assessments of content

and style could be made.

At first, this did not stimulate the development of more interactive measures ,largely because the majority of studies took their measures directly from the attachment literature. In a few of these, distinctions had been made between strongly motivated attachment seeking (maintaining proximity, separation protest etc.) and weaker, more affiliative behaviours (smiling, looking, vocalising). Since there had been some evidence that mothers were preferred targets for attachment, and fathers preferred targets for affiliation (Lewis 1972; Lamb 1976a), it was hypothesised that children sought each parent for different reasons - mothers were sought for comfort and security, fathers for play and stimulation. The most obvious means of testing this lay in broad-based assessments of children's interactions with mother and father, in which there was ample opportunity for a range of interactional contents.

Little was achieved using these attachment-based categories. However, alternatives were not easily found. Some studies made use of disparate measures based on gross physical or motor elements of behaviour. Pakizegi (1975) for example, measured vocalisations, toy contact and smiles. Vandell (1977) focussed on the frequency and length of interaction bouts, who initiated and broke a bout, and motor behaviour. Neither of these reported any differences between children's interaction with mother and father. There is some doubt though as to whether this was because no differences existed, or because the categories used were insensitive to them.

That more complex and unitary analyses of interaction have proved more sensitive to differences is illustrated by Rubinstein et al's study (1977). They compared children's interaction with mother and other familiar adults who acted as babysitters while the mother worked. Simplistic categories (eg. the number of vocalisations and looks directed by the child to the adult) failed to show any differences in interaction. However, mothers were found to express more positive affect, indulge in more social play, and provide more variations in physical stimulation.

Several other studies which have used complex categories to compare mother and father interacting with their child have also reported differences in style, mostly in that father-child interaction is more playful and physical, whilst mother-child interaction is more sedentary and intellectual (Lynn and Cross 1974; Clarke-Stewart 1978). Nevertheless Belsky (1981) emphasises that differences in interaction are far outweighed by similarities in these studies. In addition, a study by Field (1978) suggests that differences between mothers and fathers interacting with children result largely from their different degrees of familiarity with the child, rather than from any intrinsic differences in their roles - thus fathers who were primary caretakers were markedly more like mothers in their interaction patterns. Similarly Rubinstein et al (1977) report substitute caregivers becoming more like mothers in their responsiveness to a child as the amount of contact they had with the child increased.

Still more fine-grained studies in which the cognitive content of

interaction is broken down into numerous functional categories (eg. Whiten et al 1979) or in which speech is coded in terms of teaching strategy, child-centredness etc.(eg. Wood et al 1980; Sylva, Roy and Painter 1980) have also proved extremely illuminating as regards different styles of interaction between adults and children.

It could be argued that this approach has added substantially more to our knowledge of adult-child interchange than studies on attachment. One reason for this is that their focus is less monadic - attachment studies had looked almost exclusively at the child's behaviour. In the broader study of children's social behaviour, some attempt has been made to gather equal amounts of data on the contribution of both partners. This pays dividends in that it allows for statements about the origins of differences in interactions. Thus, many studies report that what differences there are between mother-child and father-child interaction are largely due to the parent(Lamb 1977b; Clarke-Stewart 1978; Belsky 1979).

However it remains in doubt as to whether this approach does full justice to the complexity of interaction. Effectively it defines children's interaction with an adult in terms of two monads - thus the abovementioned distinction between the contribution of parent and child. Part of this problem stems from the use of category systems which lend themselves to such simplistic analysis (eg. vocalisation is easily broken down into adult speaks and child speaks). Another difficulty lies in the simplicity of analysis, in which straightforward comparisons of frequencies are made. It is

doubtful whether the real content of interaction can be captured in this way (Hinde and Hermann 1977). What is required is a new order of category system in which truly dyadic measures are made use of (eg. responsiveness, sequencing and synchrony of signals etc), and/or in which use is made of more sophisticated statistical procedures.

Thus there is considerable evidence that the move towards more complex measures of interaction pays dividends in highlighting differences in adult-child interaction, although there is still a great deal of scope for development.

The problems which lie in using overly simplistic categories for assessing interaction are perhaps clearest in one particular area of adult-child interaction : the study of second-order effects. These were first studied in 1973 by Parke and O'Leary and have been described as:

"..reductions in parent-infant interaction associated with the presence of a second parent." (Belsky 1981).

This description is based on the work of several investigators all of whom report more interaction between parent and child when they are alone together than when they are with the other parent (Pedersen et al 1978; Lamb 1976b; Belsky 1979; Clarke-Stewart 1978; Lamb 1977b). This effect has been attributed to changes in parental behaviour, in which parents respond to the limited attentional and interactional competence of their child by keeping the rates of interaction constant across different group sizes (Belsky 1979). Through comparing mother-child dyads with mother-father-child

triads, statements have been made about the nature of fathers' influence on children. Both Clarke-Stewart (1978) and Lewis and Weinraub (1976) believe this to be an indirect influence : father influencing mother influencing child.

A fundamental shortcoming of this work is evident from Belsky's description. Triadic settings are analysed in terms of mothers and fathers making separable contributions to the child's social experience. It is doubtful whether a mother-father-child triad can be meaningfully reduced to its mother-child and father-child components. It may also lead to misleading conclusions, as in the assumption that adding a second parent will reduce interaction. Here two points must be borne in mind. First, there is no reduction in the total amount of interaction the child is involved in (Belsky 1979), sometimes even an increase (Lamb 1976b). Second there will be a substantial increase in the potential for more complex forms of interaction in triadic settings. Triadic relations involve much more than the effect a third party has on dyadic interaction (Hinde 1971b), and by focussing narrowly on the second order effect, reports present a misleading picture in which triads seem synonymous with less interaction.

In a sense, then, this work has only compounded the flaws of previously mentioned studies of social relations in that it reduces both dyadic and triadic settings to a monadic analysis of each partner's contribution.

Nevertheless the study of how interaction as a whole is affected by

the introduction of a third person is a promising field. It has substantial ecological validity, in that many studies suggest that children have two or more adults simultaneously available for interaction in their home (Clarke-Stewart 1978; Schaffer & Emerson 1964; Newson and Newson 1968); also in that it has potential for dealing with the complexity of family interaction, in which parent-child and husband-wife systems are intertwined (Belsky 1981).

As regards the current status of this second strategy for studying adult-child relations, there is still much to be learned, most immediately about how to categorise interaction without losing its richness. The comparative study of dyads and triads stands out as particularly promising in this respect. Despite the simplistic nature of research into this so far, Pedersen et al(1978), Parke et al (1979) and Belsky (1981) have presented more complex theoretical models of triadic interaction with the aim of guiding further research. Such models may provide a powerful impetus to the development of more complex systems of categorisation.

CHAPTER 3 : SELECTING BEHAVIOUR CATEGORIES FOR THE PRESENT STUDY

Few studies of social behaviour provide detailed justification for their selection of behaviour categories (Hartup 1979), despite the fact that this selection can have a marked effect on results (Dunbar 1976). The previous chapter illustrates that a large range of measures were available, pointing clearly to the importance of choosing carefully between them. For the present study, the two most important constraints were that categories had to be easily observable in the field, and applicable to a broad age-range of children.

Since the more traditional approach to studying children's interactions with familiar adults has been to study their attachments to them, this was the first strategy considered. Perhaps its most attractive feature was that it would have narrowed the study's focus - as with most comparative field work, there is a danger of vast amounts of data being collected across numerous variables, but with little direction or purpose (Caldwell 1969). A tighter focus would have reduced this risk.

However, many practical and theoretical problems had become evident in previous attachment studies. The fundamental problem revolved around the issue of whether the behaviours used to measure attachment were doing so successfully. One of the fundamental premises of attachment behaviours is that they are "discriminating and specific" (Ainsworth 1973). This refers to the fact that

children's behaviour towards attachment figures should be different from behaviour towards others. For some this was seen in terms of behaviours which were directed exclusively to the attachment figure eg. pointing (Anderson 1972a; Blurton Jones and Leach 1972), and proximity seeking (Ainsworth 1967). However, extensive use of these measures in research failed to confirm this exclusivity. Children's pointing, for example, has been observed in their interactions with siblings, visitors to the home, and observers (Rheingold et al 1976). Children may follow their mother or a stranger with equal likelihood (Hay 1977). Rosenthal (1967) reports proximity seeking behaviours being directed as much to a stranger in the absence of mother, as to mother.

More recent work has moved away from this conception of attachment as a unique set of behaviours to more quantitative distinctions. Corter(1974), for example defines attachment as:

"the behaviours that increase or maintain proximity between infant and mother... they are selective in that they are controlled more by the mother or attachment object than by other people" (my underlining).

However, the validity of this distinction can also be questioned. Monahan(1975) for example reports that children exhibit more proximity seeking and maintenance towards strangers than mothers. Masters and Wellman (1974) report little consistency in these quantitative measures when the same child's behaviour is compared across time - even when observations are only three minutes apart.

It has, then, proved difficult to devise reliable and replicable

measures of attachment. Three reasons can be suggested for this. First, some of the behaviours singled out as indicative of attachment can also be indicative of quite different motivational constructs (Sroufe and Waters 1977). Rheingold (1973) for example, found children's proximity seeking increased at the end of observation sessions. This was almost certainly the result of boredom after 20 minutes in a laboratory playroom that contained only 4 toys. Willemsen et al (1974) similarly report more 'attachment' behaviours when children have less interesting toys to play with. Rubinstein and Howes (1976) postulate that the increase at 18 months in children's bids for maternal attention may represent an increased readiness for social interaction during play rather than an intensification of emotional conflict. Cohen and Campos (1974) speculate that children's crying and distress at separation was greatly affected by how fatigued they were at the time. Fleener and Cairns (1970) report the conditional probability of an infant's crying on separation trial n , given that they were crying on trial $n - 1$ was .87, regardless of who was departing. Falender and Mehrabian (1974) speculate that the infant's distress on being left alone in a strange room may reflect his dislike of the room rather than his desire to be with mother.

Clearly more attention will have to be paid to the behavioural and environmental context in which these behaviours are exhibited before they can be exclusively defined in terms of an attachment motive. Although the importance of context was mentioned fairly early on in attachment research (Tracy et al 1976), few substantial attempts have been made to discriminate the effects of context from the

effects of an attachment motive.

Thus, the same behaviours may express different motives. The second difficulty arises from the reverse of this : the attachment motive may be expressed through different behaviours at different times, with many individual differences. Bowlby anticipated this in his conception of attachment as a control system which could achieve its goal "by versatile means" (Bowlby 1971), and research has since confirmed the extent of this versatility. As regards attachment being expressed differently at different times, Lewis and Weinraub (1974) and Rendina (1976) report marked developmental changes in attachment behaviours between the ages of 1 and 2, with proximal forms (touch, seeking and maintaining proximity) giving way to distal forms (smiling, vocalising). This means that measures of attachment must be made age-specific, which presents formidable difficulties for studies like the present one in which children's ages range from 5 to 70 months. As regards individual differences, Rheingold (1969) for example reports that as many as 33% of children do not greet their mothers on reunion, although they show other indices of normal attachment. Cohen and Campos (1974) report that 50 % of their sample did not cry on separation from mother, father or stranger.

Related to this is Suomi's (1977) finding that infant rhesus monkeys exhibit different attachment behaviours towards different group members. Thus attachment to adult males is reflected in the infants' passive observation of them; attachment to mother is reflected in maintenance of ventral contact; attachment to peers is reflected in play. In the present study in which comparisons are to be made

between childrens' relationships with several very different caretakers (mother, father, grandmother, nanny, peer's mother), a similar phenomenon might occur. However, since there are no attachment studies which make such broad comparisons, it is difficult to ensure that categories appropriate to this wide range of relationships are included.

Third, attachment behaviours may be extremely situation-sensitive, a possibility which Bowlby anticipated (Bowlby 1971). Anderson (1972a) gives support for this possibility in reporting that a child's tendency to touch and seek proximity to mother altered radically according to whether she was sitting or lying on the grass. Fein (1975) found that the degree to which a stranger interacted with mother significantly affected the infant's distance from mother, vocalisation to mother, and touching mother. Studies may therefore have been inconsistent for no other reason than that they used subtly different procedures. Lewis and Weinraub (1974) suggest that the length of experimental session, size of room, toys present, and social class of parent-child pair have varied across different studies and may all have contributed to the inconsistency of results.

It should be said at this juncture that the difficulties in measuring attachment do not stem from the inadequacies of Bowlby's theory. As has been mentioned, his concept of attachment as a dynamic behaviour system predicted many of these difficulties, a point also made by Hinde (1982). In this sense, his theory should

have pointed research away from the fairly conservative and atomistic laboratory studies which became the norm. The problems, then, originate in the design of empirical tests not in the theory itself.

Sroufe and Waters (1977) have written a constructively critical review of these traditional approaches to measuring attachment. They suggest a new approach in which quantification of discrete measures is abandoned, with a new emphasis being placed on attachment as an organisational construct. Thereby, discrete units are grouped into larger constructs of avoidance, resistance, proximity seeking, contact maintaining behaviours; it is the patterning of these constructs across different contexts and over a developmental span which is focussed on. This approach was first mentioned by Lewis (1971), and Ainsworth (1972), but took a long time to achieve recognition. It caters well for the problem of different behaviours being used to express attachment at different times by subsuming them into an equivalent construct. Also, it caters for the problem of the same behaviour being used to express different motives by confining attachment behaviours to those exhibited in specific contexts. This more complex approach has had some success (Ainsworth et al 1977; Waters 1978), both in discriminating securely attached from insecurely attached children, and in predicting the development of attachment behaviours over time.

However, it demands extensive observation of the same caretaker-child pair across time and across different (preferably controlled) settings. Thus it may be of limited use in a playground setting like

the one used in the present study. Also, such a design has been used so far to study individual differences in children's attachment behaviours towards mother. How sensitive it would be in discriminating children's attachments to different caretaker types remains uncertain. Two points are important here. First, this approach relies largely on the same discrete units as the traditional approach to attachment measurement - the difference lying in how these units are then grouped together. Second, and again in common with the traditional approach, the emphasis is on the child's behaviour towards mother. Here there is a risk of research being more sensitive to differences in children's social dispositions or temperaments, than to differences in the quality of a relationship. If a child is 'anxiously attached', the repercussions this may have on mother-child relations versus father-child relations may be very different as a result of mother and father responding to anxious attachment in different ways. The child's expression of attachment behaviours may remain relatively constant with different caretakers, but this may still result in a different relationship with them. This new and more complex approach to mother-child attachment might thus meet with as limited a success in describing different adult-child relationships as has the traditional approach.

It seems, then, that the attempt to discriminate differences in children's relationships with adults on the basis of either qualitative or quantitative uniqueness in attachments has met with only limited success. In the more constrained setting of experimental playrooms where standardised separations/reunions and

interactions with strangers can be arranged these measures have had only partial success. In a study like the present one, however, in which no such standardisation is possible, in which little attention could be paid to subtleties of context or content of interaction, and in which attempts will be made to discriminate differences in children's relations with adults that have not been focussed on in attachment studies, their discriminative power may be minimal.

Categories were therefore sought from the broader studies of social interaction. Here, as was mentioned in CHAPTER 2, the measures with greatest sensitivity to differences in adult-child interactions were the more complex ones. This posed problems for the present study in that most of these categories were unsuitable for field work.

A compromise was therefore sought - a broad range of social measures were used, none of which were age-specific, although none of them allowing for very complex levels of differentiation. Taken as a whole though, it was hoped they would have comparable discriminative power. The net was cast wide rather than deep. In addition, wherever possible, categories were modelled on the more complex ones that had paid dividends in other studies of social interaction, especially in comparative studies of adult-child interaction.

One of the most important aspects of social relationships revolves around who is responsible for initiating and breaking contacts (Hinde and Atkinson 1970). This variable has been used extensively in non-human primate research (eg. Altmann 1980), but only rarely with children (Wenar 1978). However, an attempt was made to record

all clear-cut instances of initiation and breaking of contact between the child and his caretaker/s. It was hoped that this would provide some indication as to the relative contributions of adult and child to their interaction. In analysis these categories were expressed both as rates per sample and as ratios (ie. child initiations:adult initiations, and child breaks:adult breaks), ratios being found to produce a richer and more accurate reflection of relationships (Hinde and Atkinson 1970; Hinde and Herrman 1977).

Several variables were included to capture the general style or content of interaction. First, distinctions were made on the basis of predominant communication mode (whether interaction was predominantly visual, vocal or tactile). Despite the fact that other comparative work has failed to find much discriminative power in measures like these, they were included for two reasons. First, they were felt to comprise a fundamental element of interaction so that their inclusion was important for purely descriptive purposes. Second, most of the studies have used these measures in comparing mother-child with father-child interaction, whereas the present study aimed to make several other comparisons as well. It was possible that their discriminative potential would be different in comparing a broader range of adult-child interactions.

More general measures of content were incorporated too. For example, the amount of time spent cooperating with others, time spent being aggressive or threatening, time spent in apprehensive behaviours.

Children in the playground usually had a range of people to interact

with, not just their caretakers - eg. familiar peers, siblings, unfamiliar children and unfamiliar adults. The direction of all social behaviours was noted in order that the relative predominance of caretaker-child interaction could be assessed for children accompanied by different caretaker types. Direction was divided into caretaker only, caretaker plus others, or other only, which made it possible to examine whether the effects of caretaker type were confined to interaction between caretaker and child, or were more extensive. Time spent in solitary behaviour was also recorded.

It was hypothesised that the child's relationship with the caretaker might also affect his use of the playground. This was based on studies which had found mothers preferring nonsocial and intellectual activities when interacting with their children, whereas fathers preferred social and physical activities (Parke and O'Leary 1976; Clarke-Stewart 1978). With this in mind, the amount of time children spent playing on the various pieces of playground apparatus was recorded, in addition to the amount of time they spent in purely social activity, and time they spent unoccupied.

Apart from the categories of initiations and breaks of contact, no attempt was made to distinguish the relative contributions of the partners in an interaction sequence since this required more detailed observations of turntaking than was feasible in the playground.

Thus, the variables used in the present study are based on a broad range of behaviours drawn where possible from previous comparative

studies of adult-child interaction, and doing as much justice as possible to the complexity of social interchange.

CHAPTER 4 : CHOOSING A TIME-SAMPLING TECHNIQUE

Aim

When the present study was being planned, it was clear that some form of time-sampling would have to be used to cope with the large quantity of data that was required. A review of the relevant literature in search of a suitable technique left a confusing picture - few of the studies were comparable with the planned study; few findings had been replicated ; several studies reported diametrically opposed findings. The most practical solution was to perform a quick empirical test of some time-sampling techniques, in order to assess their relative accuracy in representing the particular behaviours being focussed on in the present study.

Since observation sessions lasted for 2-3 hours at a stretch, a time-sample which was easy to use and which minimised observer fatigue was sought. The two considered most suitable were point sampling and one-zero sampling. Point samples score a behaviour if it is in process at the end of a specified interval; one-zero samples score a behaviour if it is observed during the specified interval, in which case a score of one is given regardless of how many times the behaviour occurred in that interval. Thus, what follows is an empirical assessment of how accurate point samples and one-zero samples are at representing the categories of behaviour which are used in the main study.

Introduction

In choosing a time-sampling technique to gather data, a balance is sought between representativeness and economy. No time-sample can be as accurate in representing behaviour as the continuous record, but up to ten times as much data can be collected through the use of time-sampling. In naturalistic studies like the one being reported here, there are so many uncontrolled variables that large amounts of data have to be collected to ensure reliability. In such instances the small loss of representativeness that a suitable time-sample entails would be well compensated for.

The origins of time-sampling techniques can be traced back to Olson(1929). What was then discussed as a simplistic research tool has now become a complex and issue-laden facet of research design. Nowadays researchers use an array of different techniques (eg. one-zero sampling, point-sampling, predominant interval sampling, whole interval sampling), coupled with a large variety in the length of sampling interval. Recent evaluations of time-sampling have been quick to emphasise the importance of tailoring a time-sample to suit the particular behaviour being studied in order to ensure its representativeness (Tyler 1979; Leger 1977; Dunbar 1976). For example, a one-zero sample taken every 60 seconds might provide a reliable estimate of frequency for behaviours characterised by short bouts interspaced with long bout intervals (eg. a child's visual monitoring of a caretaker during exploratory play, Anderson 1972a). However, for behaviours which continue over long periods and which recur very rapidly (eg. play activities in nursery school children,

Stodolsky 1974) , the same time-sample would prove inaccurate. Tyler's computer simulation of behaviours exhibiting different bout-length:bout-interval-length ratios makes this point very clearly, primarily because such simulations obviate the confounding effects of behaviour's natural variability. What research of this nature indicates is that one time-sampling procedure cannot be assumed to be as good as another in representing behaviour. However, despite the recent upsurge in evaluations of time-sampling techniques, there are still few clearly established trends with reference to which a researcher can make a confident choice of time-sampling procedure.

Two reasons can be given for this. First, in several papers which attempt to provide direct comparisons of time-sampling techniques, the comparisons are embedded in a much broader framework. For example, Dunbar(1976),in his attempt to develop an empirically validated measure of social interaction in the gelada baboon, tackles two distinguishable research issues simultaneously : what time-sample best represents social behaviour (one-zero or point samples), and what quantifiable behaviour best defines social relationships (frequency of social acts, or frequency of social contacts, or duration of interaction, or frequency of grooming, etc.). Similarly, Altmann's (1974) evaluation of time-sampling techniques (one-zero and point samples) is accompanied by similar evaluations of other forms of sampling (eg. event sampling, state sampling), and of descriptive techniques (eg. sociometric matrices, focal animal sampling, etc.).

Clearly when applied to the real world, time-sampling is

inextricably linked with the issues discussed by Dunbar and Altmann. However integrating empirical evaluations of time-sampling with other methodological issues makes it more difficult to extract the information relevant to time-sampling per se.

Second, the variety of procedures that have been used (see TABLE 2) makes it difficult to formulate any clearcut impressions. Tyler (1979) has suggested that this variety should be reduced in future research to avoid further confusion. However, the introduction of constraints would involve arbitrary decisions as to which procedures would be most valuable in the long run. It would seem more reasonable to assume that distinct trends will emerge despite the variations in procedure.

This assumption would seem justified on two counts. First, with respect to the range of sample lengths used in research, Baulu and Redmond(1978) report some different interval lengths as having equivalent representativeness for behaviours. Second, trends persist across widely different behaviour categories eg social vs. non-social behaviour (Leger, 1977, Rhine and Flanigon, 1978); infant caretaking versus dyadic play (McDowell 1973). Thus, although variety makes the understanding of trends more difficult, it would seem wiser to avoid tighter constraints in the hope that trends will emerge with the accumulation of research.

TABLE 2 : SOME STUDIES WHICH HAVE MADE EMPIRICAL EVALUATIONS OF TIME-SAMPLING TECHNIQUES.

AUTHORS	SPECIES STUDIED	CATEGORIES OF BEHAVIOUR	TIME SAMPLES	INTERVAL LENGTH
Dunbar (1976)	gelada baboon	No. social contacts No. social acts Grooming bouts Physical proximity	One-zero Point sample	5,15,30,60,120 15,30,60,120
Simpson & Simpson (1977)	rhesus monkey	Time near mother Time away from mother	One-zero Point sample	7.5,15,30,60 120,240,480 30
Leger (1977)	chimps	Individual behaviour eg. eating Social behaviour eg. grooming	One-zero Point sample	15,30,60,120 15,30,60,120
Rhine & Flanigon (1978)	stumptail macaques	Individual behaviour eg. eating Social behaviour eg. grooming	One-zero Point sample	30 30
Baulu & Redmond (1978)	rhesus monkey	Social behaviour	Point sample	5,10
McDowell (1973)	human infants	Maternal caretaking Dyadic interaction	Point sample	15
Tyler (1979)	autistic children	Stereotyped behaviour	One-zero Point sample Predominant action	15,30 15,30 15,30
Tyler (1979)	computer simulations	Unnamed	One-zero Point sample Predominant action	5,10,15,30,60

Method

Twenty 4-minute samples were gathered through continuous recording on audiotape. A ten second timer was superimposed on the audiotape at the time of observation. Commentary was focussed on the categories of behaviour that were used in the main study but with one exception : initiations and breaks of contact were not recorded. This was because it was impossible for more than one contact to be made and broken in a ten second interval - a contact was only considered broken if no further interaction occurred for approx 15 seconds or longer. Thus, initiations and breaks of contact were event sampled within each 4-minute observation, so testing for an appropriate time-sample was not relevant.

Four measurements were extracted from the tape-recorded observations:

a) frequency of interaction - the number of discrete instances in which a category of behaviour was observed.

b) duration of interaction - the number of seconds during which a category was observed

c) point samples - the number of times a behaviour was in process at the onset of a ten-second interval.

d) one-zero samples - the number of ten-second intervals during which a behaviour occurred once or more.

Point sample and one-zero estimates could then be correlated with duration and frequency to assess their comparative representativeness.

Across the twenty samples collected, most categories were observed quite frequently. However, two categories - visual interaction and tactile interaction - occurred in less than six of the twenty 4-minute samples. For these, 18 extra 4-minute samples were collected and analysed, so that their results were not based on too small an N.

Results

Pearson product-moment correlations were calculated between point samples and duration, one-zero samples and duration, point samples and frequency, one-zero samples and frequency. Results for correlations with duration are presented on TABLE 3. Results for correlations with frequency are presented on TABLE 4.

TABLE 3 : CORRELATIONS BETWEEN DURATION AND ONE-ZERO, DURATION AND SCAN.

CATEGORY	DURATION & ONE-ZERO	DURATION & POINT SAMPLE	N*
VISUAL INTERACTION	.97	.99	11
VOCAL INTERACTION	.99	.99	16
TACTILE INTERACTION	.90	.97	12
SOLITARY BEHAVIOUR	.98	.99	13
APPARATUS PLAY	.97	.97	16
SOCIAL PLAY	.94	.87	15
UNOCCUPIED	.97	.98	17

* the total number of 4-minute samples in which each behaviour category was observed at least once.

TABLE 4 : CORRELATIONS BETWEEN FREQUENCY AND ONE-ZERO, FREQUENCY AND SCAN.

CATEGORY	FREQ. & ONE-ZERO	FREQ. & POINT SAMPLE	N*
VISUAL INTERACTION	.55	.64	11
VOCAL INTERACTION	-.14	-.25	16
TACTILE INTERACTION	.42	.52	12
SOLITARY BEHAVIOUR	.12	.03	13
APPARATUS PLAY	.32	.29	16
SOCIAL PLAY	.39	.39	15
UNOCCUPIED	.58	.53	17

* the total number of 4-minute samples in which each behaviour category was observed once or more.

As regards duration, then, one-zero and point samples provide equally good representations.

As regards frequency, the results are far less encouraging. This concurs with the work of Tyler (1979) who found one-zero and point samples to correlate poorly with frequency of stereotyped behaviours in children. If either one-zero or point samples are to be used for statements about frequency, some form of correction factor will have to be applied eg. regression or implementation of Poisson distributions. Since the range of correlations across behaviour categories is so large, separate correction factors would need to be calculated for each category. In this case, it would be less time-consuming to measure frequency directly.

Discussion

The rationale behind a comparison like that reported here revolves around the assumption that duration and frequency provide the best baseline for one-zero and point sample scores to approximate. This assumption has recently been challenged by Rhine and Flanigon (1978). Their assertion is that, since most data is used for comparative purposes, two one-zero samples provide as meaningful a comparison as two duration counts.

Rhine and Flanigon's choice of one-zero samples as an example to prove their point is an unfortunate one. It has been repeatedly demonstrated that one-zero scores reflect a variable mixture of duration and frequency, with the exact mixture being determined by the interval length (Altmann 1974; Dunbar 1976; Kraemer 1979; Tyler 1979). This means that, in comparing two one-zero scores, one may really be comparing one score which reflects frequency with another score which reflects duration. For example, it has been reported that female preschoolers maintain social contacts through prolonged bouts of well-spaced interaction; males on the other hand, exhibit brief but more frequent bouts of interaction (Garvey 1977). By using two one-zero samples to measure interactions of this kind, one might well obscure very real sex differences through comparing an estimate reflecting high frequency with an estimate reflecting long duration.

For the present study then, it seems reasonable to use duration and frequency as suitable baselines.

A second methodological feature which merits discussion is the selection of a ten-second interval as the one most suitable for point sample and one-zero estimates. Many studies have demonstrated that a sample's accuracy increases as the interval lengths are shortened (Simpson & Simpson 1977; Dunbar 1976; Leger 1977; Tyler 1979). However, using extremely short intervals undermines the value of time sampling as an economical means of gathering data. A balance is therefore sought between economy and accuracy - in this case a ten-second interval length.

By comparison with most other evaluative studies (see TABLE 2), this is a relatively short interval length. This may help to explain the present study's finding that one-zero and point sample techniques correlated equally well with duration. Other reports have been unanimous in finding point samples more representative (Dunbar 1976; Simpson & Simpson 1977; Leger 1977; Baulu & Redmond 1978; Rhine & Flanigon 1978; Tyler 1979).

In addition, the bout-length:bout-interval-length ratio of the behaviours measured in the present study may have been particularly well suited to one-zero sampling (see TABLE 5). As has already been mentioned, one-zero reflects a variable combination of duration and frequency. Where the sample interval is small relative to the mean bout-length and mean bout-interval-length of behaviours, one-zero scores provide an estimate based predominantly on duration (Altmann, 1974; Kraemer 1979); this predominance is magnified by a short sample interval (Dunbar 1976). TABLE 5 indicates that this long bout:long bout-interval ratio best characterises the behaviour

categories in the current assessment.

TABLE 5 : MEAN BOUT-LENGTH AND MEAN BOUT-INTERVAL-LENGTH FOR CATEGORIES OF BEHAVIOUR.

CATEGORY	MEAN BOUT LENGTH	MEAN BOUT INTERVAL LENGTH
VISUAL INTERACTION	24.7	104.0
VOCAL INTERACTION	56.4	49.4
TACTILE INTERACTION	11.1	62.9
SOLITARY BEHAVIOUR	45.1	82.0
APPARATUS PLAY	79.5	19.8
SOCIAL PLAY	19.4	67.2

It appears therefore that the unusually high predictive values of one-zero scores are the combined result of a short interval length being used, and a peculiar ratio between behaviours and their non-occurrence.

In making a final choice, then, it was clear that time-sampling could only be used to represent duration. As regards the choice between one-zero and point sample techniques, there seemed little to choose between them. The choice, then, was made on the basis of personal preference - for one-zero scoring. This was because one-zero sampling was felt to be less tiring over the 2-3 hour observation periods. The same technique of making one-zero samples at ten-second intervals has been used extensively in other studies of children's social behaviour (Wahler 1967; Rheingold 1973; Clarke-Stewart 1973).

Thus each 4-minute focal child observation was divided into 24 ten-second time blocks, in each of which behaviours were coded according to the principles of one-zero sampling, with the resulting data being used to provide an estimate of duration.

5:1. The Research Venue

Observations were conducted in a large urban park playground in Durban, South Africa. The particular playground was chosen for two reasons :

a) the park itself was probably the most popular in Durban. In addition to the playground, other children's amenities included a well-stocked zoo with tame animals for children to feed, an outdoor restaurant specialising in exotic ice-creams, milkshakes etc., a pagoda in which children's parties were held, large areas of open space for running around, and a spectacular fountain. With this array of child-centred attractions, the park was almost always filled with children, which meant a plentiful supply of subjects in the playground.

b) the playground was the only multi-racial one in Durban, which allowed a broader range of children and caretakers to be sampled.

The playground itself was well equipped. It was sand-based so that very young children could crawl about freely. It was completely enclosed by a low railing with self-shutting gates so that children could not wander away unnoticed. Apparatus ranged from equipment designed for infants (eg. baby swings) to equipment designed for preschool and school-age children (eg. climbers, Wendy house etc.). Within the playground itself there were three slatted benches

for caretakers, and just outside the railings another five benches (see FIGURE 1).

5:2 How the Data was Collected

Observations were made on weekday mornings during school term-time. This was to ensure that only preschool children would be in the playground during observations. Early pilot work had suggested that the arrival of older more boisterous children after school made a marked difference to the preschoolers' behaviour - they retired to the outskirts of the playground, and spent long periods simply watching the older children. Fewer preschoolers came to the playground in the afternoon too, which made observation periods less fruitful. Some caretakers mentioned that they only came in the mornings, and never during school holidays, because the playground became too busy and play too vigorous after school hours.

The observer sat on one of the park benches inside the playground. Under a raincoat on the seat were two cassette recorders. One of these recorded the observer's speech. The other played a cassette pre-recorded with ten-second time signals. These were picked up by the first cassette recorder and thus superimposed onto the taped observation.

Each session of data collection lasted 2-3 hours, weather permitting. Within each session, observations took the form of 4-minute focal-child samples. During this time the child's behaviour

KEY

- 1. Slides
- 2. See-saws
- 3. Baby swings
- 4. Roundabout
- 5. Climber
- 6. Large swings
- 7. Wendy house
- 8. Blackboard
- 9. Gates to playground

10. Maypole

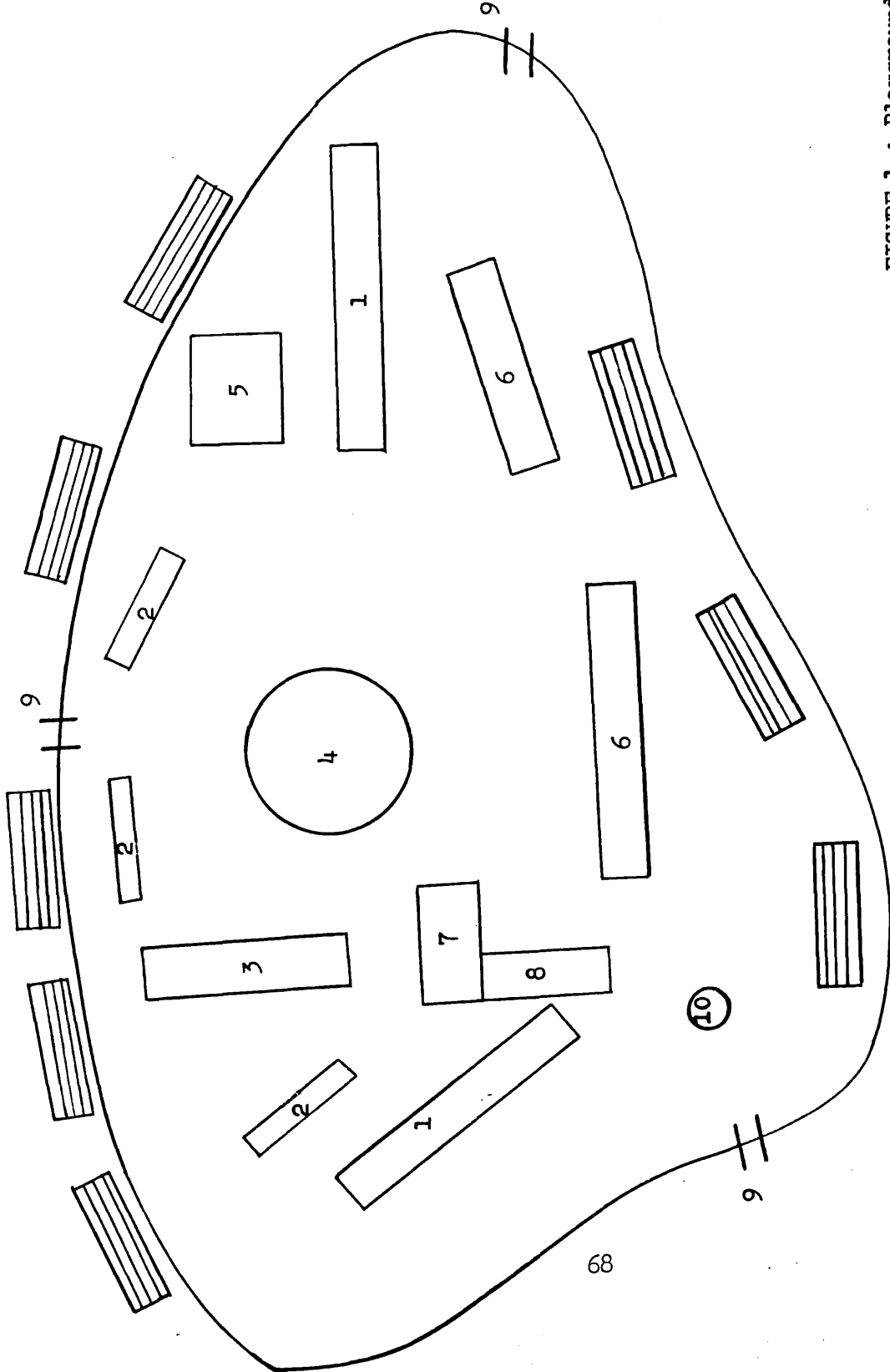


FIGURE 1 : Playground layout.

was continuously monitored. Descriptions took the form of predetermined categories (see SECTION 5:4). At the end of an observation session, the tapes were transcribed into one-zero scores per 10-second interval. These were recorded on checksheets (see APPENDIX 1).

5:3 Subjects

Subjects were selected at random from the children in the playground. It was fairly easy to establish which caretaker belonged to which child by keeping an eye on the gates through which children and caretakers entered the playground. This also made it easy to gauge when a group were about to leave. As they left caretakers of children who had been observed were approached and given a few details of the study. They were then asked if the observation/s already collected could be used. No caretaker refused. Information was then gathered as to the child's age, how often the child came to the playground, whether there were any other children in the child's family and if so how many, how often the child came to the playground, what area of the city the child lived in, and what relationship the caretaker/s was to the child (eg. mother, aunt etc.). At the start of a sample, the number of other children in the playground was noted, also the length of time the focal child had been in the playground. An estimate was made of the caretakers' ages after subject details had been gathered from them.

Most children were observed only once or twice in the study. A few however attended the playground almost daily, and so were observed

several times - these constitute a small minority though.

5:4 Categories of Behaviour

Four main aspects of child behaviour were focussed on. Within each there were several discrete categories of behaviour.

A. Activity

1. Apparatus play - the child is in active contact with playground apparatus. This category was sub-divided according to the type of apparatus being used:

- a) slide
- b) swing
- c) baby swing
- d) see-saw
- e) blackboard
- f) wendy house
- g) climbers
- h) roundabout
- i) child's own toys
- j) maypole
- k) sand

(see PHOTOGRAPHS 1, 2 and 6).

2. Social Play - child is in active social contact with a caretaker, peer, or unfamiliar person (see PHOTOGRAPHS 3 and 5).

3. Unoccupied - no observable involvement with apparatus or people

for 5 seconds or longer. Includes slow and undirected movement across playground (see PHOTOGRAPH 4).

The predominant activity of these three was coded. For example a child sitting motionless on a swing while his father sat next to him talking would be coded for 'social' rather than 'apparatus'. Thus, the three categories were treated as mutually exclusive.

B. Initiations and Breaks of Contact with Caretakers

These are defined in terms of who is responsible for an initiation or break - the child, the caretaker, or other (sibling, peer, unfamiliar child, unfamiliar adult). Initiations and breaks of contact are often very difficult to assess during field observations (Anderson 1972a; Beckwith 1972). There is no chance of re-running a sequence, and no opportunity for the detailed microanalysis which videorecording allows. A rough and ready decision has to be made, usually based on rather gross aspects of behaviour eg. who walks away first, who speaks first. Such techniques are problematic in that more subtle signals from one partner often precede more obvious signs from the other (Hinde and Atkinson 1970)- an eyebrow flash may invite contact (Argyle 1969), an averted gaze may communicate an unwillingness to prolong interaction further. Such signals are not always visible to a distant observer in the field. Therefore, in planning this aspect a choice had to be made between coding :

a) all contacts for initiation and break, using whatever signals could be picked up at the time.

b) only those contacts which were clearly initiated and/or broken by one partner.

The latter was chosen as the more reliable technique. This section thus refers to a small proportion of all initiations and breaks viz. those which were clearly marked. Breaks of contact were further restricted : no further interaction between child and partner could occur for approximately 15 seconds - this prevented brief interruptions being scored as breaks of contact.

Examples of initiations and breaks are as follows :the child is playing in the sand, looking down at it, and the mother approaches and picks him up (caretaker initiates); the mother is sitting on a bench knitting and the child runs up to her and clambers on her knee (child initiates); child walks away from mother and begins to talk to peer without maintaining visual or vocal contact with mother (child breaks).

C1. Direction of Social Behaviour

Social behaviours were divided into those directed towards:

a) caretaker - the adult/s accompanying the child to the playground (see PHOTOGRAPHS 2, 3 and 5).

b) other - all non-caretakers. These included siblings and peers accompanying the caretaker-child group, unfamiliar children and unfamiliar adults also in the playground (see PHOTOGRAPH 6).

c) caretaker + other - interaction with a) and b) (see PHOTOGRAPH 5).

C2. Mode of Social Behaviour

This referred to the channel of communication being used:

a) visual monitoring - child fixates another without attempting to engage in interaction with them.

b) visual interaction - this includes smiling, waving, gesturing and pointing. The overt visual signal may be emitted by the child or the partner. Some signals from partners are likely to have been missed, most particularly those which the child showed no awareness of, since the observer's attention was focussed primarily on the child rather than on potential partners (see PHOTOGRAPH 1).

c) vocal interaction - talking, nonsense sounds, crying etc. where these are specifically directed by the child to another person or vice versa. Whether a vocalisation was specifically directed was assessed according to context and direction of child's gaze (see PHOTOGRAPHS 2, 5 and 6).

d) touching - part of the child's body is in active physical contact with another person (see PHOTOGRAPH 3).

e) solitary - no observable interaction or visual monitoring (see PHOTOGRAPH 4).

As with Activity, mode was defined in terms of the predominant channel in use. Thus, a child who looked at his mother while talking with her was coded for 'vocal' only; a child who waved several times to his caretaker and accompanied one of the waves with a brief shout would be coded for 'visual' only. There were occasional overlaps in this system eg. child climbs onto mother's lap and sits being

cuddled for several seconds, they then begin to talk whilst still cuddling - theoretically this should be scored as 'touching' then 'vocal'. However, the cuddling is still an important element of the interaction. In such instances vocal and touching are scored simultaneously.

A difficulty arose with occasions in which the child was neither solitary nor socially involved - this is commonly referred to as parallel play (Parten 1932). Smith (1978) defines this as follows:

"the focal child has one or more other children who are in close proximity to him or her and are engaged in similar behaviours. However...their presence does not substantially affect his or her behaviour"

In the present study, instances of parallel play (eg. two children playing on the same slide and coordinating their activities only insofar as they take turns climbing the stairs and sliding down) were coded as parallel play but then omitted from all further analyses.

D. Content of Behaviour

This section aimed to describe some stylistic aspects of children's behaviour - not so much what they did, but how they did it. It was not intended as a unitary section like the others, since there were only a few rather diverse elements of style which were readily observable in the field.

a) cooperative interaction with caretaker - child is assisted by the caretaker in performing an activity which the child would have difficulty in performing alone. For example, caretaker pushes

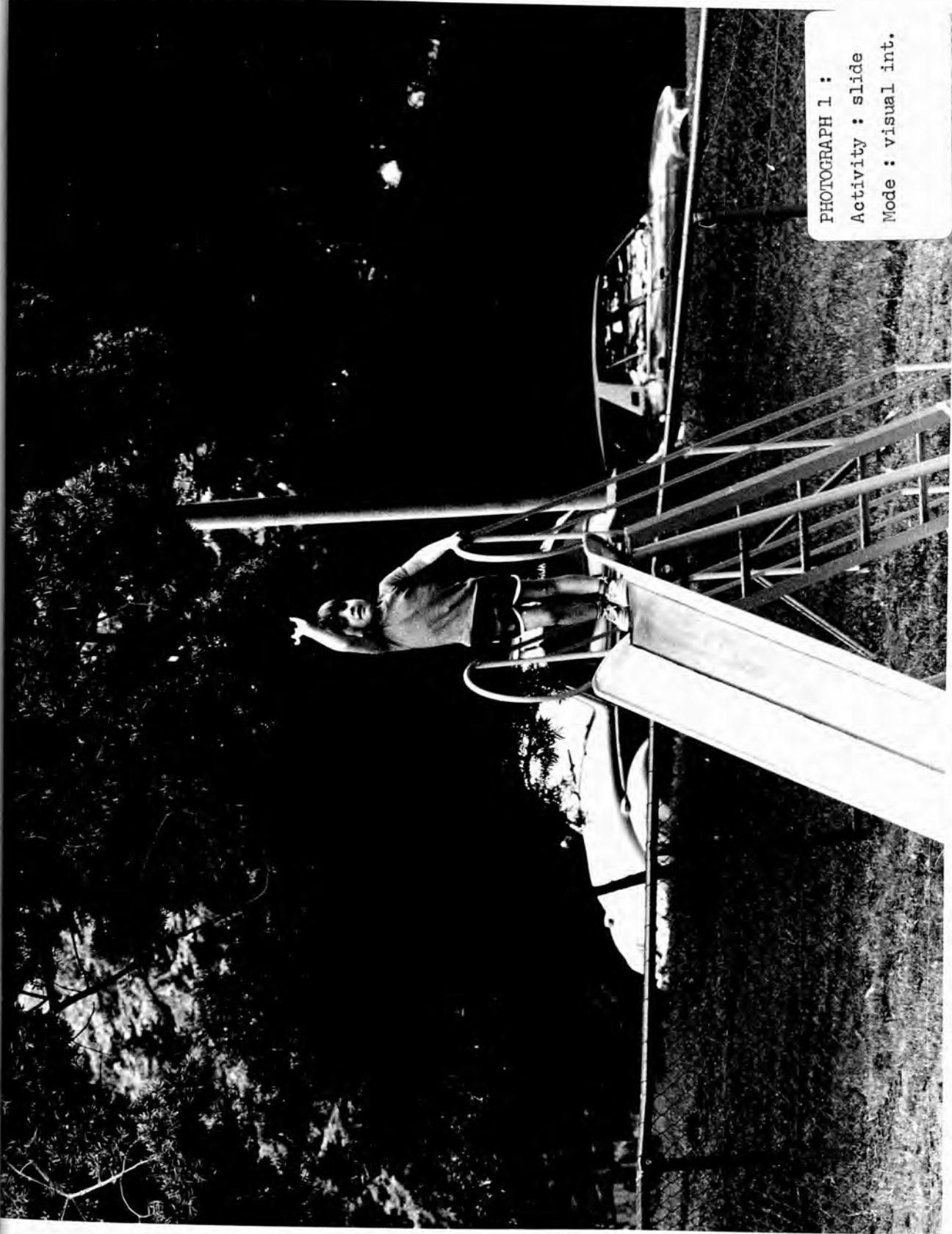
the child on swing; caretaker presses down the opposite side of seesaw; caretaker removes the child's shoes and socks (see PHOTOGRAPH 2).

The rest of the categories in this content section occurred very rarely, so they could only be incorporated into the simple ethograms contained in CHAPTER 7 and not into formal analyses. As a result, they are described here only briefly.

b) cooperative interaction with other - child is assisted by sibling, peer, unfamiliar child or unfamiliar adult in performing an activity which the child would have difficulty in performing alone.

c) apprehensive behaviour - sub-categories include chin in, hand to head, clothes fumbling without visual fixation, hand to mouth etc.

d) aggressive and threatening behaviour - sub-categories include kick, punch, hit, tug , hard stare etc.



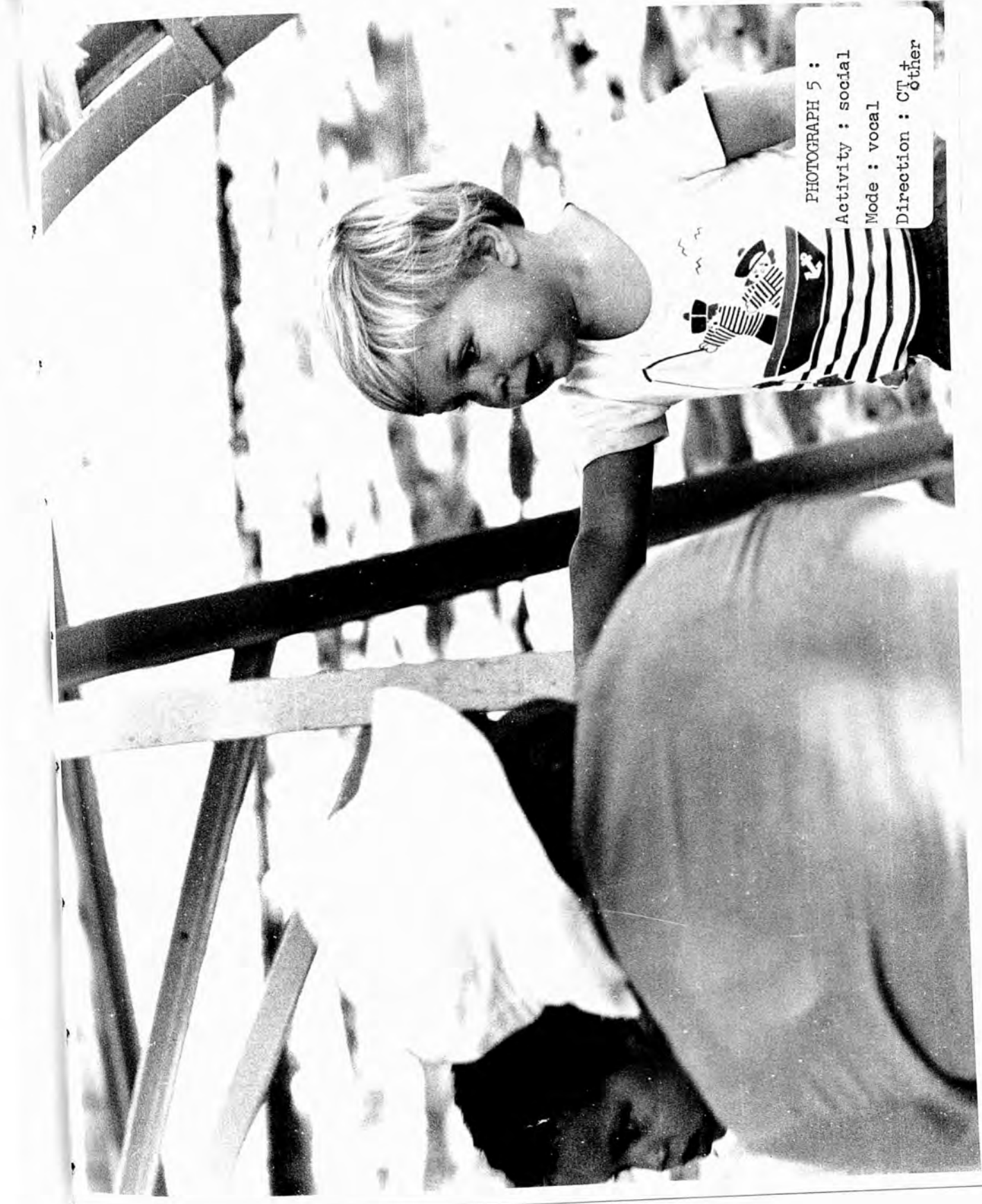
PHOTOGRAPH 1 :
Activity : slide
Mode : visual int.



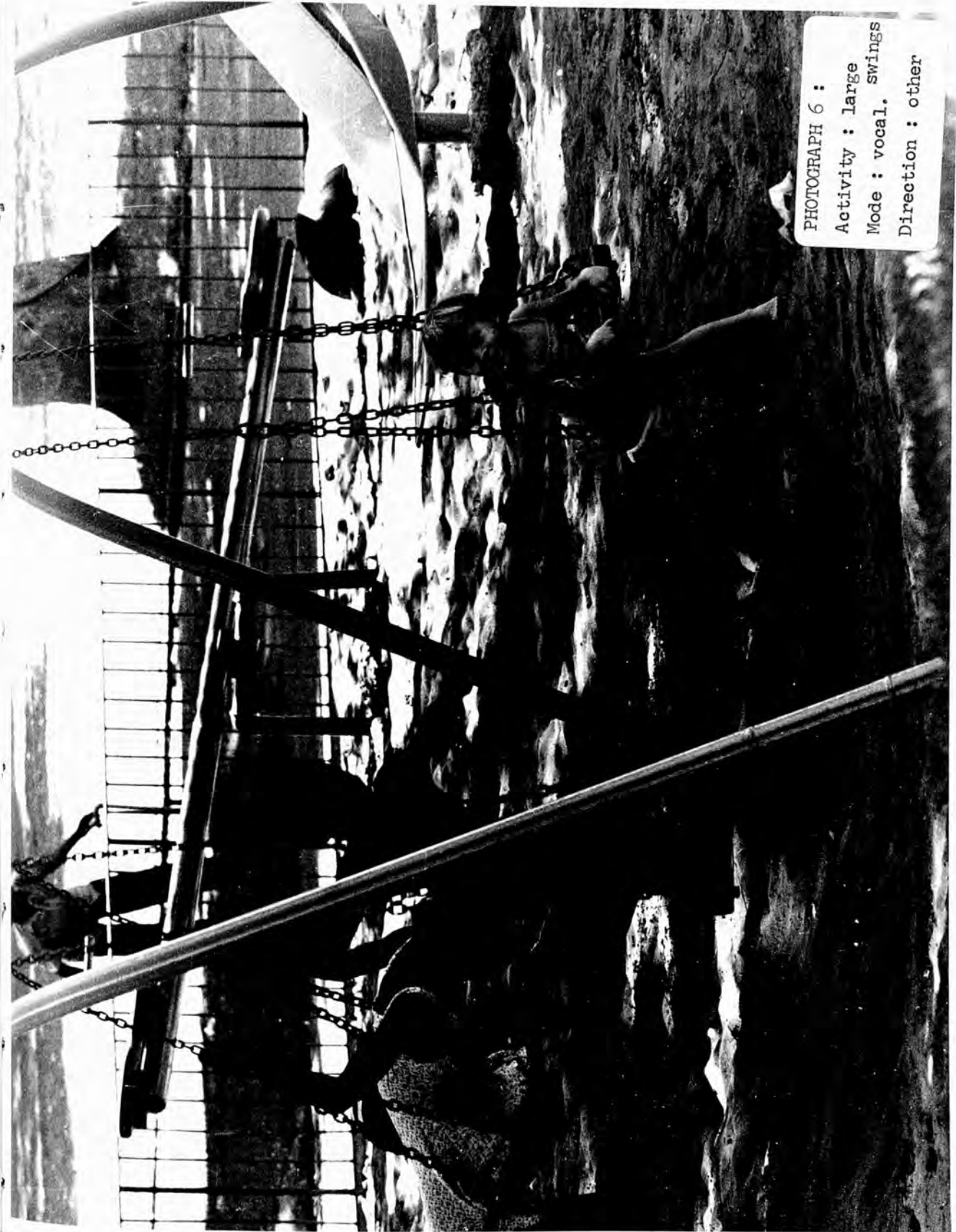
PHOTOGRAPH 2 :
Activity : large
Mode : vocal swing
Direction : CT
Content : cooperative



PHOTOGRAPH 3 :
Activity : social
Mode : touch
Direction : CT



PHOTOGRAPH 5 :
Activity : social
Mode : vocal
Direction : C^T + Other



PHOTOGRAPH 6 :
Activity : large
Mode : vocal. Swings
Direction : other

CHAPTER 6 : RELIABILITY

The conventional assessment of reliability revolves around whether two or more observers see the same behaviour occurring at the same time. For the purposes of the present study, this would have required the principle observer, plus a second observer who was experienced at coding several disparate and fine-grained categories simulataneously. At the time observations were being carried out, no one in the local university was involved in similar research, so a conventional assessment of reliability could not be made.

However, since data collection took place in two phases 18 months apart, a split-half test of reliability was done instead. This technique has both advantages and disadvantages when compared with inter-observer reliability tests. It is better in that it highlights any cumulative observer bias:- inter-observer tests are generally conducted early on in a study, after which the principle observer is left to collect data alone. Such a test is not sensitive to occasional biases becoming consolidated over time and leading to overall inaccuracy (Johnson and Bolstad 1973). In terms of the present study it is also advantageous in that it can evaluate the generalisability of findings - do significant differences in behaviour at one time still appear in the behaviour of other children 18 months later? In this sense a split-half reliability test assesses replicability as well as reliability. However, this also presents difficulties in that behaviour categories with low

reliability scores may be categories which are affected by:

a) observer bias

and/or b) environmental or temporal factors like seasonal changes
in temperature, changes in playground layout etc.

There is no way in which these two possibilities can be teased apart except through extensive analysis. In such cases, the safest option is to exclude such categories from further analyses, despite the fact that observer bias may not be the cause of a low reliability score. This results in a conservative estimate of reliability.

Although split-half reliability tests assume that observer bias in the first phase will not be carried across to the following phase, this assumption may sometimes be wrong. In the present study this was thought unlikely first because the two observation phases were so long apart, second because definitions of behaviour categories were predetermined and based on relatively gross aspects of physical behaviour rather than on subtler elements of social context. For example, visual communication with a caretaker was limited to events in which the child exhibited direct and prolonged visual fixation on the caretaker; breaks of contact were confined to instances in which one partner physically left the other or began interacting exclusively with another. Such a category system leaves little scope for interpretative bias.

The split-half technique was chosen, then, as a 'second-best' in the first instance, since no one was available for inter-observer reliability testing. However, in retrospect, it seems to have had just as much to recommend it. Neither technique can provide a

comprehensive assessment of all aspects of reliability, but each has unique advantages.

Statistical Procedure

Reliability was assessed for all categories of behaviour that occurred often enough to be included in the final analyses (ie. CHAPTERS 9 and 11). All the data used in these final analyses provided the data base for reliability testing - ie. 593 4-minute samples.

As mentioned in the last chapter, 4 different aspects of behaviour were looked at in this study : Activity, Initiations and Breaks of Contact, Direction and Mode of Social Behaviour, and Content. Each of these was sub-divided into several mutually exclusive categories of behaviour. Assessments of reliability took the form of Canonical correlations between the dichotomous 'halves' factor and the set of categories that made up each of the 4 different aspects of behaviour. This is precisely equivalent to a Multivariate Analysis of Variance between the two halves. The halves factor has only two levels, so there is only one Canonical correlation R^2 . This R^2 is identical to a conventional multiple regression R^2 for "predicting" the halves dichotomy from the set of behaviour categories, and the significance tests are performed in the same way too. This value tells how much of the difference between the two halves is attributable to the set of categories (Cohen and Cohen, 1975). It capitalises on differences between the two halves in the means of

each category, and also on the intercorrelations among the categories within the halves.

Thus, for each of the 4 aspects of behaviour, a canonical correlation was calculated between the halves factor and the set of behaviour categories. Thereafter a step-wise procedure was followed. Significance tests were made for each category individually. Where a category was found to have a significant effect on the halves dichotomy, it was removed from analysis and the Canonical correlation were re-calculated, this time including only those categories which did not affect the halves dichotomy.

One complication is involved here : in between the two phases of observation, the playground was changed by the local authorities - a climber and an extra see-saw were added, and the layout of apparatus was slightly altered .

Results

1. Activity Categories

Taking all categories of activity :

$$R^2 = .24 \quad f(7,592) = 2.36, p < .05.$$

Examination of the R^2 's for individual categories suggested that slide play was contributing heavily to this f -value. This was confirmed when the analysis was redone without slide play:

$$R^2 = .12 \quad f(6,592) = 1.388, N.S.$$

Omitting slide play from the set of activity categories then, afforded an acceptable level of split-half reliability.

2. Initiations and Breaks of Contact

$$R^2 = .14 \quad F(3,592) = 2.09, \text{ N.S.}$$

This meant that there was an acceptable level of split-half reliability for this set of categories.

3. Mode of Social Behaviour

$$R^2 = .65 \quad F(9,592) = 4.51, p < .001.$$

Examination of the individual R^2 suggested that visual to other and tactile to other were contributing heavily to the F-value. This was confirmed when they were removed and the analysis redone:

$$R^2 = .11 \quad F(7,592) = 0.954, \text{ N.S.}$$

Thus excluding these two rarely occurring categories from the analysis resulted in an acceptably high split-half reliability.

4. Cooperative Interaction with Caretaker

$$R^2 = .06 \quad F(1,592) = 3.46, \text{ N.S.}$$

Therefore an acceptable split-half reliability was found for this category.

Discussion

In all, three categories had to be removed from the analysis in order to achieve an acceptable level of split-half reliability. The two of these which fell in the 'Direction and Mode of Social Behaviour' aspect were rarely occurring categories anyway : visual to other had a mean rate of 1.70 per 4-minute sample, tactile to other a rate of 0.74. Therefore little was felt to be lost by their exclusion. However, the category which fell in the 'Activity' aspect

was somewhat more serious, since slide play was one of the more favoured forms of activity (mean rate of 4.08 per sample). Bearing in mind that activity is one of the most straightforward aspects of behaviour to code in the field, it was felt that the absence of split-half reliability was more likely to be a result of the playground alterations than poor observer reliability. As such it was decided to retain this activity in the set.

To conclude then, only two categories of behaviour, both in the 'Direction and Mode of Social Behaviour' aspect were excluded from further analysis on the basis of potentially low observer reliability.

In evaluating this method of reliability testing, it is important to mention in summary that it was ultimately inconclusive. This can be attributed to the design of reliability testing used in the present assessment, since a comparison of 2 phases of observation cannot isolate observer unreliability from other variables contributing to differences eg. seasonal or temporal differences, changes in playground layout etc. However since relatively few measures appear to differ significantly across the two phases of study, and since one of these seems likely to arise from changes in playground layout, it seems reasonable to assume that the observer maintained a consistent standard of observation and coding across the two phases of data-collection.

CHAPTER 7 : BACKGROUND DATA

SECTION 7:1 : CARETAKER TYPES ACCOMPANYING CHILDREN

This section details the number of 4-minute samples in which each caretaker type was observed accompanying a child to the playground, regardless of whether the caretaker was alone with the child, or with other caretakers as well.

When broken down into all the combinations of caretaker type that were observed (eg. mother with father, father with grandmother, grandmother with peer's mother etc.) the number of observations in each cell was too small to make detailed analyses possible. Consequently, the first set of analyses (ie. CHAPTER 9) is based on children who were accompanied by only one caretaker. The next analyses (ie. CHAPTER 11) compares this data with that for children accompanied by two caretakers. In each case, a limit of 18 4-minute samples per caretaker type was selected as the minimum number that would be handled statistically. Care was taken to ensure that only one 4-minute sample was collected from any one child.

TABLE 6: NUMBER OF 4 MINUTE SAMPLES IN WHICH EACH CARETAKER TYPE WAS OBSERVED - EITHER ALONE WITH CHILD OR IN COMBINATION WITH OTHER CARETAKERS.

CARETAKER TYPE	NUMBER OF SAMPLES
Mother	486
Grandmother	192
Nursery teacher	162
Father	128
Nanny	101
Peer's mother	69
Friend of mother	65
Grandfather	46
Aunt	30
Great grandmother	15
Uncle	14
Brother	12
Great Aunt	11
Next door neighbour	11
Peer's grandmother	9
Extended kin group	9
Peer's father	6
Peer's uncle	2
Peer's aunt	2
Peer's grandfather	1
No caretaker with child	10

SECTION 7:2 : ETHOGRAM : OVERALL RATES OF BEHAVIOUR CATEGORIES

This section aims to provide a general picture of children's play and social behaviour in the playground. In the following chapter the results will be compared with the findings from previous research done in nursery schools and at home, in order to evaluate the generalisability of current findings. This seems important in light of the fact that playgrounds have been so rarely used for research. The mean rates per 4-minute sample are based on all the samples that were used in the final analyses contained in CHAPTER 9 (ie. children accompanied by one caretaker), since these children are probably more directly comparable with the children observed in similar studies conducted in homes and nurseries.

Where child's sex or age, or the number of "peers " (see footnote) accompanying the caretaker child pair influenced the distribution of a category, this is detailed in the column labelled 'Characteristics'. APPENDIX 2B contains details of significant F-values for these categories. Details of all R^2 values for the main effects of caretaker type, age, sex and number of peers, as well as for their relevant interactions are contained in APPENDIX 2A. Since some of the behaviour categories were observed only rarely, the main effects of age, sex and number of peers were only tested for in the more frequently occurring categories.

'peers' is a shorthand term and includes all companions. Analysis revealed that 68% of these were the focal child's siblings

A. Activity

TABLE 7 : LINEAR ORDERING OF ACTIVITY CATEGORIES

APPARATUS	MEAN D _{rtn} PER 4 MIN. SAMPLE	CHARACTERISTICS
UNOCCUPIED	5.60	Decreases with age.
BABY SWINGS	5.22	-
SLIDES	4.08	-
ROUNDAABOUT	4.08	-
SOCIAL PLAY	3.94	-
SEESAWS	3.41	-
LARGE SWINGS	3.27	Decreases with age. More for females.
CLIMBERS	0.45	Rare category
SAND	0.41	Rare category
TOYS	0.30	Rare category
MAYPOLE	0.30	Rare category
HUT	0.14	Rare category
BLACKBOARD	0.07	Rare category

See also FIGURE 2.

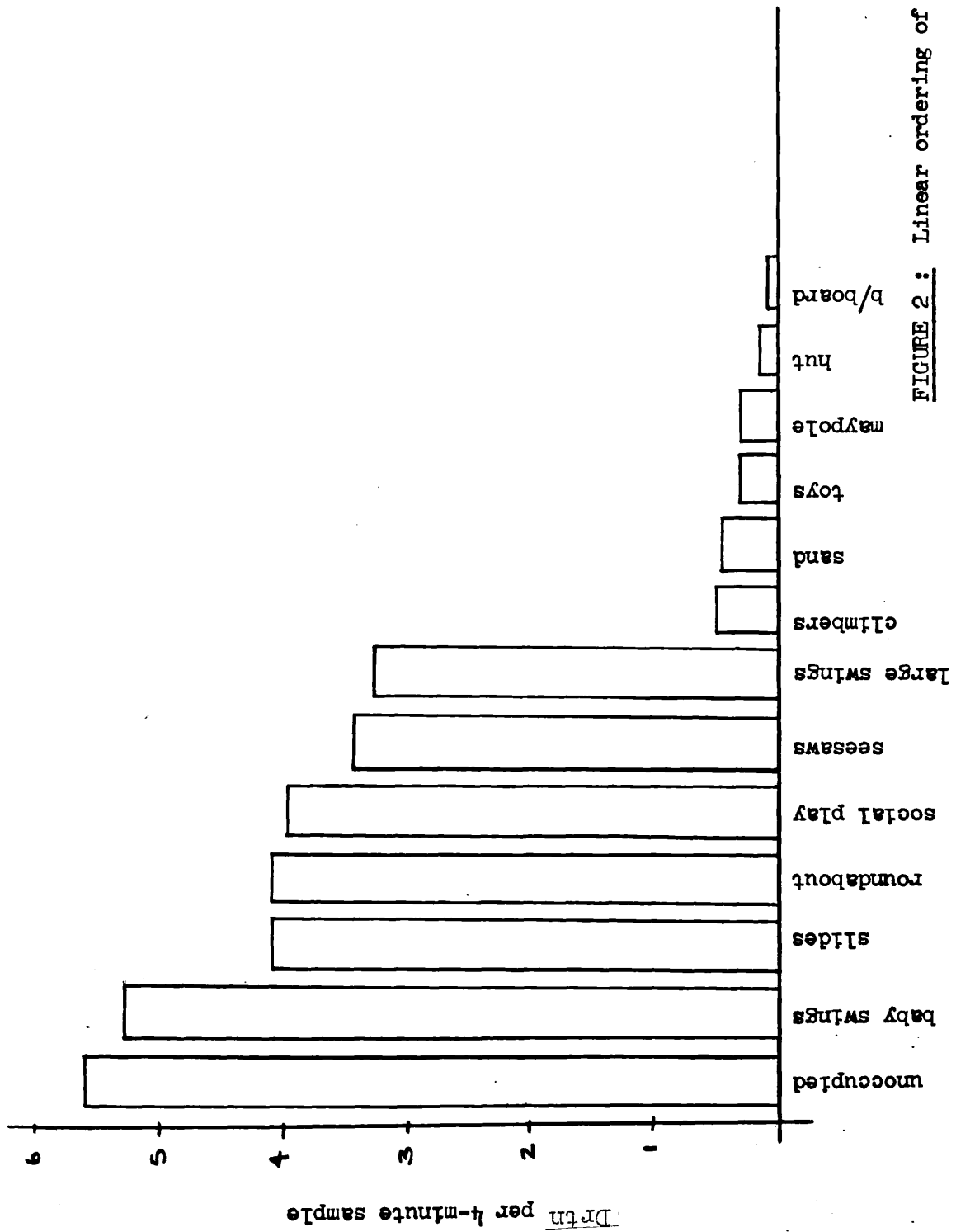


FIGURE 2 : Linear ordering of activity categories

B. Initiations and Breaks of contact

TABLE 8 : INITIATIONS OF CONTACT

INITIATIONS	MEAN Freq. PER 4-MIN SAMPLE	CHARACTERISTICS
CHILD INITIATES WITH CARETAKER	0.49	Increases with age. Decreases with more peers.
CARETAKER INITIATES WITH CHILD	0.41	Decreases with age.
CHILD INITIATES WITH OTHER	0.04	Rare category
OTHER INITIATES WITH WITH CHILD	0.04	Rare category

See also FIGURE 3.

TABLE 9 : BREAKS OF CONTACT

BREAKS OF CONTACT	MEAN Freq. PER 4-MIN. SAMPLE	CHARACTERISTICS
CHILD BREAKS WITH CARETAKER	0.24	-
CARETAKER BREAKS WITH CHILD	0.09	-
CHILD BREAKS WITH OTHER	0.05	Rare category
OTHER BREAKS WITH CHILD	0.05	Rare category

See also FIGURE 3.

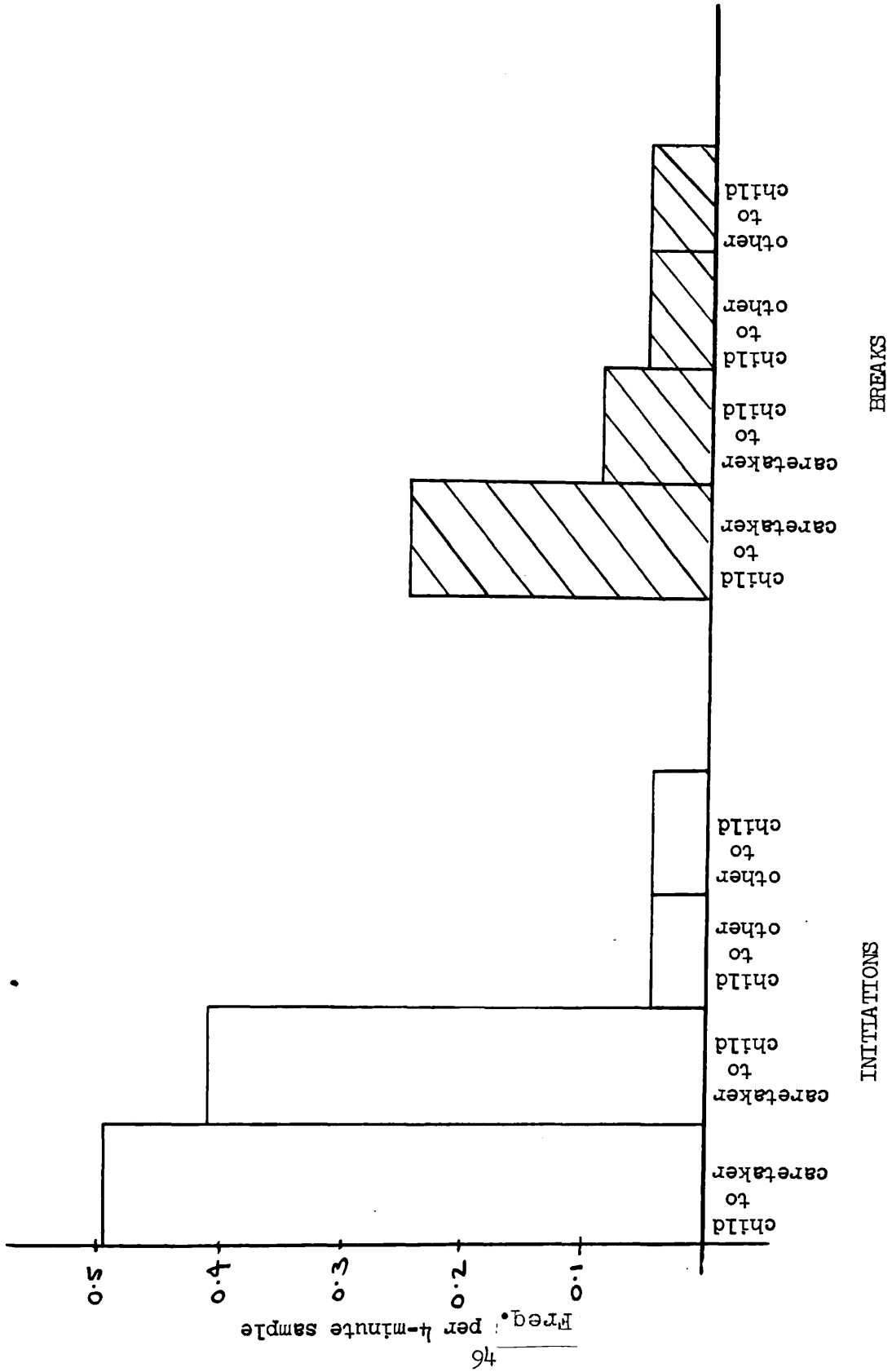


FIGURE 3 : Initiations and Breaks of Contact.

C. Direction and Mode of Social Behaviour

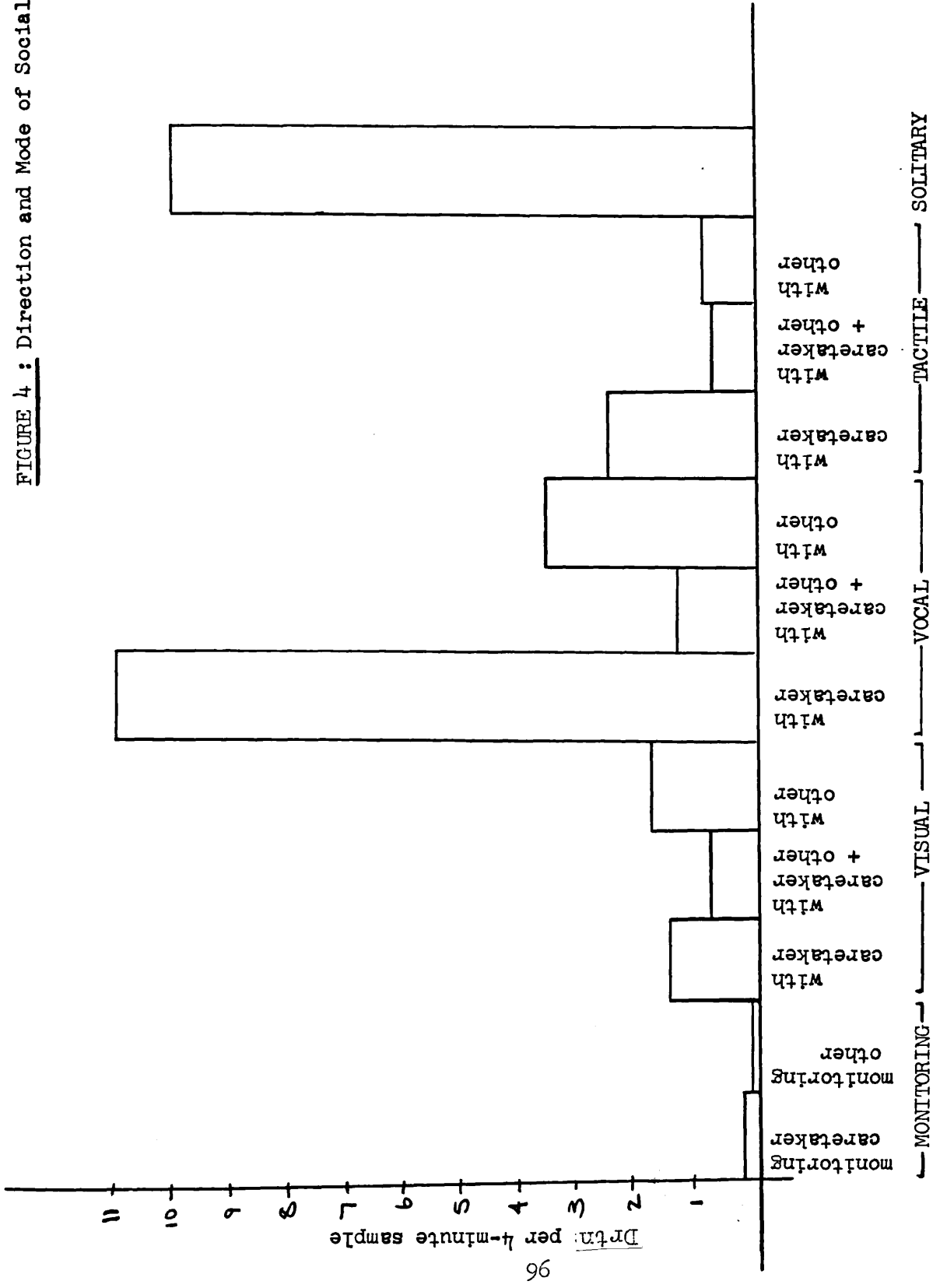
Vocal interaction with other and tactile interaction with other have been excluded from the table below owing to their poor reliability (see CHAPTER 6).

TABLE 10 : SOCIAL BEHAVIOUR CATEGORIES

MODE	DIRECTION	MEAN Drtn PER 4-MIN. SAMPLE	CHARACTERISTICS
VISUAL MONITORING	OF CARETAKER	0.28	Rare category
	OF OTHER	0.01	Rare category
VISUAL INTERACTION WITH:	CARETAKER	1.39	-
	CARETAKER + OTHER	0.72	-
	OTHER	1.70	-
VOCAL INTERACTION WITH:	CARETAKER	10.91	Less with age. Less with more peers.
	CARETAKER + OTHER	1.37	-
TOUCHING	CARETAKER	3.29	Less with age
	CARETAKER + OTHER	0.66	-
ALONE		10.00	-

See also FIGURE 4.

FIGURE 4 : Direction and Mode of Social Behaviour



D. Content of Behaviour

TABLE 11 : CONTENT CATEGORIES

CONTENT CATEGORY	MEAN Drtn PER 4-MIN. SAMPLE	CHARACTERISTICS
APPREHENSIVE BEHAVIOUR	0.32	Rare category
AGGRESSIVE BEHAVIOUR	0.05	Rare category
COOPERATIVE WITH CARETAKER	8.01	Decreases with age. Less with more peers.
COOPERATIVE WITH OTHER	0.46	Rare category

See also FIGURE 5.

SUMMARY

Children come to the playground with a wide variety of caretakers, although mothers are the most commonly observed.

In the playground, children spend more time unoccupied than in any way. Apart from this, they prefer swings, slides, roundabout, see saws, or social play about equally. Climbers, maypole, hut, blackboard, sand and toys are rarely played with.

With regard to social behaviour, children spend more time in social interaction than they do alone. They are involved in initiations and breaks of contact more frequently with their caretakers than with others, which reflects the fact that they spend more time in social contact with them. Comparing the ratios of child initiates:adult

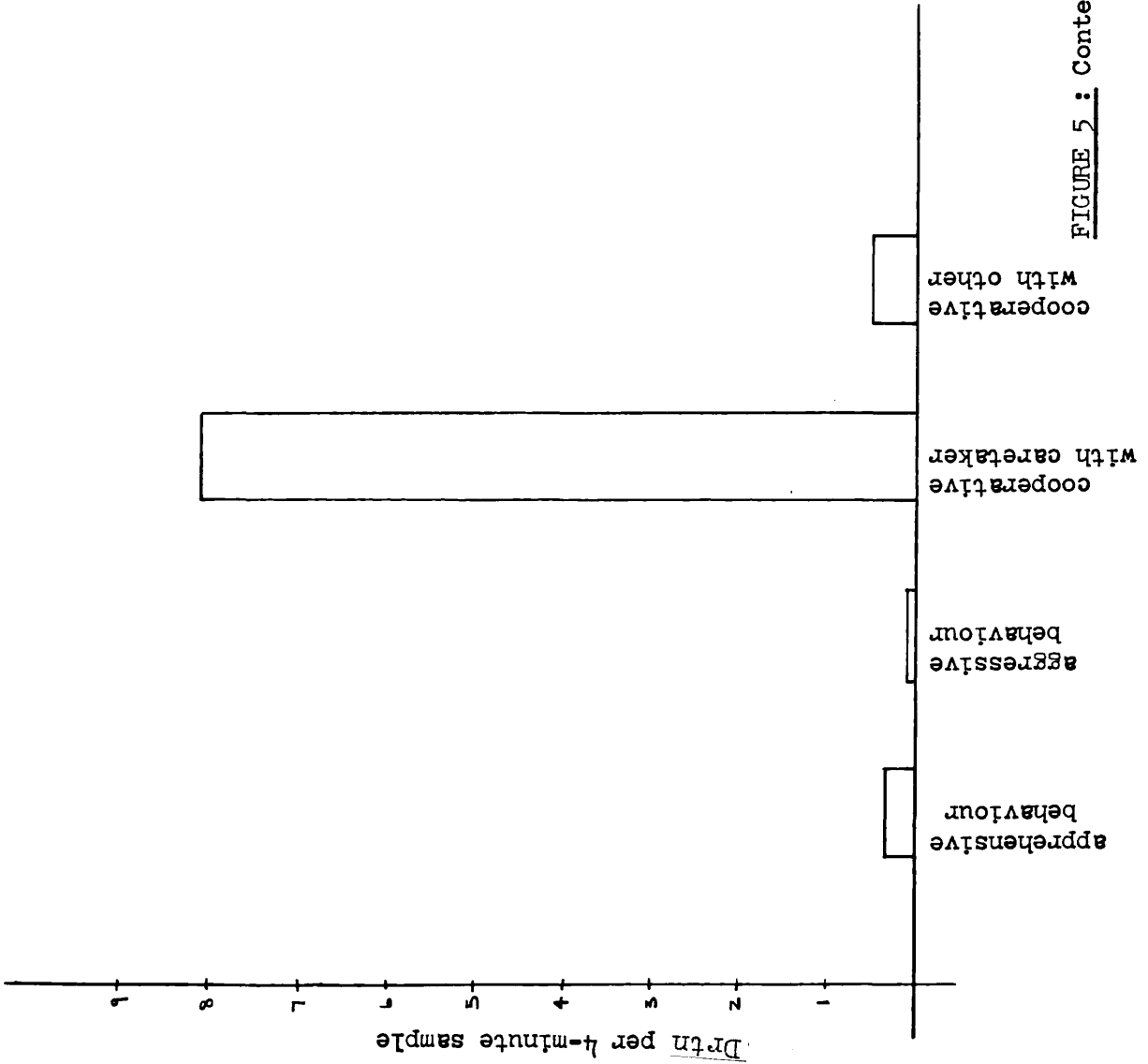


FIGURE 5 : Content categories.

initiates, it appears that the two partners initiate contact with one another about equally often. However, children break more contacts with caretaker than vice versa, suggesting that they assume greater responsibility for ending an interaction with caretaker.

The preferred mode of communication appears to be vocal.

With regard to content, roughly 50% of caretaker-child interaction was cooperative in nature. A much smaller proportion (6%) of the interaction with others was cooperative. Aggressive and apprehensive behaviours occurred very rarely.

As regards the main effects of age, sex and number of peers, it appears that age of child has the most influence on categories, with sex affecting only one category, and number of peers being of intermediate importance in determining behaviour.

Caretaker types accompanying children

As TABLE 6 indicates, children are accompanied by a wide range of caretaker types. As with Schaffer and Emerson's (1964) study of children in Scotland, and Ainsworth's (1967) study of children in Uganda, these South African children have contact with many adults in their everyday life. Some of the caretakers observed with children are linked directly with them through kinship ties, of which mother, father and grandmother are likely to be the most familiar. Others may have only indirect links with the child, and may therefore be far less intimate with them eg. peer's mother, friend of child's mother. Taken as a whole this range of caretaker types represents a broad spectrum of traditional roles - mother, father, nanny, next-door-neighbour, brother, extended kin group etc. How far some of these roles can be used to predict differences in children's behaviour will form the crux of CHAPTERS 9 to 12.

To a limited extent, the body of data described by TABLE 6 provides a counter to past research which has focussed heavily on the child's relationship with mother. It is evident, nevertheless that mothers are more frequently observed than any other caretaker, accompanying children in 35% of all the samples collected. Thus while the range of caretakers observed with children in this study suggests considerable merit in studying broader aspects of children's social experience this ought not to be at the expense of research into mother-child interaction.

After mothers, the caretaker type most often observed with children was grandmother, with fathers only 4th in this hierarchy. This may seem unexpected. Bearing in mind how much more has been written about the importance of father-child research than the importance of grandmother-child research, it was assumed that fathers would be the more frequent companion. That they were not may result from observations being made on week-day mornings, when few fathers are available for outings with their children. It is conceivable though that grandmothers are in more extended daily contact with children than fathers. Yudkin and Holme (1969) for example report grandmothers as the most frequently occurring substitute caregiver for children. It would be of great value if data were available about the extent of grandmother-child and father-child contact. There may well be some ground for concentrating as much new research on grandmother-child relations as father-child relations.

It is regrettable that the present study did not enable a division into maternal and paternal grandmothers, since anthropological and sociological evidence suggests that maternal grandmothers are closer to their grandchildren (Kahana 1969; Wilmott 1963); also maternal grandmothers are favoured more by children in preference tests (Kahana and Kahana 1970). This more detailed sub-division of roles would have provided valuable supplementary information .

As regards the relative infrequency of fathers accompanying children, this fails to support Lamb's(1975) hypothesis that fathers provide children with access to the outside world, while mothers offer home-based security and affection. The present study made use

of an 'outside world' venue, but observed 4 times as many mothers as fathers. Whilst this again is attributable to the mothers' greater availability to children during the week, even where fathers were observed accompanying children they were significantly less likely ($\chi^2(1) = 5.26, p < .05$) to be the child's only caretaker (in 34% of cases) than were mothers (in 45 % of cases)). Thus their importance as windows to the outside world can be questioned.

Nursery teachers were the third most common caretaker. This caretaker type is almost the only one where there is scope for several such caretakers being present with one child (children have only one mother, father, nanny etc.). In most cases, 3 or more teachers accompanied a group of nursery children to the playground, thus producing a rather misleading and inflated total. Also since there were 10-30 other children in most nursery groups, a child with nursery teachers may have had relatively limited scope for interaction with a caretaker.

Nannies are the fourth most common caretaker accompanying children to the playground. These were usually Zulu women who were attached to the household insofar as they lived in the grounds of the family's home. However, the term itself - although the conventional one in South Africa - is misleading in that it suggests an exclusively child-centred role. Most nannies are also responsible for cooking, washing, cleaning and other domestic chores. In this respect they are less like the traditional Victorian nanny and more like the post-Victorian rocker (Gathorne-Hardy 1972) : with the decline in upper class fortunes at the end of the Victorian era,

most nannies became a combination of servant and babysitter. This best describes the role of most South African nannies too. Nevertheless the term nanny will be used for the present study since it is in more common usage, but the general household duties of such women must be born in mind.

Nannies do not form an integral part of the child's family unit in South Africa - they live in separate quarters, eat alone, and are rarely included in family events. This is illustrated in the present study by the fact that 91% of nanny-child groups observed were dyadic ie. nannies rarely formed part of a larger caretaker group. This suggests that children will experience proportionately more dyadic interaction with nannies than with other caretakers. In many cases too they may be in prolonged contact with one another. These two factors might result in children having a more intense and exclusive relationship with nanny than they do with other adults.

Fifth most common as a caretaker is the peer's mother. Together with nannies they comprise the two more common caretaker types who do not share kinship bonds with the child. However unlike nannies, peer's mothers usually accompany the child as part of a larger caretaker group (in 63% of cases). Taken as a whole they probably have considerably less contact with children than most of the other caretaker types discussed so far.

Activity

TABLE 7 reveals that children spent more time unoccupied than in any other activity. Inspection of the raw data suggested that this resulted from moves between pieces of playground apparatus being rather indirect (eg. children rarely climbed off a swing and walked directly to a seesaw) - see APPENDIX 1 for specimens of raw data. Thus a short period of unoccupied behaviour was sandwiched in between most activity changes. Two reasons can be suggested for this.

The first assumes that children leave one activity because they prefer another. The playground was large with considerable distance between pieces of apparatus; in addition the playground base consisted of deep sand which made rapid locomotion difficult. Children may therefore have been distracted from their plan in the time it took them to reach the new piece of apparatus. If this explanation were valid, a significant age effect might be expected in the time spent unoccupied, since younger children have shorter attention spans (Van Alstyne 1932; Bott 1928) and would find locomotion more difficult in deep sand. TABLE 7 indicates that this age effect was present ($F(1,444) = 4.009, p < .05, R^2 = .01$).

The second assumes that children leave an activity before deciding on the next. This is Stodolsky's (1974) impression based on observations of nursery school children in free play. She too found few instances of children making direct moves from one activity to

another, and describes the interim period as characterised by wandering about exploring options. She too reports an age effect, with older children spending less time exploring options, so this explanation fits the data from the present study equally well.

Whatever the explanation though, the amount of time spent unoccupied is very similar to that reported for children in free-play at nursery school (Stodolsky 1974) which suggests some consistency in activity across rather different settings.

The fact that time spent unoccupied increased as the number of peers increased ($F(1,444) = 4.824, p < .05, R^2 = .04$) has also been reported by Smith and Connolly (1981). However the mechanisms responsible for this phenomenon may be somewhat different in their study, since their group sizes varied from 10 to 30 children; in the present study the range of group sizes was much smaller ie. from 2 (child and caretaker) to 6 (child, caretaker and four peers).

Similarly, the linear ordering of preferred play apparatus is very like that reported in other studies of children's free play. Hulson (1930) observed nursery school children in outdoor play and reported seesaws as being of intermediate popularity, whilst blackboards were rarely used; Hayward et al (1974) studied school-age children in American park playgrounds and reported heavy use of swings and intermediate use of seesaws. Similar patterns of apparatus use were observed in the present study. That females preferred swing play more than males accorded with a previous study on play patterns of day- and residential-care preschoolers, in which both day- and

residential groups showed this sex difference in swing use (Liddell 1978).

One feature of the children's activity is unusual however. Hulson et al (1930), Smith and Connolly(1981), Liddell (1978) and Hayward et al(1974) all report sand play as being one of the most popular forms of activity. TABLE 7 shows that it was observed only rarely in the present study. In these other studies sand had been designated as a formal activity in that it was enclosed in a pit, which presumably contained buckets and spades etc. In the playground used for the present study, sand was everywhere - it formed the floor of the playground. As such its appropriateness for play was less apparent and probably held fewer attractions for the children.

Taking the results as a whole ,it seems that the children's activities in the playground were very similar indeed to those reported in other studies of free play.

Initiations and Breaks of Contact

With regard to TABLE 8 and TABLE 9 the fact that fewer breaks of contact have been recorded than initiations is simply a reflection of the fact that coding was confined to those instances where the partner responsible for a contact being made or broken was obvious - in many cases, responsibility for breaking contacts was less clear-

cut than responsibility for initiating them.

TABLES 8 and 9 reveal that children are involved in initiations and breaks of contact much more with their caretakers than with others. This is a reflection of the fact that they spend much more time interacting with caretakers than with others (see TABLE 10). The predominance of interaction with caretakers cannot be explained by the fact that there is more potential for interaction with caretakers than there is for interaction with others. The data contained in CHAPTER 7 are based on children with one caretaker. TABLE 12 in CHAPTER 9 reveals that there was an average of one familiar peer with them. At the start of observations the number of unfamiliar children also in the playground was noted, and calculations revealed an average of one unfamiliar peer in the playground for each sample. There was, therefore, twice as much scope for initiating and breaking contacts with others as opposed to caretaker. Since initiations and breaks occur about 20 times more frequently with caretaker than with others, this represents a very marked tendency for contacts to be made and broken between caretaker and child. This concurs relatively well with Bronson's (1974) work in playgroups in which child and mother were involved in three times more initiations with one another than were child and peer, despite the fact that there were 2-3 peers present, and therefore 2 to 3 times more potential for child-peer bids.

It follows from this that there will be more interaction between caretaker and child than between other and child. Data for the Direction and Mode aspect (see TABLE 10) confirms this and is in

accordance with other naturalistic studies in which caretakers were preferred to peers or siblings as partners in interaction (Wellman and Lempers 1977; Rosenblatt and Cleaves 1981; Lamb 1977d).

However it is clear that caretakers do become less attractive to children as the number of peers increases. TABLE 8 shows that they make fewer initiatives to caretaker as the number of peers increases. This has also been reported by Rowell (in a personal communication reported by Hinde (1971a)) for Syke's monkeys, where infants spent little time on their mothers when they had access to a larger group. Similarly, Anderson (1972b) reports the presence of an age-mate as having the effect of drawing the child away from its mother in London parks.

This preference might be motivated by the child's desire to remain attached to a familiar adult. Since attachment behaviours were not distinguished from broader aspects of social interactions however, definite statements cannot be made about possible motivations. Nevertheless, in that child and caretaker displayed equal propensities for initiating contact, and in that apprehensive behaviours were rarely observed in children, there is evidence for at least some interaction being motivated by gregariousness rather than insecurity.

As regards the ratio of caretaker initiates : child initiates, it seems that initiations are made equally by both partners. This finding has also been reported for nursery school children (Smith and Connolly 1981), and children at home with their mothers (Dunn and

Wooding 1977). However children break contacts more frequently than do caretakers. This probably reflects the fact that a playground comprises a child-centred environment - there is little else for caretakers to do in a playground except interact with their children. Caretakers may thus be more willing to prolong interaction with children. By comparison, naturalistic observations made in children's home settings in which caretakers have many other tasks to fulfil reveal a very different balance between the initiations and breaks made by adult and child, with children assuming much greater responsibility for both initiations and breaks (Clarke-Stewart 1973). In this connection too, TABLE 10 suggests that children are in contact with their caretakers much more frequently (56% of the time) than has been reported from home studies of mother-child interaction by Clarke-Stewart (1973) or father-child interaction by Rendina (1976), where interaction was observed 36% of the time in both studies. In this respect the playground constitutes a relatively peculiar context for observing adult-child interaction. As Altmann (1980) says, for humans as well as other animals, most infant care is done concurrently with other activities. The opportunity for such prolonged and focussed attention from a caretaker probably occurs quite rarely in the course of children's everyday activities.

Older children were found to initiate more contacts with their caretakers. Conversely, caretakers make fewer initiatives to older children, a finding also reported in Smith and Connolly's (1972) study, where maternal initiatives to 2 year olds were more frequent than to 4 year olds. Thus children take more responsibility for

making contact with their caretakers as they get older. These findings accord too with Hinde and Herrmann's work on rhesus monkeys, although the data they present suggests that mothers are more responsible for infant's increasing independence since they reject more infant initiatives as the infant matures. To some extent, this might have been expected to show up in the data for breaking of contacts (see TABLE 9), with caretakers of older children breaking more contacts than caretakers of younger children. However, this was not found. It must be borne in mind, though, that only very gross and clear cut instances of breaking contacts were recorded. There is a possibility that a caretaker's breaking contact in order to encourage the child's independence may be characterised by subtle signals which were not readily observable in the present study. This possibility may be supported by the finding, previously mentioned, that there were fewer clear cut breaks of contact than there were clear cut initiations.

Direction and Mode of Social Behaviour

As regards the passive mode of social behaviour (viz. visual monitoring) TABLE 10 indicates that children monitor their caretakers far more than they do other people. This is congruent with the findings of many other studies (eg. Anderson 1972a; Lewis 1972). This preference may result from children using visual monitoring to ensure the continued proximity and accessibility of

caretakers (Anderson 1972a). On the other hand, it may be that children find their caretakers' activities more interesting to monitor than other peoples'. There have been some attempts to tease out the motivations underlying children's use of the visual mode (Vliestra and Manske 1981; Ashear and Snortum 1971), but these are of little assistance to the present study since they fail to distinguish between visual monitoring (ie. brief glances with no attempt at subsequent social involvement) from visual contacts accompanying smiles, waves or other signals. These two forms of visual contact can hardly be considered functionally equivalent.

As regards the more active forms of social behaviour, TABLE 10 reveals that the most prominent mode of interaction was vocal. However, children seem to show different hierarchies of preferred interaction modes depending on whether they are interacting exclusively with the caretaker or not. Interactions between caretaker and child show the following preference hierarchy :

vocal

touch

visual

In interactions involving individuals other than the caretaker (in

the form of simple child-other interaction, and more complex child-caretaker-other groups), the order of preference is different:

vocal

visual

touch

Touching then seems to be fairly exclusive to caretaker-child interaction. This accords with several other studies which report the child directing most of their tactile contact (touching, climbing on lap etc.) towards caretakers as opposed to either strangers (Anderson 1972b), or familiar adults like nursery staff (Blurton Jones and Leach 1972) or older siblings (Lamb 1978).

That older children talk to and touch their caretakers less than younger children has also been reported for nursery school children interacting with their teachers (Heathers 1955; Blurton Jones 1972b). Finley and Layne (1971) similarly report children touching their mothers less between 1 and 3 years old. The question then arises as to whether this results in more solitary behaviour in older children (as Moore et al 1974 report), or more social interaction involving others (as Honig et al 1970 report). Neither of these were found in the present study (see TABLE 10), although there was a non-significant trend towards more solitary behaviour with age ($F(1,444) = 2.06, p < .15, R^2 = .01$). It would appear that children spend less time in the more intense forms of dyadic interaction with their caretakers as they get older, and use much of this 'extra' time to play on their own rather than with a broader range of other people.

TABLE 10 also indicates that the ratio between the rate of solitary behaviour and social behaviour (10.00 : 24.62) is about the same as that reported in nursery studies (Smith and Connolly 1981; Parten 1943).

Across the categories involving social interaction with caretaker, there is only one which is affected by the number of peers present : children initiate fewer contacts with caretaker as number of peers increases (see TABLE 8). This is not in accordance with the findings of Dunn and Kendrick (1982) in which there were several differences in social interaction between caretaker and child after the birth of a sibling. Since 68% of 'peers' were in fact the focal child's siblings (the remainder being friends), this was even more surprising.

Dunn and Kendrick's study however, looked at the effects of a newborn sibling on the child's interaction with mother. The youngest infant in the present study was already 5 months old, and less than 5% of the sample were under 10 months old. There was therefore much more opportunity for caretakers to be involved with both children at once, since their abilities and needs were likely to be similar.

Second it should be noted that the mothers in Dunn and Kendrick's study did not interact less with their firstborns during periods of involvement with the baby - the decrease in maternal attention occurred at other times, presumably because mothers had to spend more of their 'free' time on household duties. In the playground there were no distractions of this nature, and caretakers may thus

have found it easier to provide two or more children with as much attention as one.

On the whole then, the results as regards preferred modes of social behaviour and to whom these behaviours are directed are in accordance with other research.

Content of Behaviour

Categories incorporated into the analysis of content proved disappointing in that only one of them (cooperation with caretaker) occurred often enough for further analysis (see TABLE 11).

The rarity of apprehensive behaviour suggests that few children felt at all apprehensive in the playground. This was probably attributable to several factors. Firstly because they were accompanied by familiar adults; secondly because most of them came fairly regularly (40% came at least once a fortnight - see APPENDIX 3 for details of the regularity of children's visits to the playground); thirdly because observations were made an average of 14 minutes after children had entered the playground, by which time they would have been well habituated to the setting. Thus, although stress and apprehensive behaviours seem easily elicited in laboratory studies where events like brief separations can be arranged, the playground proved unsuitable for any detailed analysis of them.

As regards aggressive behaviour, this too occurred only rarely, which concurs with both the home studies of Castell (1970) and the nursery studies of Blurton Jones (1972b), Tizard et al (1976) and McGrew (1972). In retrospect it may have been rather naïve to expect many instances of aggression in a venue such as this. Factors promoting aggression include high density (Bates 1971), competition for scarce resources (Maudry and Nekula 1939; Smith and Connolly, 1977; Smith and Connolly 1981), and absence of adults (Hutt and Vaizey 1966) none of which were common features of this playground.

As regards cooperative interaction, a large proportion (approximately 52%) of childrens' interaction with caretakers was of this nature, suggesting a closely synchronised and sensitive patterning of interaction between caretaker and child. By contrast few (approximately 5%) interactions with other were cooperative. Since the bulk of childrens' interaction with 'other' consisted of interactions with siblings, familiar peers, and unfamiliar children, the social immaturity of both partners may have made any prolonged bouts of cooperative interaction unlikely.

The decrease in cooperative behaviour with age probably reflects two related factors : the child's increasing independence (and possibly the adult's encouragement of this), and his increasing maturity through which he is physically capable of achieving more without adult assistance. The decrease in cooperative interaction with caretaker as more peers are present might reflect some breakdown in the synchrony and sensitivity with which child and caretaker interact when there are other social partners present, a finding

reported for adult-child interaction in day nurseries (Schaffer and Liddell, in press). Alternatively it might result from the focal child making fewer bids for help when peers are present, as reported for nursery school children (O'Connor 1975). However it is thought more likely to be the result of the caretaker having to assist two or more children instead of just one, thus having to budget the amount of time she cooperates with the focal child. This was perhaps clearest in one of the more common forms of cooperative interaction viz. caretaker pushing child on swings. This took the form of a continuous cooperative interaction when the caretaker had only one child to attend to; with two children though, the caretaker took turns pushing one child then the other. This effectively halved the amount of time the caretaker cooperated with a focal child.

Conclusion

As regards the selection of categories, most proved readily observable and produced results which were directly in line with those from similar studies. This is encouraging since it suggests that the patterns of activity observed in the playground were representative and that results may well be generalisable.

However, there would have been some merit in selecting more regularly observable content categories. For example, information could have been gathered as to the number of times shared activities were chosen by the child as opposed to the adult, the number of instances in which positive affect (smiles, cuddles, laughs, etc.)

was evident in the child's interaction with caretakers. These were more frequently observable and could thus have been analysed in more detail.

One exception to the list of similarities between the present study and related research is the paucity of sex differences reported here: only one sex difference was found across all activity and social interaction categories (see TABLE 7). By comparison, females have been found to talk more than males in nursery schools (Smith and Connolly 1972; Brownell and Smith 1973); females have been found more gregarious - especially with adults - in London and Bushman cultures (Blurton Jones and Konner 1973); they have also been found to prefer fine motor play to gross physical activities (Garvey 1977).

Two factors might be responsible for the present study failing to report such sex differences. First the playground itself offered very little range of activities : its purpose was to cater for gross physical play. Any sex differences may thus have been masked. Second the playground differs from home or nursery school settings in that children are in frequent and often prolonged contact with a constantly attentive adult. In such circumstances it is possible that the sex differences which might occur when the child is either alone or with a peer group, are counterbalanced by an adult's guidance and suggestions.

In general though, social and other activity patterns of the children observed fitted well with the findings of other research in

nurseries and homes. This consistency of behaviour, despite considerable differences in setting, accords well with Roper and Hinde's (1978) reports of consistency in childrens' social behaviour between classroom and outdoor playground. In addition, it suggests that public playgrounds comprise a setting as suitable for research into children's social behaviour as the more traditional venues.

CHAPTER 9 : CHILDREN WITH ONE CARETAKER

9:1 Introduction

This chapter focusses on children who were accompanied by only one caretaker. It aims to see whether children who are accompanied by different caretakers exhibit different patterns of activity and social behaviour. As outlined in CHAPTER 7, a limit of 18 4-minute samples per caretaker type was selected as the minimum number that would be handled statistically. TABLE 12 details children with the 5 caretaker types that met these two criteria. In total the data for these samples represented 49.94% of all the samples collected.

For each caretaker type, TABLE 12 also incorporates details of children's age and sex distribution, and familiar peers accompanying them. 'Peers' is used as a general term and includes siblings as well as friends of the focal child.

TABLE 12 : CHILDREN WHO ARE ACCOMPANIED BY A SINGLE CARETAKER -
NUMBER OF 4-MINUTE SAMPLES AND SUBJECT DETAILS.

CARETAKER	NO. OF SAMPLES	SAMPLES BY SEX		MEAN AGE IN MTHS.	AGE RANGE	RANGE IN NO. PEERS	MEAN NO. PEERS
		M	F				
Mother	218	114	104	32	5-65	0-4	0.9
Nanny	92	33	59	27	5-70	0-2	1.0
Grandmother	67	41	26	35	10-70	0-3	0.6
Father	43	32	11	38	15-70	0-2	0.4
Peer's mother	25	16	9	39	25-60	0-3	1.8

9:2 OUTLINE OF RESULTS PRESENTATION

The results proper are presented in (SECTION 9:3).

The basic measurement used in the study is rates per 4-minute sample. For analysis, these rates were converted into logarithms. Reasons for this are threefold. First, logarithmic transformations can be expected to improve (though not ensure) an approximation to the conventional assumption of normality and homogeneity of variance. Second, the use of logarithms prevents the derivation of regression equations that predict negative rates of behaviour (Bock and Haggart 1968). Third, and perhaps most important in considering statistical interactions, the main interest is in ratios of rates rather than differences. To illustrate, imagine the following pattern of mean rates:

	with mother	with father
boys	2	8
girls	22	28

A test for interaction between caretaker type and child's sex compares one difference ($2 - 8 = 6$) with the other ($28 - 22 = 6$). These two differences are identical, which means that this test indicates no interaction effect. However, with rates, it is more reasonable to compare ratios ie. $2/8 = .25$ versus $22/28 = .79$. On this basis, there may well be an interaction. Regression and ANOVA analyses work on the "linear" differences principle, but transformation to logs translates an analysis of ratios into a form that suits the linear model.

The relationship between caretaker type and behaviour category was likely to be a complex one, and affected by variables other than caretaker type. Three other variables were selected as the ones particularly likely to affect this relationship. Thus in addition to caretaker type, sex of child, age of child, and the number of familiar peers accompanying the caretaker-child pair were treated as independent variables. In the case of child's sex, there was substantial evidence from comparative work on mother-child versus father-child interaction to suggest that different caretakers might be affected differently by this (Ban and Lewis 1974; Lewis and Weinraub 1974; Lewis 1972; Margolin et al 1975). As regards age, no research was found which would suggest that different caretakers might be affected differently by this - in fact Lamb (1977b) reports it to have the same effect on children's interaction with mothers, fathers and strangers. Nevertheless age was included as a key independent variable since it was considered important to provide a broader empirical test of Lamb's finding. As regards the number of peers, this had been found to exert an effect on mother-child interaction (Anderson 1972a) and was thus included here. Since age and number of peers are continuous variables, whilst sex and caretaker type are categorical, a multiple regression analysis was used. The form of the analysis is analogous to the 'method 3' least squares ANOVA of Overall and Spiegel (1969) in which the independent variables are entered in an a priori order derived from logical considerations concerning the relationships among the variables. In particular, the sex and age of the child as well as the combination (interaction) of sex and age, would plausibly influence the type of caretaker accompanying a child to the playground. Consequently age,

sex, and the age x sex interaction were entered prior to caretaker type. It was thought that caretaker type would influence the number of familiar peers accompanying the caretaker-child pair, rather than vice-versa therefore number of peers and the peers x caretaker interaction were entered last. Thus the order in which variables were entered into the regression were as follows:

- age of child
- sex of child
- age x sex
- caretaker type
- caretaker type x age
- caretaker type x sex
- caretaker type x age x sex
- number of peers
- caretaker type x number of peers

The prime focus is on the main effect of caretaker type and on the interaction between caretaker type and the other three independent variables . The main effect of age, sex, peers, and their interactions are included as blocking variables to reduce the error variance.

As outlined in CHAPTER 5, 4 different aspects of behaviour were coded (Activity, Initiations and Breaks of Contact, Direction and Mode of Social Behaviour, and Content of Behaviour). Each of these aspects are dealt with separately. Within each, a list is first given of the categories making up the aspect. Then, rarely occurring categories are presented, since these have been excluded from further analysis because of their small N. These categories can then

be disregarded. Thereafter the analyses proper are presented according to the 5 sorts of caretaker effect that were examined. These were main effect of caretaker type; caretaker type x age interaction; caretaker type x sex interaction; caretaker type x age x sex interaction; caretaker type x number of peers interaction. A sixth section includes all categories of behaviour in which no effect involving caretaker type was found. Thus for each aspect of child behaviour, the presentation format is as follows :

1. Rarely occurring categories - these can then be disregarded.

2. Main effect of caretaker - under this heading are discussed categories of behaviour in which there is a direct effect of caretaker type, with no interaction of caretaker type with age, sex, or number of peers. In these cases, follow-up tests have been made to establish which caretaker types are producing the effect. The follow-up tests involve Scheffè's S-method for all pair-wise comparisons (mother versus grandmother, grandmother versus nanny, nanny versus father etc.). The S-method is particularly suitable, firstly in that it is robust (which is of importance since the 5 groups may not have equal variances) and secondly in that it is conservative (which is of importance when analysis involves groups with large N's).

3. Caretaker type x age effect - under this heading are discussed categories of behaviour in which the caretaker effects depend on the age of the child. Here a simple main effects test was conducted in which the effect of age was assessed for each caretaker type. Since

* In drawing up plots, the logged conversions of raw data were used, just as they were for the regression analyses. Having drawn each plot, these logged values were then substituted with their antilog equivalents, in order that the plots be more easily interpretable as duration scores. Thus each plot is based on logged data with antilog conversions superimposed on the Y-axis after plotting.

age was a continuous variable it is not possible to present tables containing mean rates of behaviour for each age category. Therefore, the effect of age within each caretaker type has been illustrated by plotting behaviour category against age. The quadratic component of the age factor was used to allow for curvilinear plots (see footnote page 124a).

4. Caretaker x sex effect - under this heading are discussed categories of behaviour in which the caretaker effects depend on the child's sex. Here a simple main effects test was conducted in which the effect of sex was assessed for each caretaker type. Mean durations of behaviour for males and females across the 5 caretaker types are then presented in tables.

5. Caretaker x age x sex effect - under this heading are discussed categories of behaviour in which the effects depend on the combination of age and sex. Follow-up tests here involved simple interaction effects analysis in which the age x sex interaction was assessed for each caretaker type first; where appropriate a simple simple effects test was then done in which the effect of age on the two sexes was examined. Results are illustrated by plotting behaviour category against age for each of the sexes, again using the quadratic component of the age factor.

6. Caretaker type x number of peers - under this heading are discussed categories of behaviour in which the caretaker effects depend on the number of peers present. Here a simple main effects analysis was conducted in which the effect of peers was assessed for

each caretaker type. Although number of familiar peers was treated as a continuous variable in the regression analyses it has been broken into categories (no peers, 1 peer, 2 peers etc.) for clearer presentation. Tables of results have therefore been presented.

7. Categories of behaviour in which there was no effect involving caretaker type.

Significant results are presented with details of degrees of freedom, F ratio or chi squared value, and level of probability; where appropriate, the value of R^2 (ie.how much of the total variance is explained by the particular effect being discussed) is given.

The study's main interest lies in assessing whether caretaker type has an effect on children's activity and social behaviour. However, the form in which the results are laid out makes it difficult to form a picture of children's behaviour with any one caretaker. A way of avoiding this would have been to present results caretaker by caretaker, but this would have led to reduncancy, with each category being discussed 5 times over. Instead, the results have been presented effect by effect, but a summary at the end of each subsection presents significant results caretaker by caretaker.

9:3 RESULTS

A. Activity

This category comprises the various forms of apparatus play (swing, slide, see-saw etc.), social play, and unoccupied behaviour.

1. Rarely occurring categories -

- a) children's play on climbers.
- b) children's play in hut.
- c) children's play with blackboard.
- d) children's play with maypole.
- e) children's play with their own toys.
- f) children's play with sand.

It seemed unreasonable to group any or all of these categories together to make statistical testing possible, since the activities were so diverse that they could not be grouped together into meaningful units.

2. Main effect of caretaker type - none.

3. Caretaker type x age -

a) children's play on slides - ($F(4,444) = 2.878, p < .05$, $R^2 = .03$). A significant main effects test indicated that the children who used the slides differentially according to age were accompanied by nanny ($F(1,444) = 4.672, p < .05, R^2 = .06$) or peer's mother ($F(1,444) = 3.861, p < .05, R^2 = .12$). Plotting slide play against age (see FIGURE 6) for these two caretaker types

revealed that children with nanny used slides increasingly more with age ; children with peer's mother used them more with age until about 4 years old, and less with age thereafter.

4. Caretaker type x sex - -----

a) children's play with large-swings - ($F(4,444) = 2.393$, $p < .05$, $R^2 = .02$). A significant main effects test indicated that the children who exhibited a sex difference in their use of the large -swings were accompanied by mother ($F(1,444) = 14.213$, $p < .001$, $R^2 = .06$) or peer's mother ($F(1,444) = 5.257$, $p < .05$, $R^2 = .17$). TABLE 13 details the mean rates of large-swing play per 4 minute sample for all caretaker-sex combinations. From this it is evident that females who are accompanied by mother or peer's mother use the large-swings more than males who are accompanied by the same caretakers.

b) children's play with baby swings - ($F(4,444) = 2.830$, $p < .05$, $R^2 = .03$). A significant main effects test indicated that the children who exhibited a sex difference in their use of baby-swings were accompanied by father ($F(1,444) = 6.269$, $p < .01$, $R^2 = .08$). TABLE 13 reveals that females accompanied by father use the baby-swings more than males .

c) children's social play - ($F(4,444) = 3.054$, $p < .05$, $R^2 = .03$). A significant main effects test indicated that the children who exhibited a sex difference in social play were accompanied by nanny ($F(1,444) = 4.039$, $p < .05$, $R^2 = .04$). TABLE 13 reveals that females accompanied by nannies are more likely to exhibit social play than males.

FIGURE 6 : Slide Play according to age for children with nanny and peer's mother.

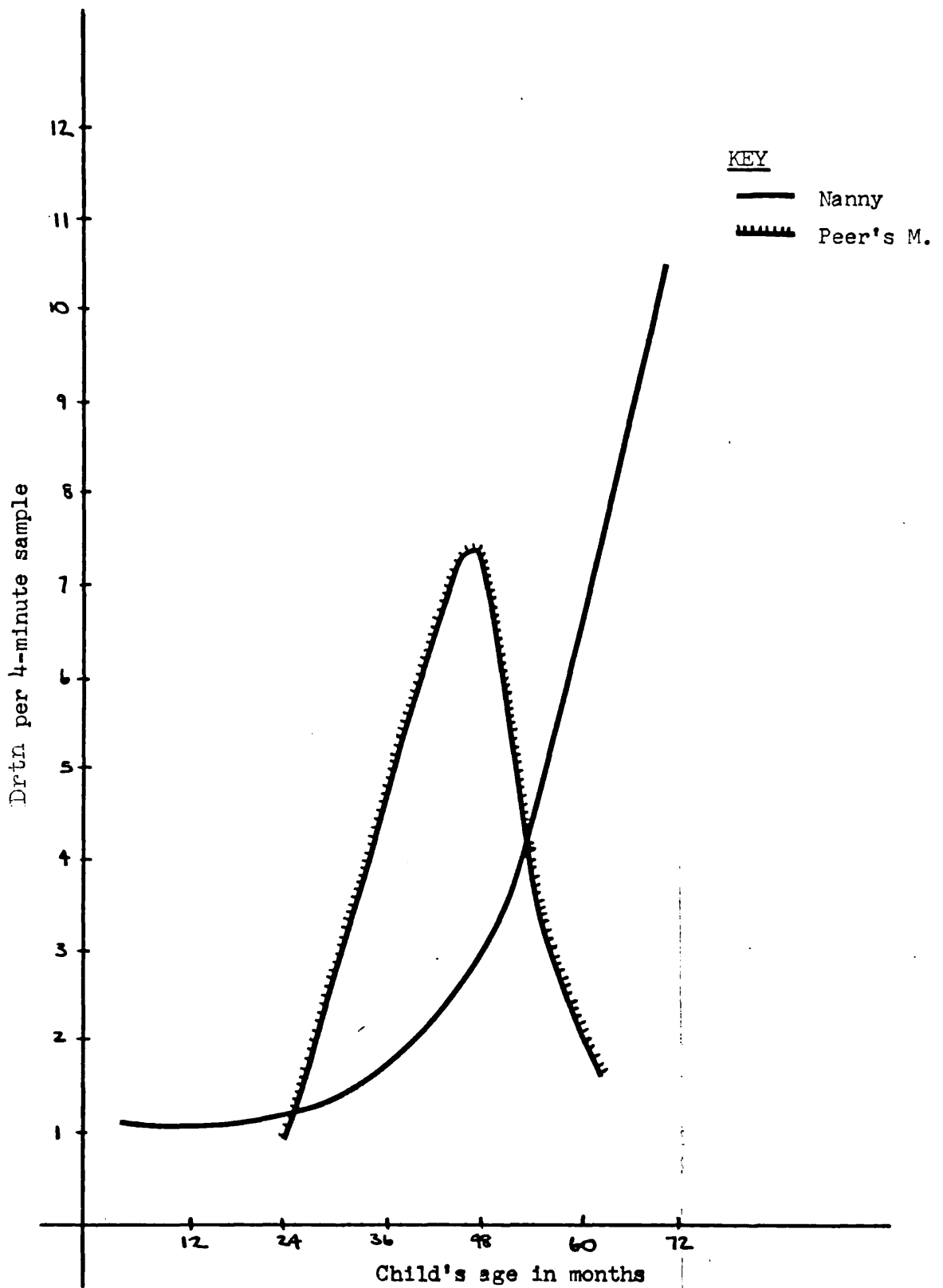


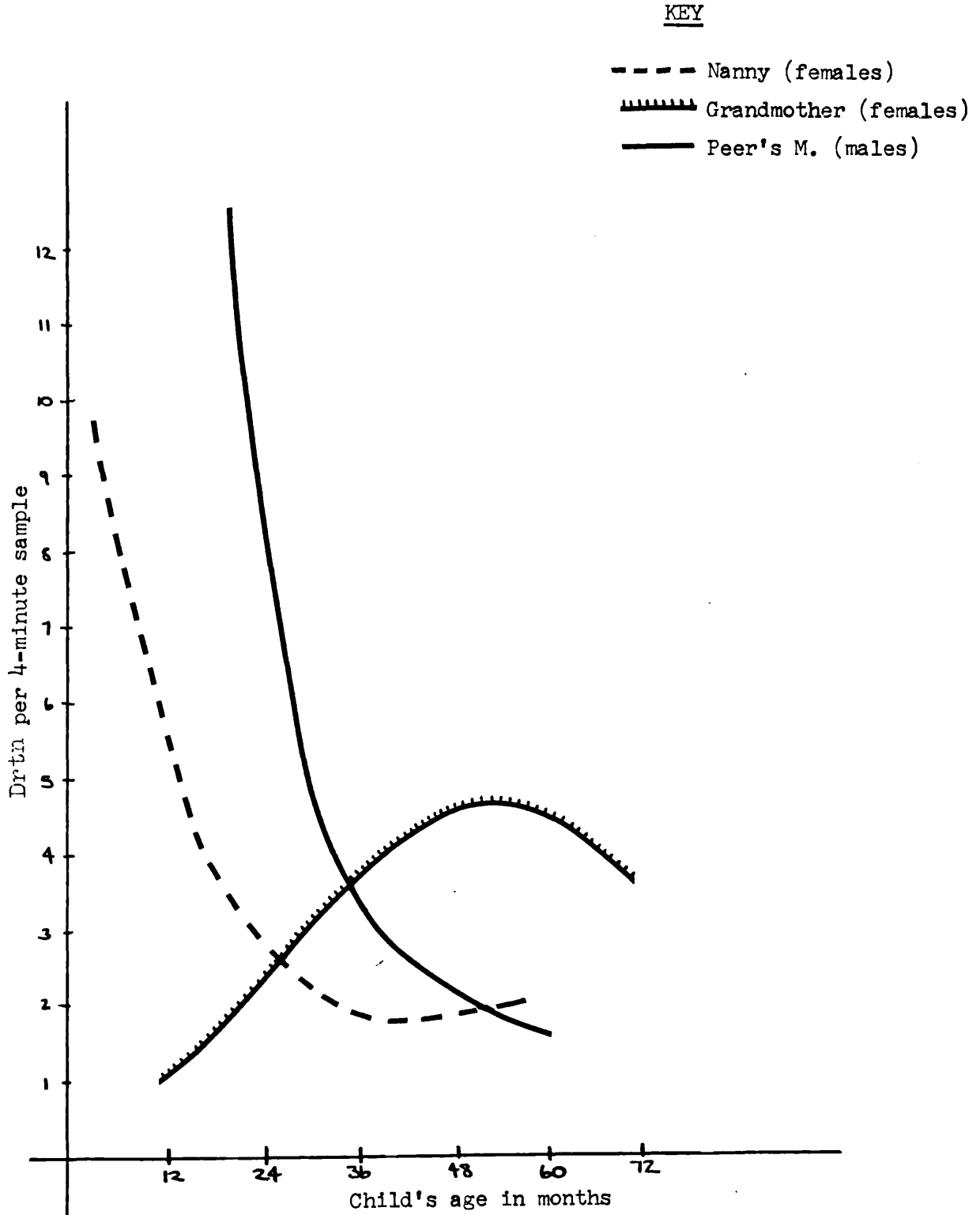
TABLE 13 : ACTIVITIES EXHIBITING A CARETAKER X SEX INTERACTION -
 MEAN Drtn PER 4-MINUTE SAMPLE.

	MOTHER		NANNY		GRANDMOTHER		FATHER		PEER'S M.	
	M	F	M	F	M	F	M	F	M	F
LARGE SWING PLAY	1.81	4.94	2.47	3.01	2.68	2.60	5.31	3.19	1.91	6.86
BABY SWING PLAY	3.67	4.89	9.79	6.18	5.08	7.67	4.43	10.91	5.47	0.51
SOCIAL PLAY	4.35	3.64	2.35	4.14	3.94	5.17	4.89	2.19	3.37	2.64

5. Caretaker type x age x sex effect -

 a) unoccupied - ($F(4,444) = 4.767, p < .001, R^2 = .04$). Simple interaction effects analysis failed to reveal age x sex effects for any of the 5 caretakers. Further follow-up tests therefore involved the effects of age on each of the 10 caretaker-sex combinations. These revealed that females with nanny ($F(1,444) = 5.776, p < .05, R^2 = .10$), and males with peer's mother ($F(1,444) = 6.612, p < .05, R^2 = .04$) spend less time unoccupied as age increases; females with grandmother ($F(1,444) = 8.481, p < .01, R^2 = .13$), on the other hand, spend more time unoccupied as age increases until about four years, then less with age thereafter. These results are illustrated in FIGURE 7.

FIGURE 7 : Unoccupied Behaviour according to age for females with nanny, females with grandmother, and males with peer's mother.



6. Caretaker type x number of peers -

a) children's play with large swings - (F (4,444) = 3.706, $p < .01, R^2 = .03$). A significant main effects test indicated that the children whose play with large-swings was affected by the number of familiar peers, were accompanied by father (F (1,444) = 6.269 , $p < .01, R^2 .10$). TABLE 14 reveals that children accompanied by father play less on the large-swings as the number of peers increases.

TABLE 14 : LARGE SWING PLAY - MEAN Drtn PER 4-MINUTE SAMPLE ACCORDING TO CARETAKER TYPE AND NUMBER OF PEERS.

LARGE-SWING PLAY	MOTHER	NANNY	GRANDMOTHER	FATHER	PEER'S M.
NO PEERS	3.47	3.64	1.91	5.33	1.91
1 PEER	2.99	2.84	2.76	3.13	6.86
2 PEER	4.34	2.34	6.70	0.00	1.64
3 PEER	1.07	-	-	-	3.17
4 PEER	0.50	-	-	-	-

7. No effect involving caretaker type -

- a) children's play on the roundabout.
 b) children's play on seesaws.

TABLE 15 : SUMMARY OF RESULTS FOR ACTIVITY CATEGORIES

SIGNIFICANT SIMPLE EFFECTS FOR EACH CARETAKER TYPE.

ACTIVITY	INTERACTION TERM	DETAILS OF SIMPLE EFFECTS
LARGE SWING PLAY	CT X SEX	FEMALES MORE THAN MALES WHEN WITH MOTHER.
SLIDE PLAY	CT X AGE	INCREASE WITH AGE WHEN WITH NANNY.
SOCIAL PLAY	CT X SEX	FEMALES MORE THAN MALES WHEN WITH NANNY.
UNOCCUPIED	CT X AGE X SEX	FEMALES LESS WITH AGE WHEN WITH NANNY
UNOCCUPIED	CTXAGE X SEX	FEMALES MORE WITH AGE TO 3YRS. THEN LESS WHEN WITH GRANDMOTHER.
BABY SWING PLAY	CT X SEX	FEMALES MORE THAN MALES WHEN WITH FATHER
LARGE SWING PLAY	CT X NO. OF PEERS	LESS WITH PEERS WHEN WITH FATHER
SLIDE PLAY	CT X AGE	MORE WITH AGE TO 4YRS. THEN LESS WHEN WITH PEER'S MOTHER
LARGE SWING PLAY	CT X SEX	FEMALE MORE THAN MALES WHEN WITH PEER'S MOTHER

When children are accompanied by their mothers, the other variables (ie. age, sex and number of peers) do not exert marked effects on activity. The only significant effect was for large-swing play which was exhibited more by females accompanied by mother than by males.

When children are accompanied by their nannies, the other variables exert fairly marked effects on activity. With increasing age these

children show a significantly greater amount of slide play ; also with increasing age females exhibit more social play than males, and spend less time than males in unoccupied behaviour.

Females accompanied by grandmother spend more time unoccupied with increasing age. Otherwise age, sex and number of peers exert no significant effects on the activity of children accompanied by their grandmothers.

When children are accompanied by father, their use of swings is affected by the other variables .They play less on large-swings as the number of peers increases; females with father also use the baby-swings more than males.

When children are accompanied by peer's mother,the other variables affect slide and large-swing play. These children play more on the slide with increasing age until they are about 4 years old, after which they use the slide less with age. Females with peer's mother play more on large-swings than males.

B. Initiations and Breaks of Contact

This category consists of child initiates contact with caretaker, child initiates contact with other, child breaks contact with caretaker, child breaks contact with other, caretaker initiates contact with child, caretaker breaks contact with child, other initiates contact with child, other breaks contact with child.

1. Rarely occurring categories -

- a) child initiates contact with other
- b) child breaks contact with other
- c) other initiates contact with child
- d) other breaks contact with child

All these occurred too rarely for analysis to be feasible. Even when a) and c) were grouped into an 'initiations between child and other' category, and b) and d) were grouped into a 'breaks between child and other' category, numbers were still too small.

2. Main effect of caretaker type - none.

3. Caretaker x age - none.

4. Caretaker type x sex -

a) caretaker initiates contact with child - ($F(4,444) = 3.015$, $p < .05$, $R^2 = .02$). A significant main effects analysis indicated that this was the case for children with mother ($F(1,444) = 9.518$, $p < .01$, $R^2 = .04$). Table 16 reveals that mothers initiate contact more with males than females.

TABLE 16 : CARETAKER INITIATES CONTACT WITH CHILD - MEAN Freq PER 4-MINUTE SAMPLE.

MOTHER		NANNY		GRANDMOTHER		FATHER		PEER'S M.	
M	F	M	F	M	F	M	F	M	F
1.20	0.90	0.81	1.06	0.83	0.95	0.92	0.81	1.06	0.93

5. Caretaker type x age x sex - none.

6. Caretaker x peer -

a) child initiates contact with caretaker $-(F(4,444) = 3.024, p < .05, R^2 = .06)$. A significant main effects analysis revealed that children whose initiations of contact with caretakers were affected by the number of peers, were with nanny $(F(1,444) = 4.708, p < .05, R^2 = .06)$. TABLE 17 reveals that children with nanny initiate fewer contacts as the number of peers increases.

TABLE 17 : CHILD INITIATES CONTACT WITH CARETAKER - MEAN Freq PER 4-MINUTE SAMPLE ACCORDING TO CARETAKER TYPE AND NUMBER OF PEERS.

	MOTHER	NANNY	GRANDMOTHER	FATHER	PEER'S M.
NO PEER	1.18	1.46	0.98	0.93	0.62
1 PEER	1.21	0.95	1.57	0.99	0.97
2 PEERS	0.88	1.02	1.47	0.50	1.05
3 PEERS	0.77	0.57	-	-	0.82
4 PEERS	0.49	-	-	-	-

7. No caretaker effect -

- a) caretaker breaks contact with child
- b) child breaks contact with caretaker
- c) ratio of child initiates:caretaker initiates
- d) ratio of child breaks:caretaker breaks

TABLE 18 :SUMMARY OF RESULTS FOR INITIATIONS AND BREAKS OF CONTACT

SIGNIFICANT SIMPLE EFFECTS

INITIATION/ BREAK	INTERACTION TERM	DETAILS OF SIMPLE EFFECTS
CT. INITIATES WITH CHILD	CT X SEX	MORE TO MALES WHEN WITH MOTHER.
CHILD INITIATES WITH CT.	CT X NO. OF PEERS	FEWER WITH MORE PEERS WHEN WITH NANNY

Mothers initiate more contact with males than with females.

Children accompanied by nannies initiate fewer contacts with her as the number of peers accompanying them increases.

Children accompanied by grandmother, father or peer's mother are not unusually affected by age, sex or number of peers in their initiations and breaks of contact with caretaker. Nor are these caretakers more affected by these variables in the contacts they make and break with the child than are other caretakers.

C. Direction and Mode of Social Behaviour

Social behaviours could involve the child with caretaker, other, or caretaker + other. The modes of social behaviour were visual monitoring, visual interaction, vocal interaction and tactile interaction. Visual interaction with other and tactile interaction with other were omitted because of low reliability (see CHAPTER 6).

1. Rarely occurring categories -

- a) visual monitoring of caretaker.
- b) visual monitoring of other.
- c) touching caretaker + other.

2. Main effect of caretaker type -

a) visual with caretaker - ($F(4,444) = 3.178, p < .05, R^2 = .03$). Mean rates per 4-minute sample are presented on TABLE 19a. Results of the follow-up test using Scheffé's S-method for all pairwise comparisons are presented on TABLE 19b. On the basis of these it is possible to construct a hierarchy for the rate at which visual interaction between caretaker and child occurs for the 5 caretaker types : children with nanny and father are involved in it most, children with grandmother and mother less ,and children with peer's mother least.

TABLE 19a : VISUAL INTERACTION WITH CARETAKER - MEAN Drtn PER
4-MINUTE SAMPLE .

	MOTHER	NANNY	GRANDMOTHER	FATHER	PEER'S M.
MEAN RATE	1.14	1.86	1.41	2.04	0.65

TABLE 19b : VISUAL INT^{ER}ACTION WITH CARETAKER - PAIRWISE COMPARISONS
OF Drtn FOR ALL 5 CARETAKER TYPES

CARETAKER TYPE	MOTHER	NANNY	GRANDMOTHER	FATHER	PEER'S M.
MOTHER	-	*	N.S.	*	N.S.
NANNY	-	-	*	N. S.	*
GRANDMOTHER	-	-	-	*	*
FATHER	-	-	-	-	*

* p < .05

b) children's solitary behaviour - ($F(4,444) = 3.764, p < .01, R^2 = .03$). Mean rates per 4-minute sample are presented in TABLE 20a. Results of the follow-up test using Scheffé's method for all pairwise comparisons are presented in TABLE 20b. On the basis of these it is possible to construct a hierarchy for the rate at which children with different caretakers spend time alone : children with mother or peer's mother spend the most time alone, then children with grandmother or nanny, with children accompanied by father spending the least time alone.

TABLE 20a : SOLITARY BEHAVIOUR - MEAN *Drtn* PER 4-MINUTE SAMPLE FOR ALL 5 CARETAKER TYPES.

	MOTHER	NANNY	GRANDMOTHER	FATHER	PEER'S M.
MEAN RATE	11.32	8.58	9.19	7.22	10.73

TABLE 20b : SOLITARY BEHAVIOUR - PAIRWISE COMPARISONS OF *Drtn* FOR ALL 5 CARETAKER TYPES

CARETAKER TYPE	MOTHER	NANNY	GRANDMOTHER	FATHER	PEER'S M.
MOTHER	-	*	*	*	N.S.
NANNY	-	-	N.S.	*	*
GRANDMOTHER	-	-	-	*	*
FATHER	-	-	-	-	*

* $p < .05$

Taken together, TABLES 19 and 20 suggest that children with fathers are involved in more interaction than children with other caretakers, and that this increased interaction takes the form of visual contact between father and child. However, visual contact with father occurs relatively rarely (see TABLE 19a), and cannot be the sole contributor to children with father spending significantly less time alone. It was therefore hypothesised that children with fathers would exhibit a trend towards more social interaction across several categories, with visual interaction being the only one which reached significance. Thus, the cumulative effect would be markedly less solitary behaviour. Examination of TABLE 21 below reveals some evidence for this.

TABLE 21 : COMPARISON OF FATHER-CHILD Durations WITH THOSE FOR THE OTHER FOUR CARETAKER-CHILD PAIRS.

SOCIAL INTERACTION CATEGORY	Drtn FOR CT'S OTHER THAN FATHER	Drtn FOR FATHER	CELL WITH HIGHER RATE	DIFF
VISUAL COMMUNICATION				
TO CT	1.3	2.0	FATHER	0.6
TO CT + OTHER	0.7	0.7	-	-
TO OTHER	1.7	1.9	FATHER	0.2
VOCAL COMMUNICATION				
TO CT	10.8	12.0	FATHER	1.2
TO CT + OTHER	1.4	0.9	OTHER CT'S	0.5
TO OTHER	3.6	2.9	OTHER CT'S	0.7
TACTILE CONTACT				
TO CT	3.3	3.3	-	-
TO CT + OTHER	0.7	0.7	-	-
TO OTHER	0.7	0.7	-	-

Not only are there more categories in which the rates for children with father exceed overall rates than vice versa, but in those instances the differences between father and other caretakers is greater than in the reverse case.

3. Caretaker x age - none.

4. Caretaker x sex -

a) vocal interaction with caretaker - $(F(4,444) = 5.366,$

$p < .001, R^2 = .04)$. A significant main effects test indicated that the children who exhibited a sex difference in this category were

accompanied by nanny ($F(1,444) = 14.977, p < .001, R^2 = .16$) or peer's mother ($F(4,444) = 5.041, p < .05, R^2 = .19$). TABLE 22 details the mean rates of vocal interaction for each caretaker-sex combination. From this it is evident that females talk more with their nannies than do males; males talk more with peer's mother than do females.

b) touching caretaker - ($F(4,444) = 2.470, p < .05, R^2 = .02$). A significant main effects test indicated that children who exhibited a sex difference here were accompanied by nanny ($F(1,444) = 8.122, p < .01, r = .07$). TABLE 22 indicates that females touch nannies more than do males.

TABLE 22 : SOCIAL BEHAVIOURS EXHIBITING A CARETAKER X SEX INTERACTION
- MEAN D_r PER 4-MINUTE SAMPLE.

	MOTHER		NANNY		GRANDMOTHER		FATHER		PEER'S M.	
	M	F	M	F	M	F	M	F	M	F
VOCAL TO CT	10.07	10.42	8.92	13.14	15.90	10.04	10.66	15.78	5.98	3.42
TACTILE TO CT	3.28	3.50	2.55	4.03	3.38	3.04	3.10	3.64	2.13	1.29

4. Caretaker type x age x sex

a) vocal interaction with caretaker + other -
($F(4,444) = .001, p < .05, R^2 = .04$). Simple simple effects analysis was done in which the effects of age were examined for each of the 10 caretaker-sex combinations. The results of this, as indicated in FIGURE 8 reveal that males accompanied by peer's mother exhibited a sharper decline with age ($F(1,444) = 6.669, p < .01, R^2 = .33$) than did females accompanied by peer's mother ($F(1,444) = 5.697,$

$p < .05$, $R^2 = .19$).

5. Caretaker type x number of peers -

a) vocal interaction with other - ($F(4,444) = 4.279$, $p < .05$, $r = .04$). A significant main effects test indicated that children accompanied by grandmother ($F(1,444) = 7.099$, $p < .05$, $R^2 = .10$) were influenced by the number of peers. From TABLE 23 it is evident that these children are in vocal interaction with other increasingly as the number of peers increases.

TABLE 23 : VOCAL INTERACTION WITH OTHERS - MEAN Drtn PER 4-MINUTE SAMPLE ACCORDING TO NUMBER OF PEERS.

VOCAL INT. WITH OTHERS	MOTHER	NANNY	GRANDMOTHER	FATHER	PEER'S M
NO PEER	2.95	2.04	0.94	0.83	0.00
1 PEER	3.63	2.15	3.67	4.75	6.11
2 PEER	1.57	4.00	5.80	0.00	3.00
3 PEER	6.00	0.38	-	-	3.67
4 PEER	2.00	-	-	-	-

7. No effects involving caretaker type - none.

FIGURE 8 : Vocal interaction with caretaker + other according to age for males and females accompanied by peer's mother.

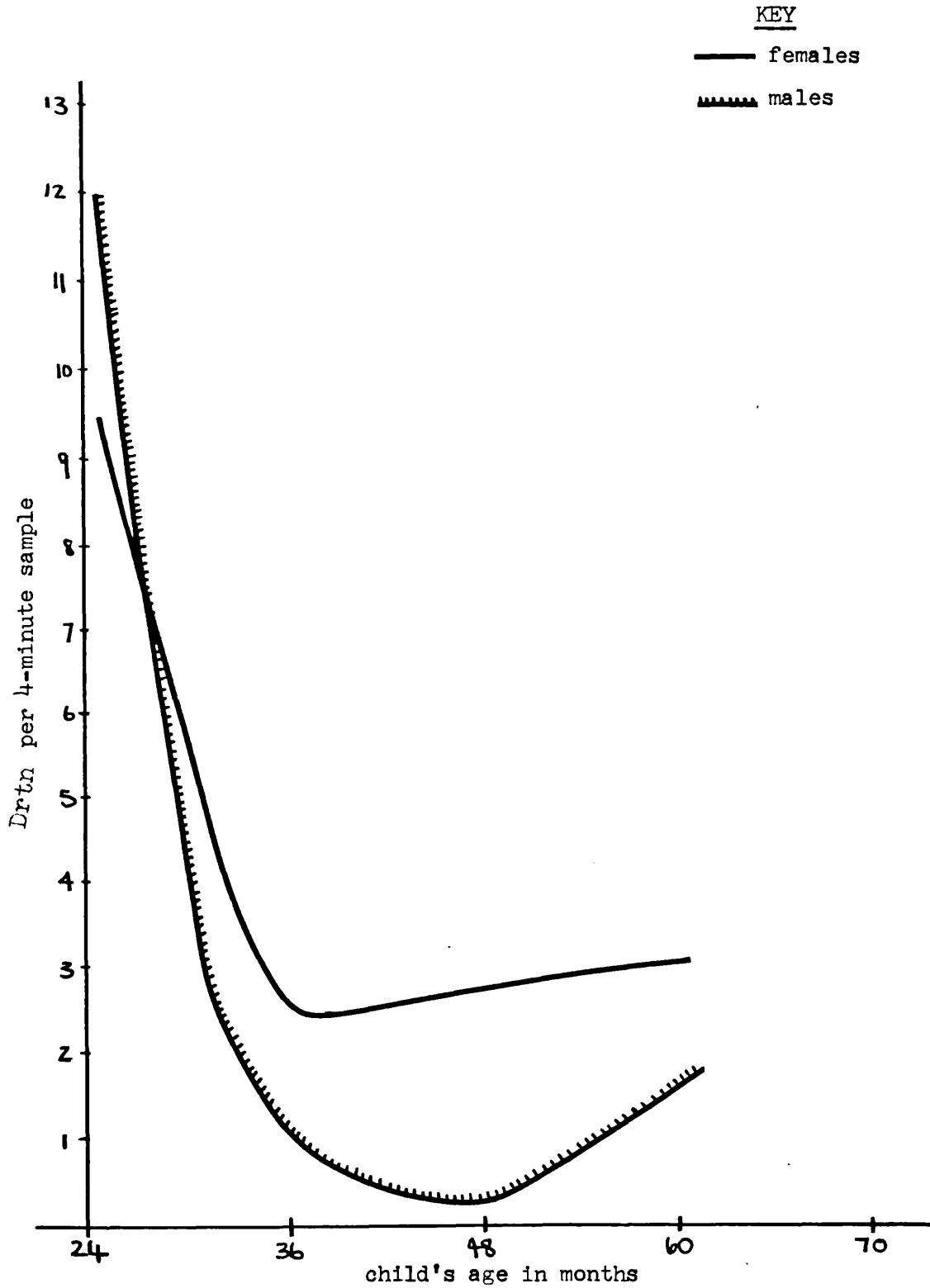


TABLE 24 : SUMMARY OF RESULTS FOR DIRECTION AND MODE OF SOCIAL BEHAVIOUR

MAIN EFFECT OF CARETAKER

1. VISUAL WITH CARETAKER - MOST OFTEN IN CHILDREN WITH NANNY OR FATHER.

- LEAST OFTEN IN CHILDREN WITH PEER'S MOTHER.

2. SOLITARY BEHAVIOUR - MOST OFTEN IN CHILDREN WITH MOTHER OR PEER'S MOTHER.

- LEAST OFTEN IN CHILDREN WITH FATHER.

SIGNIFICANT SIMPLE EFFECTS

SOCIAL BEHAVIOUR	INTERACTION TERM	DETAILS OF SIMPLE EFFECTS
VOCAL TO CARETAKER	CT X SEX	FEMALES MORE THAN MALES WHEN WITH NANNY
TOUCHING CARETAKER	CT X SEX	FEMALES MORE THAN MALES WHEN WITH NANNY
VOCAL TO OTHER	CT X PEER	INCREASES WITH MORE PEERS WHEN WITH GRANDMOTHER
VOCAL TO CARETAKER	CT X SEX	MALES MORE THAN FEMALES WHEN WITH PEER'S MOTHER
VOCAL TO CARETAKER + OTHER	CT X AGE X SEX	MALES SHOW A SHARPER DECLINE WITH AGE THAN FEMALES WHEN WITH PEER'S MOTHER

Children accompanied by their mothers spend more time alone than children accompanied by most other caretakers. Age, sex and number

of peers do not exert more marked effects on their social behaviour than they do on the behaviour of children with other caretakers.

Children accompanied by nanny spend more time in visual interaction with her than do children accompanied by most other caretaker types. Sex has a more marked effect on their social behaviour, in that females exhibit more vocal and tactile contact with her than do males.

When children are accompanied by grandmother, their vocal contact with other increases as the number of peers increase, but neither age nor sex exert more marked influences on their behaviour than they do for children accompanied by other caretakers.

Children accompanied by fathers spend more time in visual contact with him than do children accompanied by other caretakers. They also spend the least amount of time alone. Age, sex and number of peers do not exert more marked influences on their social behaviour than they do for other caretakers.

Children accompanied by peer's mother spend more time alone than do children with most other caretaker types. They also exhibit less visual interaction with caretaker. Sex and age of child exert an effect on social behaviour, first in that males are more often in vocal contact with peer's mother, second in that males show a sharper decline in vocal contact with peer's mother + other than do females.

D. Content of behaviour

This section comprises cooperative interaction with caretaker, cooperative interaction with other, apprehensive behaviour, aggressive behaviour.

1. Rarely occurring categories -

- a) apprehensive behaviour
- b) cooperative behaviour with other.
- c) aggressive behaviour.

2. Main effect of caretaker type - none.

3. Caretaker type x age - none.

4. Caretaker type x sex -

a) cooperative with caretaker - ($F(4,444) = 2.799, p < .05, R^2 = .03$). A significant main effects test indicated that sex of child influenced the amount of cooperative behaviour between mother and child ($F(1,444) = 4.848, p < .05, R^2 = .02$), and between grandmother and child ($F(1,444) = 4.453, p < .05, R^2 = .06$). TABLE 25 reveals that there is more cooperative behaviour between females and mother, while there is more cooperative behaviour between males and grandmother.

TABLE 25 : COOPERATIVE BEHAVIOUR WITH CARETAKER - MEAN Drtn PER
4-MINUTE SAMPLE ACCORDING TO CARETAKER TYPE AND SEX OF CHILD.

	MOTHER		NANNY		GRANDMOTHER		FATHER		PEER'S M.	
	M	F	M	F	M	F	M	F	M	F
COOPER. WITH CT.	5.01	7.15	8.13	9.24	9.82	5.40	7.45	11.79	3.54	1.24

5. Caretaker x age x sex - none.

6. Caretaker x number of peers -none.

7. No effect involving caretaker type - none.

TABLE 26 :SUMMARY OF RESULTS FOR COOPERATIVE CONTENT

SIGNIFICANT SIMPLE EFFECTS FOR EACH CARETAKER TYPE.

COOPERATIVE WITH CARETAKER	INTERACTION TERM	DETAILS OF SIMPLE EFFECTS
	CT X SEX	FEMALES MORE THAN MALES WHEN WITH MOTHER
	CT X SEX	MALES MORE THAN FEMALES WHEN WITH GRANDMOTHER

Format of discussion

Broadly speaking results will be discussed in two sections :

1. Activity.

2. Social Behaviour, which incorporates the findings of Initiations and Breaks of Contact, Direction and Mode of Social Behaviour, and Cooperative Content.

Results of two or more sections will be drawn together when this allows a point to be made more clearly. Discussion will be selective ie. not every significant caretaker effect will be discussed. Focus will be placed on those results which relate directly to other research in this area and/or results which elucidate clear-cut patterns in caretaker effect eg. where a similar caretaker effect shows up in two or more related categories.

1. Activity

The summary table for activity categories (TABLE 15) reveals that none of them exhibited a main effect of caretaker type. This points to the fact that there was no simple relationship between caretaker type and child's activity. Sex of child, age of child, and number of peers were the three variables chosen as the ones most likely to affect the relationship between caretaker type and activity. Since TABLE 15 also reveals that activity categories show more caretaker x sex effects than caretaker x age, caretaker x age x sex ,or caretaker x peers effects, sex of child seems to have been the most

pervasive in its effect on this relationship.

This relates to the finding (see TABLE 12) that some caretakers are more inclined to accompany males than females to the playground (viz. grandmother, father and peer's mother), while others accompany more females (viz. nanny) - $X(4) = 21.82, p < .001$. Thus caretakers will affect activity at the broadest level in deciding to bring the child to the playground, and at the playground itself in influencing what activities are participated in, with the form both these effects take being markedly affected by the child's sex.

The summary table also reveals that activities in which the effects of age and/or sex were dependent on caretaker type (ie. activities showing caretaker x sex, caretaker x age, caretaker x age x sex interactions) were large-swing play, slide play and unoccupied behaviour. Bearing in mind the whole range of activities open to children, slide and large-swing play comprise two of the most energetic activities, requiring a great deal of physical exertion and motor exercise; unoccupied behaviour on the other hand is probably the least active. Thus it seems that the effects of caretaker type were concentrated on the two extremes of activity .

That females exhibit more large swing play than males when accompanied either by mother or by peer's mother (see TABLE 13) suggests some degree of uniformity in the way young mothers differentially affect the activities of male and female children. It was usually difficult for preschool children to play on the large-swings without some adult assistance, since these swings were large

and very heavy to manoeuvre. It is possible that mothers and peer's mother were more willing to assist females than males. This possibility is partially substantiated by the finding that there is more cooperative interaction between mothers and females than between mothers and males (see TABLE 25) . Halverson and Inoff (1977) and McGurk and Lewis (1972) in their nursery studies also found that female children were more likely to initiate contacts involving requests for help from nursery teachers than were males, an initiation which mothers may be more responsive to than other caretakers.

Females accompanied by nannies spend more time in social play than do males (see TABLE 13). Social play can involve the child in interaction with caretaker, familiar child, unfamiliar child, unfamiliar adult, or any combination of these. Results from the Direction and Mode of Social Behaviour section (TABLE 22) suggest that the greater amount of social play exhibited by females with nanny is attributable to more social play between nanny and child, since females spend more time in vocal and tactile contact with nanny than do males. Two findings from the literature relate to this point. First, females prefer sustained interaction with a small number of partners, while males prefer briefer interactions with many partners (Garvey 1977; Waldrop and Halverson 1975; Freedman 1976). Second, males rely less on adult involvement in their play (Moskowitz et al 1977; Brookhart and Hock 1976; Blurton Jones 1972b), and spend more time away from caretakers in outdoor venues (Ley and Koepke 1982) . These findings suggest that female preschoolers show a greater preference for intimate and prolonged

interaction.

In the present study, children accompanied by nanny show clear evidence of this sex difference : females spend more time in contact with nanny but, as the summary table for initiations and breaks of contact suggests, (see TABLE 18), they do not differ from males in the number of initiations and breaks of contact made with her. This means that initiations are followed by longer bouts of interaction for females. However, the question remains as to why children with nannies exhibit this marked sex difference, whilst children with other caretakers do not.

As was mentioned in CHAPTER 8, there is a marked potential for intimate and prolonged interaction between nanny and child, since they spend a large proportion of their day alone together. This might be expected to enhance sex differences in that the potential for an exclusive and prolonged relationship would accord well with the social preferences of females, but be averse to the social preferences of males. This may explain why the child's sex exerts such an effect on the social activity of children accompanied by nanny.

Support for this argument comes from comparing the social interaction of children accompanied by peer's mother with those accompanied by nanny. As mentioned in CHAPTER 8, these two caretaker types are fundamentally different from one another in that peer's mothers usually accompany children to the playground as part of a larger caretaker group, whilst nannies are usually the child's only

caretaker. This probably means that there is considerably less opportunity for intense and exclusive interaction with peer's mother. Looking at details of social interaction (see TABLE 22), it is evident that the sex difference in vocal interaction with caretaker for children accompanied by nanny is completely reversed for children accompanied by peer's mother : males with peer's mother are in vocal contact with her significantly more often than are females. This could reflect the fact that peer's mother is much more novel and unfamiliar than nanny, which may appeal to males more. This should not, however, be taken to imply that males are in more vocal contact with caretaker when they are accompanied by peer's mother than when they are accompanied by nanny. The point is simply that sex differences in vocal interaction with caretaker are in opposite directions for males and females in these two groups .

Comparisons of nanny and peer's mother, like the ones just made, will prove useful in several parts of the discussion, since there are likely to be fundamental differences in the amount of time they spend with the child, and since familiarity and opportunity for intensive interaction have been found to be important in determining the nature of adult-child interactions (Field 1978). A second form of comparison carries equal weight viz. comparisons between children with nanny and children with mother. This comparison has quite the opposite advantage : these two caretakers are probably the most comparable in the intensity of their relationship with a child.

This second form of comparison proves fruitful for the current discussion about how the exclusiveness of relationships may affect

the child's social behaviour . As discussed in CHAPTER 8, all children (regardless of the caretaker accompanying them) spend considerably more time in interaction with caretaker than in interaction with others. However, for children with nanny, this preference seems weaker, in that these children initiate fewer contacts with nanny as the number of familiar peers increases (see TABLE 17). The most likely explanation for this is that nannies are less salient to children because they are available so often for interaction. Support for this possibility can be derived from looking at the child-initiates-with-caretaker data for children with other caretaker types (TABLE 17): the only other children who show a similar peer-related trend(although not significant) are those accompanied by mother. Thus the two caretakers likely to be in the most prolonged and exclusive contact with children seem to be the least salient relative to peers as regards the child initiating interaction with them.

Taking the results for categories of activity as a whole (SEE TABLE 15) nannies were more markedly affected by child's sex and age than other caretaker types were. This is evident from the fact that there were more categories in which age and/or sex of child affected activity. Put at its simplest, this may mean that nannies are more willing to 'let boys be boys, girls be girls' etc. - in other words they are more laissez-faire.

The term "laissez-faire" has also been used by Jeanne Altmann (1980) to describe baboon mothers who do not encourage attachment seeking from their infants, and often reject attempts at proximity seeking.

It is used in the present study in a somewhat different sense ,first in that it refers to more general aspects of behaviour , second in that a laissez-faire style of caretaking does not imply reduced contact between caretaker and infant - in fact it implies the opposite. However, the common thread is that the term describes a style of caretaking in which the adult is less likely to modify the infant's spontaneous behaviour. In baboon infants this means an increase in their infant's exploration and independence; in the children observed here it means an increased rate of contact with the caretaker. This would suggest that the comparison of maternal styles across different primate species is most fruitfully made when the maternal style is considered with reference to the infant's behavioural propensities, rather than as an entity in itself. In baboons a laissez-faire style may have very different consequences for infants than a laissez-faire style in nannies has for the children in their care, simply because the infant's natural abilities and interests are so different.

Further evidence for a laissez-faire style of caretaking in nannies may be gathered by comparing the effects of caretaker type on the activities of children accompanied by mother, with those accompanied by nanny (see TABLE 15). Children with mother show very similar patterns of activity regardless of age or sex. The activities of children with nanny are much more affected by these variables however. This suggests that mothers compensate more for any naturally occurring age or sex differences in children's activity.

Similarly, comparisons can be made between the social interaction

patterns of children with mothers and nannies. As has already been discussed, females spend more time in contact with nannies than do males, and this is seen as an effect of the exclusiveness of nanny-child relationships. The only other relationship which is probably comparable in this respect is that between mother and child. Here there was no sex difference in time spent interacting with caretaker (see TABLE 22). However, data on Initiations and Breaks of Contact reveal that mothers initiate more contacts with males (see TABLE 16) - a finding also reported for teacher-child interaction in nursery schools (Cherry 1975). This suggests that they may be compensating for the propensity of males to play independently. Nannies do not exhibit the same sex preference in initiating contact, suggesting that they are more willing to accept the child's social propensities as they are.

If this hypothesis is correct, the origins of a laissez-faire approach in nannies needs to be established. It may be that they are less sensitive to the naturally occurring age and sex differences children exhibit in their activity and social behaviour, and so cannot compensate for this. This seems unlikely however since most nannies are middle-aged women with children of their own (the mean estimated age of nannies in the present study was 36 years). Their daily contact with the child in their care gives them plenty of opportunity for getting to know one another. Another possibility is that they feel it of little importance to smooth over age and sex differences in children's behaviour. Nannies coming to the playground used in the present study were mainly Zulu women, and both Vilikazi (1965) and Lugg (1975) report that the traditional

mother-child roles in Zulu culture are greatly influenced by the child's sex, with closer relationships existing between mother and daughter than between mother and son. They may, therefore, be less inclined to draw males into interaction. Another alternative (and the one thought most likely) may be that they are less motivated to change the child's chosen activity or social behaviour : on a salary which was almost certainly less than 60 pounds sterling per month, and with a wide range of household duties included in their daily routine, they are likely to have felt less intrinsic interest in the child's progress and development than most other caretaker types.

Whatever, the reasons though, there seems to be fairly firm evidence for the effect of nannies on children's behaviour being rather different from the effect of other caretakers.

Other research studies dealing with the influence of caretaker type on activity have compared children with mother and children with father. These have reported more gross physical activity for children with father and more sedentary intellectual activity for children with mother (Lynn and Cross 1974; Parke and o'Leary 1976; Clarke-Stewart 1978). However, in the present study children showed similar patterns of activity regardless of whether they were with mother or father (see TABLE 15). This is perhaps because the playground offered much more scope for gross physical activity. Short of a caretaker and child playing a sedentary game, or bringing along a book or small toy (which was rare), there were no facilities for sedentary intellectual play. Added to this, it is likely that children were brought to the playground so that they could run about

and actively explore. Thus, any potential differences between mothers and fathers in the activities they preferred to involve the child in were probably masked.

2. Children's Social Behaviour

As with the data on children's activity, there are more caretaker x sex effects for children's social behaviour than any other effect (see TABLE 24). This means that the relationship between caretaker type and social behaviour is most pervasively influenced by the child's sex.

That sex of child should prove so important in determining caretaker effects for both activity and social behaviour categories is an interesting point. Although more on the basis of intuition than hard fact, it was expected that children's age would be more important in determining the relationship between type of caretaker and children's behaviour. Since the children observed varied so widely in age and since there are substantial differences in the capabilities of, for example, one year old and five year old children, it was expected that some caretaker types might adapt more readily to children's age-related capacities than others.

One possible explanation for this not having been found was that those caretakers who were likely to have less sustained and regular contact with children would also be less likely to bring children at the extremes of the age range - especially very young children. This

would have confounded any caretaker x age effects. Although there is a slight hint of this in TABLE 12, eg. peer's mothers bring children from 25 to 60 months, whereas mothers bring children from 5 to 65 months, the mean age of children with different caretaker types did not differ substantially, nor did the interquartile ranges (22-41 months for children with mother, 27-48 months for children with peer's mother).

Thus the finding that age of child did not have markedly different effects on activity or social behaviour depending on who accompanied the child seems to stand. This does not imply that age of child per se was not a salient determinant of child behaviour in the playground - on the contrary, the background data contained in CHAPTER 8 (see TABLES 7 to 11) reveals that the main effects of age were significant more often than the main effects of either sex or number of peers. Rather that the effect was largely the same regardless of caretaker type.

What this implies is that the cues which children emit as regards their age-related capabilities are so clearcut that a wide range of caretakers (who probably differ substantially both in their experience with children in general and their experience with the focal child in particular), can interpret and respond to them equally well. This is also suggested by Snow's (1972) work on the modifications adults make to their speech patterns when talking to children. She found experienced mothers to be only slightly better than nonmothers in predicting the speech-style modifications required by two-year-old and ten-year-old children. Similarly, Lamb (1977b) reports age of child as having the same effect on children's interactions with mother, father and stranger. Child's sex, by

comparison, may not have presented all caretakers with the same sort of cues.

Although the evidence here is highly speculative, it suggests that, when children are in the presence of familiar adults, it is not the child's sex per se which is responsible for sex differences in behaviour but rather the interaction between child's sex and caretaker type. This has been found in comparative studies of social interaction between mother and child, and father and child (Belsky 1979; Fagot 1974; Lamb 1977b; Lewis 1972), and also in comparative studies of male and female teachers in interaction with children of both sexes (Perdue and Marant 1978). In all cases, the interaction effect has been interpreted in terms of the sex of adult:sex of child relationship. The data from the present study suggests that this may be too simple an explanation, since sex of child can affect different female caretaker types in different ways. It is not therefore, a simple case of sex roles, with women having different effects on boys and girls than do men, but rather of different caretaker roles in which the sex of child:sex of adult relationship is only one of a number of salient features.

As regards the ratios of caretaker initiates:child initiates, and caretaker breaks:child breaks showing no effects involving caretaker type, this is in keeping with Tizard et al (1980) who report no differences in the proportions on initiations children make to mother and nursery teacher.

As regards the direction of children's social behaviours, there were

three alternatives : interaction with caretaker, interaction with other, and interaction with caretaker + other. It was found (see TABLE 24) that the effect of caretaker type (whether a main effect or in interaction with other variables) was most important for interaction with caretaker. This was to be expected, but is nevertheless an important point. It means that the effect of caretaker type is not broad-ranging in how it influences children's social experience, since it rarely influences anything other than the immediate interaction between caretaker and child.

As regards the three modes of interaction, vocal was most often affected by caretaker type (see TABLE 24). This was not expected, since several research studies have found the child's use of the tactile mode the most important in distinguishing one type of adult-child relationship from another. Thus children are reported as seeking more tactile contact with mother than father and more contact with parents as opposed to strangers (Ban and Lewis 1971; Cohen and Campos 1974) .One important difference between these studies and the present one was that caretakers were asked not to initiate contact with the child in the former, whilst there were no constraints on interaction in the latter. It is possible then, that the number of child-initiated tactile contacts made in the present study was indeed greater for children with some caretaker types than others, but that all caretaker types showed an equal propensity for making tactile initiatives of their own ie. all caretakers types were equally likely to pick the child up, invite hand-in-hand walking, or support the child on apparatus. The tendency for children to seek tactile contact more with some caretakers than

others may thus have been masked by the category system's not distinguishing child-initiated from adult-initiated tactile contacts. This possibility is supported by Lamb's(1977c) finding that children with their parents in laboratory settings (in which parents were asked not to initiate contact) showed a preference for proximity to mother; the same children at home, (where no such constraints were placed on initiating contact) did not show the same preference. Lamb suggests that this resulted from fathers in the laboratory inhibiting their inclination to be active and playful - the qualities which make them salient to their children at home.

Perhaps the different forms of tactile contact could have been discriminated during observations, with distinction being made between a child's seeking tactile comfort (eg. climbing unaided onto caretaker's lap) and the more general forms of tactile interaction (eg. being held upright on a fast moving roundabout).

Looking now at children accompanied by mothers and fathers (see TABLE 24), it is interesting to note that these two caretakers are the only ones who exert similar influences on children regardless of the child's age, sex, or the number of peers (ie. they are the only ones for whom there are no caretaker x age, caretaker x sex, caretaker x age x sex, or caretaker x number of peers interaction effects). In addition the most prominent main effect of caretaker type for mothers and fathers is in the same category viz. solitary behaviour. Taken together, these two findings suggest two points.

First, that mothers and fathers are better than other caretakers at 'smoothing out' naturally occurring age, sex, or situational differences in children's social propensities. This may be a reflection of their more intimate knowledge of the child, coupled with a greater interest in the child's developmental status. If this argument were correct, then of the other 3 caretaker types one would expect grandmothers to be least affected by age, sex and number of peers, since it could be argued that her interest in the child's developmental status would be closest to that of mother and father. Examination of TABLE 24 shows exactly this linear ordering.

The findings here are in disagreement with several studies in which fathers are reported to show more interest in sons than daughters, whilst mothers show no preferences (Kotelchuck 1973; Gewirtz and Gewirtz 1968; West and Konner 1976). However the present study reveals many more fathers bringing sons than daughters to the playground (see TABLE 12). Thus it may be that fathers who bring daughters are a highly self-selected group, namely those who find interaction with their daughters more than usually enjoyable.

Secondly, mothers and fathers influence social behaviour in similar ways insofar as they exert an influence on the amount of time a child spends alone. However, the exact nature of this effect is quite different. Children with mothers spend more time alone than children accompanied by most other caretakers whilst children accompanied by father spend the least time alone (see TABLES 20a and 20b). Their influence is in quite different directions.

That children with fathers are more gregarious than other children relates to past research in which fathers have been found to interact more intensively with their children than do mothers (Lamb 1977c), and children to enjoy interacting with father more too (Clarke-Stewart 1978) . This has been explained in terms of fathers having less opportunity for interaction with their children, and compensating for this by using the available time more intensively. The present study suggests that this increased interaction takes the form of a trend towards more social interaction across several categories (see TABLE 21), with visual interaction being the only one which reached significance (see TABLE 19a and 19b). Thus, the cumulative effect was markedly less solitary behaviour.

Thus the fact that children with fathers spend less time alone than do children with mothers might suggest a more intensive form of interaction between father and child in a playground venue.

However, it is worth noting again that, although there were several categories of social behaviour in which children with fathers seemed more gregarious than other children, the only category in which this difference reached significance was visual contact with caretaker. Since this is usually in the form of smiling, waving or pointing, it is usually a simple and brief form of contact. As such, the fact that children with father spend less time alone does not necessarily imply that their social experience is richer. Nor should it be seen as necessarily better for the child to be in more frequent contact with a caretaker - although solitary play was originally conceived of as impoverished by comparison with social play (Parten 1932),

recent research indicates that it can be just as mature and complex as the more social forms of play (Moore et al 1974; Rubin et al 1976; Roper and Hinde 1978; Smith 1978).

This simple form of signalling (ie. visual interaction with caretaker) also occurred more in children with nanny (see TABLES 19a and 19b). This may reflect the fact that nannies are less familiar with English than other caretakers, which might mean that the nanny-child pair rely more on visual signals. This seems unlikely, however, since it would be reflected in a converse main effect of caretaker type for vocal interaction involving nanny and child. This was not found. Instead, only males accompanied by nanny showed significantly lower than average rates of vocal contact with caretaker (see TABLE 22). What this suggests is that visual contact with caretaker serves as a supplement to other forms of interaction for females with nannies, but as a substitute for other forms in males with nannies, possibly resulting in a simpler form of interaction between male and nanny.

Children with mother and peer's mother share fairly similar patterns of social behaviour, at least with respect to the amounts of time they spend alone. This suggests a similarity in the way young mothers affect children, just as was evident in caretaker effects for activity categories. However, with respect to the more intense forms of social interaction, it is interesting to note that sex of child influences vocal interaction with peer's mother, age x sex influences vocal interaction with peer's mother + other, whilst there are no such interaction effects for children with mother. This

not only provides further evidence of how a caretaker's familiarity with a child affects his or her ability to compensate for naturally occurring differences in the child's ability but also suggests that the importance of such familiarity is more clearly evident in some of the more intense aspects of social behaviour. The importance of familiarity is also suggested by Anderson's (1972a) finding that children are in tactile contact (cuddling, grooming, sitting on lap etc.) almost exclusively with their mothers, even in settings where a friend of mother's is also available for tactile contact.

Concluding remarks

It is clear that child, adult and situational variables all contributed to the effects of different caretaker types on children's activity and social behaviour. Broad characteristics of the child, especially child's sex, are of importance in determining these effects; the caretaker's interest in the child, and sensitivity to the child's ability and preferences seem equally powerful; differences in their familiarity with one another are likely to influence their interaction; the playground itself may have placed constraints on the choice of activities, masking potential differences in the preferences different caretaker types may have had in guiding the child's activity; to a more limited extent, the number of children with the adult and child can also be seen as exerting different influences on different caretaker-child combinations.

Taken as a whole, these findings may seem inconsistent with other studies, in which differences between mother-child and father-child interactions and activities are attributed almost exclusively to differences in caretaker behaviour (Lamb 1977b; Clarke-Stewart 1978; Belsky 1979). However, it is almost certain that this is merely due to a difference in the levels of description which were used : previous studies do not ignore the possibility of child and situational variables being important - they simply see their effects as being filtered through the caretaker. Thus the child's sex is considered important only insofar as mother and father respond differently to it. The present study cannot make statements at this more complex level because the relative contributions of adult and child were not distinguished. Whilst this was a direct consequence of observations being made in a field setting, it should also be said that this clear cut division into caretaker versus child contributions was not deemed as appropriate as the more holistic approach in which the caretaker effect could be described in terms of the child's broad experience. It is debateable, for example, whether the sub-division of verbal behaviour into 'adult talks' and 'child talks' is more powerful as a descriptive tool than how much verbal interaction with adults a child experiences. Whilst such sub-divisions may invite explanations about the origins of differences in interactions in terms of one partner contributing more than another, it seems dubious to assume that the two contributions can be meaningfully split up in this fashion - social interaction is, by definition, a sequencing of two or more sets of signals in which the signals of each partner may modify the signals

of the other and thus the course of interaction. To talk in terms of isolating one contribution from another may therefore be misleading. Thus the apparent inconsistency between the present study and previous research is most likely the result of differences in emphasis : the present study emphasising a broad description of children's experience, and believing definitive statements about the mechanisms underlying interaction to be beyond the realms of pilot field work; past research attempting to use only marginally more detailed descriptions in an attempt to uncover the origins of differences.

As regards any indications of monotropy, there is certainly evidence that some aspects of children's social behaviour and activity are affected differently by mothers as opposed to other caretakers. However, there are just as many 'unique ' effects of caretaker type for children with fathers, nannies and peer's mother; children with grandmother, on the other hand, are almost as conspicuous by the absence of any marked caretaker effects. Nor is there any sign of children with different caretakers behaving differently before and after three years old as Bowlby's theory might suggest. However, there is evidence of probable differences in familiarity between caretaker and child affecting children's behaviour, which is concordant with Bowlby's theoretical statements. It is, nevertheless true to say that similarities far outweigh differences. To some extent, then, each caretaker type has some unique influences on children's behaviour and social activity, but none much more markedly than another.

CHAPTER 11: CHILDREN WITH TWO CARETAKERS

11:1 INTRODUCTION

In 1974, Bronfenbrenner published an article which has since been quoted scores of times in papers dealing with children's social development. In it, he stated that 'extradyadic factors' must be looked at so as not to distort our knowledge of adult-child interaction. The statement was made in reaction against the exclusively dyadic focus of most child research. Having established in the previous two chapters that different caretakers have different effects on children's behaviour, the next two chapters aim to look at extradyadic factors in order to see whether they change the nature of dyadic relations between caretaker and child.

The chapters focus on a comparison of children's behaviour when they are with one caretaker (the dyadic condition), with children's behaviour when they are with two caretakers (the triadic condition) - the terms 'dyadic' and 'triadic' are used as a convenient shorthand, as there are often siblings and/or peers present too.

To make such a comparison, the search for triads had to be limited to caretaker types that had already been included in the dyadic analyses. In the same way as the dyads, a limit of 18 4-minute samples per triad was selected as the minimum number that would be handled statistically. TABLE 27 details children in the 3 triads

that met these two criteria. In total these samples represented 16.61% of the samples collected.

TABLE 27 : CHILDREN WHO WERE ACCOMPANIED BY TWO CARETAKERS - NUMBER OF 4-MINUTE SAMPLES AND SUBJECT DETAILS.

CARETAKERS	NO. OF SAMPLES	SAMPLES BY SEX		MEAN AGE IN MTHS.	AGE RANGE	RANGE IN NO. PEERS	MEAN NO. PEERS
		M	F				
Mother + Grandmother	69	35	34	37	10-65	0-2	1.0
Mother + Father	60	31	29	34	5-70	0-3	0.6
Mother + Peer's mother	19	7	12	30	10-50	0-3	1.8

Two key questions were asked of these comparisons:

A. Using mother-child dyads as a baseline - does a second caretaker change the child's social behaviour and activity. If it does, is the change dependent on the type of caretaker that is "added" (see footnote)?

The term "added" is used as a convenient shorthand. It does not imply the actual addition of a second caretaker, but a comparison of children in caretaker-child dyads with children in caretaker-caretaker-child triads.

The following comparisons were made:

DYAD		TRIAD
1.	Mother - child	Mother - grandmother - child
2.	Mother - child	Mother - father - child
3.	Mother - child	Mother - peer's mother - child

B. Using grandmother - child, father - child, and peer's mother - child dyads as baselines - does the child's social behaviour and activity change when the mother is "added"? If so, is the change the same regardless of the caretaker-child pair she is added to? The following comparisons were made:

DYAD		TRIAD
4.	Grandmother - child	Mother - grandmother - child
5.	Father - child	Mother - father - child
6.	Peer's mother - child	Mother - peer's mother - child

11:2 OUTLINE OF RESULTS PRESENTATION

Questions A and B have been dealt with separately. The layout for each question is much the same as in CHAPTER 9 : four different aspects of behaviour were coded (Activity, Initiations and Breaks of Contact, Direction and Mode of Social Behaviour, and Cooperative Interaction with Caretaker); in both A and B each aspect is dealt with one at a time. Categories of behaviour which occurred too rarely for analysis in CHAPTER 9 were excluded from the present analysis.

The analyses proper are presented according to the 5 sorts of group composition effect that were examined (main effect of group composition, group composition x age interaction, group composition x sex interaction, group composition x age x sex interaction, group composition x number of peers interaction); a sixth section includes all categories in which no effect involving group composition was found. For activity, results were not broken down into the several types of apparatus, since this would have been long-winded. Instead, activity is broken down into only 3 categories - apparatus play, social play, unoccupied.

Question A

The three comparisons involved in this question were analysed in a single multiple regression analysis - with a group composition factor having four levels : mother-child, mother-grandmother-child, mother-father-child, mother-peer's mother-child. As in CHAPTER 9, the regression was performed on log transformations of frequencies.

The order in which variables were entered into the regression was as follows:

age of child

sex of child

age x sex

group composition

group composition x age

group composition x sex

group composition x age x sex

number of peers

group composition x number of peers

As with analysis in CHAPTER 9, the main effects of age, sex, number of peers are included as blocking variables to reduce the error variance.

Where the overall effect of group composition was significant, three follow-up tests were performed to compare the mother-child 'dyadic' composition with each of the three 'triadic' compositions that were of interest. As with CHAPTER 9, results are presented in terms of the 5 group composition effects that were of interest, with a summary at the end of each sub-section in which significant results are presented according to the three dyad-triad comparisons.

Results are presented in SECTION 11:3:A.

Question B

Each of the three comparisons were run in separate multiple regression analyses, ,since each comparison involved unique data. Thus, a significant effect could be directly followed up.

As for question A, a multiple regression analysis was performed on log transformations of frequencies. Group composition (dyad and triad), age, sex and number of peers were included as independent variables and the order was kept the same as before.

Results are presented for the three dyad-triad comparisons separately, each comparison ending with a summary of results. Results for Grandmother-groups are presented in SECTION 11:3:B:i. Results for Father-groups are presented in SECTION 11:3:B:ii. Results for Peer's Mother-groups are presented in SECTION 11:3:B:iii.

A. Activity

1. Main effect of group composition - none.

2. Group composition x age -

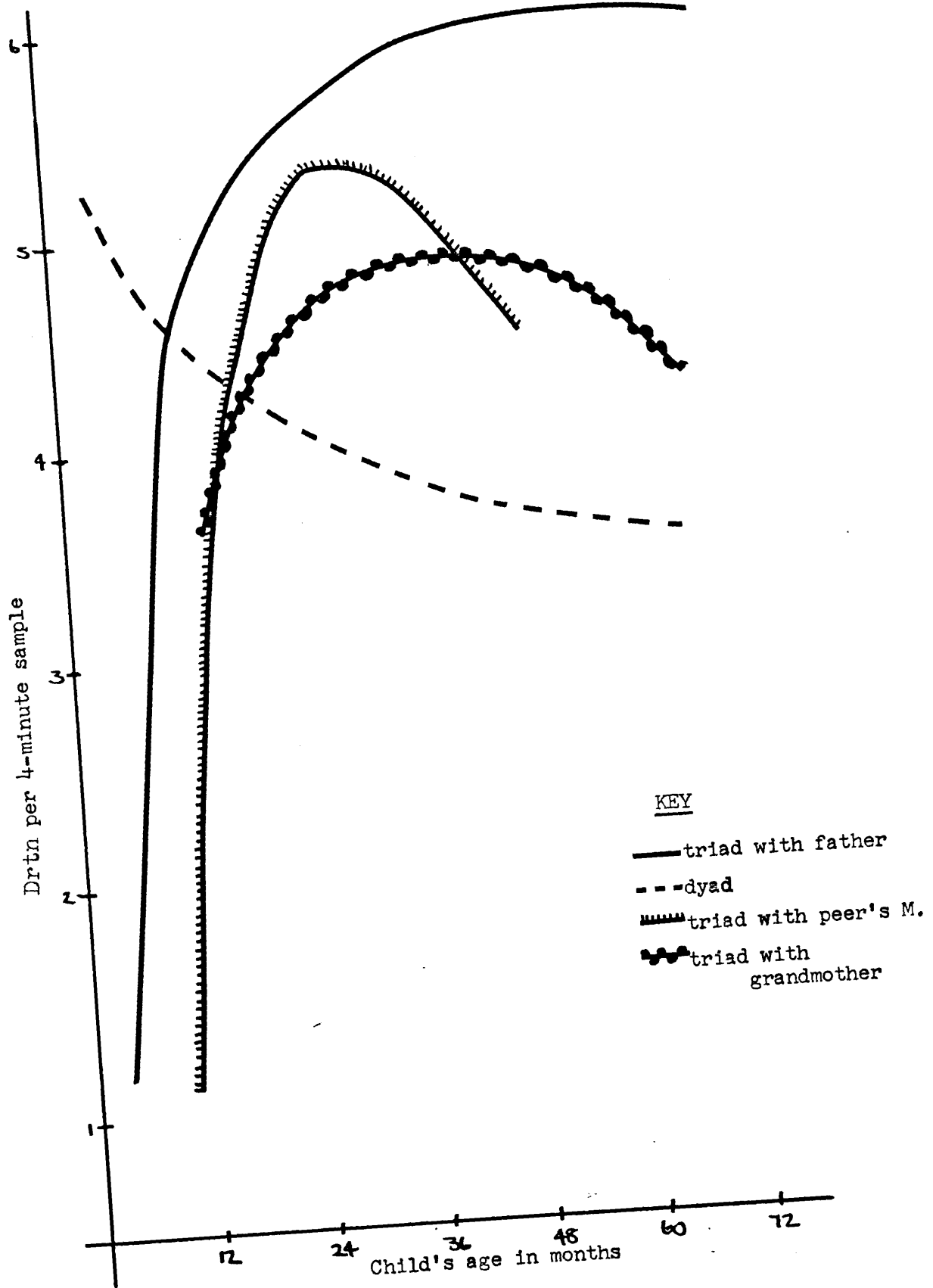
a) unoccupied - ($F(3,365) = 2.77, p < .05, R^2 = .02$). A significant main effects test indicated that all three dyad-triad comparisons were significant : mother vs.grandmother-mother ($F(2,365) = 3.99, p < .05, R^2 = .02$); mother vs. father-mother ($F(2,365) = 3.64, p < .05, R^2 = .02$); mother vs.peer's mother ($F(2,365) = 3.52, P < .05, R^2 = .02$). Plotting the data for the dyad and three triads revealed that mother-child dyads showed a steady decrease in unoccupied behaviour with age. Children with all three triads, however, showed the reverse ie. an increase with age. (see FIGURE 9).

4. Group composition x sex - none.

5. Group composition x age x sex -

a) apparatus play -($F(3,365) = 2.80, p < .05, R^2 = .02$).Simple interaction tests revealed an age x group composition effect for males only ($F(3,365)=3.33, p < .01, R^2 = .05$). Further follow-up tests were therefore confined to males. These revealed that the mother-child dyad was significantly different from the mother-grandmother-triad($F(2,365) = 4.31, p < .05, R^2 = .05$) and from the

FIGURE 9 : Unoccupied behaviour according to age for mother-child dyad and all triads.



mother-father triad($F(2,365) = 6.62, p < .01, R^2 = .05$). Plotting the curves for males in the dyad and these two triads reveals apparatus play in the dyad to be fairly constant with age; in mother-grandmother triads apparatus play peaks at about three years old and decreases slowly thereafter; in mother-father triads apparatus play shows a very steady and steep decline with age (see FIGURE 10).

5. Group-composition x number of peers - none.

6. No effect involving caretaker type -

a) social play.

FIGURE 10 : Apparatus play according to age for males
in mother-child dyads, mother-father-child
triads, and mother-grandmother-child triads.

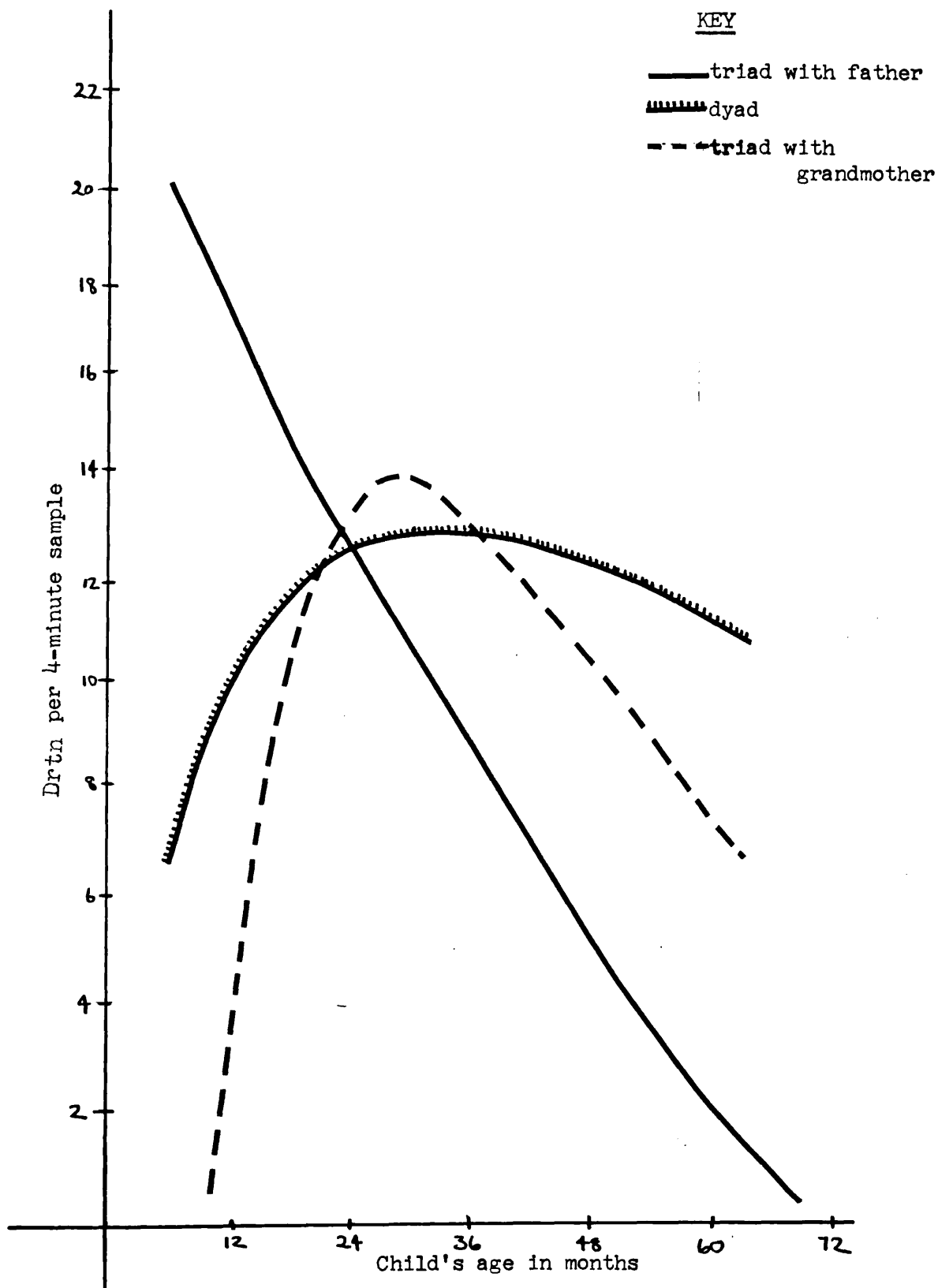


TABLE 28 : SUMMARY TABLE - ACTIVITY

SIGNIFICANT SIMPLE EFFECTS FOR EACH GROUP COMPOSITION

ACTIVITY	MOTHER-CHILD DYAD CONTRASTED WITH	INTERACTION TERM	DETAILS OF SIMPLE EFFECTS
APPARATUS PLAY	MOTHER-GRANDMOTHER-CHILD	GROUP COMP. X AGE X SEX	MORE WITH AGE TO 3YRS THEN LESS WITH AGE FOR MALES IN TRIAD.
	MOTHER-FATHER-CHILD	GROUP COMP. X AGE X SEX	DECREASES WITH AGE FOR MALES IN TRIAD
UNOCCUPIED	MOTHER-GRANDMOTHER-CHILD	GROUP COMP. X AGE	DECREASES WITH AGE IN DYAD. INCREASES WITH AGE IN TRIAD.
	MOTHER-FATHER-CHILD	GROUP COMP. X AGE	DECREASES WITH AGE IN DYAD. INCREASES WITH AGE IN TRIAD.
	MOTHER-PEER'S M.-CHILD	GROUP COMP. X AGE	DECREASES WITH AGE IN DYAD. INCREASES WITH AGE IN TRIAD.

B. Initiations and Breaks of Contact

1. Main effect of group composition - none.

2. Group composition x age - none.

3. Group composition x sex - none.

4. Group composition x age x sex -none.

5. Group composition x peer -

a) caretaker initiates with child $-(F(3,365) = 3.10, p < .05, R^2 = .02)$. A significant main effects test revealed that the mother-child dyad was significantly different from the mother-father triad $(F(2,365) = 5.19, p < .01, R^2 = .03)$. TABLE 29 reveals that children with peers experience more caretaker initiations in the mother-father triad than in the dyad.

TABLE 29 : CARETAKER INITIATES WITH CHILD FOR MOTHER-CHILD DYAD AND MOTHER-FATHER TRIAD - MEAN Freq. PER SAMPLE

	MOTHER-CHILD DYAD	MOTHER-FATHER TRIAD
NO PEER	1.10	0.81
1 PEER	1.01	1.36
2 PEER	1.08	1.62
3 PEER	1.05	1.50

b) child breaks contact with caretaker - $(F(3,365) = 3.65,$

$p < .05$, $R^2 = .03$). A significant main effects test revealed that the mother-child dyad was significantly different from the mother-peer's mother triad ($F(2,365) = 6.65$, $p < .01$, $R^2 = .01$). TABLE 30 reveals that children with no peers break contact with caretakers more often in the dyad.

TABLE 30 : CHILD BREAKS WITH CARETAKER FOR MOTHER-CHILD DYAD AND MOTHER-PEER'S MOTHER TRIAD - MEAN *Freq.* PER SAMPLE

	MOTHER-CHILD DYAD	MOTHER-PEER'S MOTHER TRIAD
NO PEER	1.18	0.49
1 PEER	1.21	1.60
2 PEER	0.88	0.59
3 PEER	0.77	0.82

6. No effect involving caretaker type -

- a) caretaker breaks with child
- b) child initiates with caretaker
- c) ratio of child initiates : caretaker initiates
- d) ratio of child breaks : caretaker breaks

TABLE 31 : SUMMARY TABLE - INITIATIONS AND BREAKS OF CONTACT

SIGNIFICANT SIMPLE EFFECTS

INITIATION/BREAK	MOTHER-CHILD DYAD CONTRASTED WITH	INTERACTION TERM	DETAILS OF SIMPLE EFFECTS
CT. INITIATES WITH CHILD	MOTHER-FATHER -CHILD	GROUP COMP. X NO. PEERS	PEER PRESENCE ASSOCIATED WITH MORE INITIATIONS IN TRIAD.
CHILD BREAKS WITH CT.	MOTHER-PEER'S M. -CHILD	GROUP COMP. X NO. PEERS	PEER ABSENCE ASSOCIATED WITH MORE BREAKS IN DYAD.

C. Direction and Mode of Social Behaviour

1. Main effect of group composition

a) vocal interaction with caretaker $-(F(3,365) = 11.14, p < .001, R^2 = .08)$. Mean rates per 4-minute sample are presented on TABLE 32. Results of a follow-up test using Scheffé's S-method for the three dyad-triad comparisons revealed that all three triads differed significantly from the dyad - for all three there was less vocal interaction with caretakers in triads than in the mother-child dyad.

TABLE 32 : VOCAL INTERACTION WITH CARETAKER - MEAN Drtn PER 4-MINUTE SAMPLE.

	MOTHER-CHILD	MOTHER-CHILD GRANDMOTHER	MOTHER-CHILD FATHER	MOTHER-CHILD PEER'S M.
MEAN RATE	10.24	7.02	5.76	3.88

b) vocal interaction with caretaker + other - $(F(3,365) = 3.45, p < .05, R^2 = .03)$. Mean rates per 4-minute sample are presented on TABLE 33. Follow-up tests using Scheffé's S-method revealed that the mother-child dyad differed significantly from the mother-father triad. Thus there was less vocal interaction with caretakers + other in the mother-father triad than in the dyadic condition.

TABLE 33 : VOCAL INTERACTION WITH CARETAKERS + OTHER - MEAN Drtn
PER 4-MINUTE SAMPLE.

	MOTHER-CHILD	MOTHER-CHILD GRANDMOTHER	MOTHER-CHILD FATHER	MOTHER-CHILD PEER'S M.
MEAN RATE	1.41	1.59	0.78	1.87

2. Group composition x age effect -

a) touching caretakers - ($F(3,365) = 4.52, p < .01, R^2 = .03$).

A significant main effects test indicated that all three dyad-triad comparisons were significant : mother vs. grandmother-mother ($F(2,365) = 6.09, p < .05, R^2 = .03$) mother vs. father-mother ($F(2,365) = 6.63, p < .05, R^2 = .03$); mother vs. peer's mother ($F(2,365) = 7.10, p < .05, R^2 = .03$). Plotting the data for the dyad and three triads revealed that dyad and triads all showed a decrease in touching caretaker with age but the dyad showed a much more marked decrease than any of the three triads (see FIGURE 11).

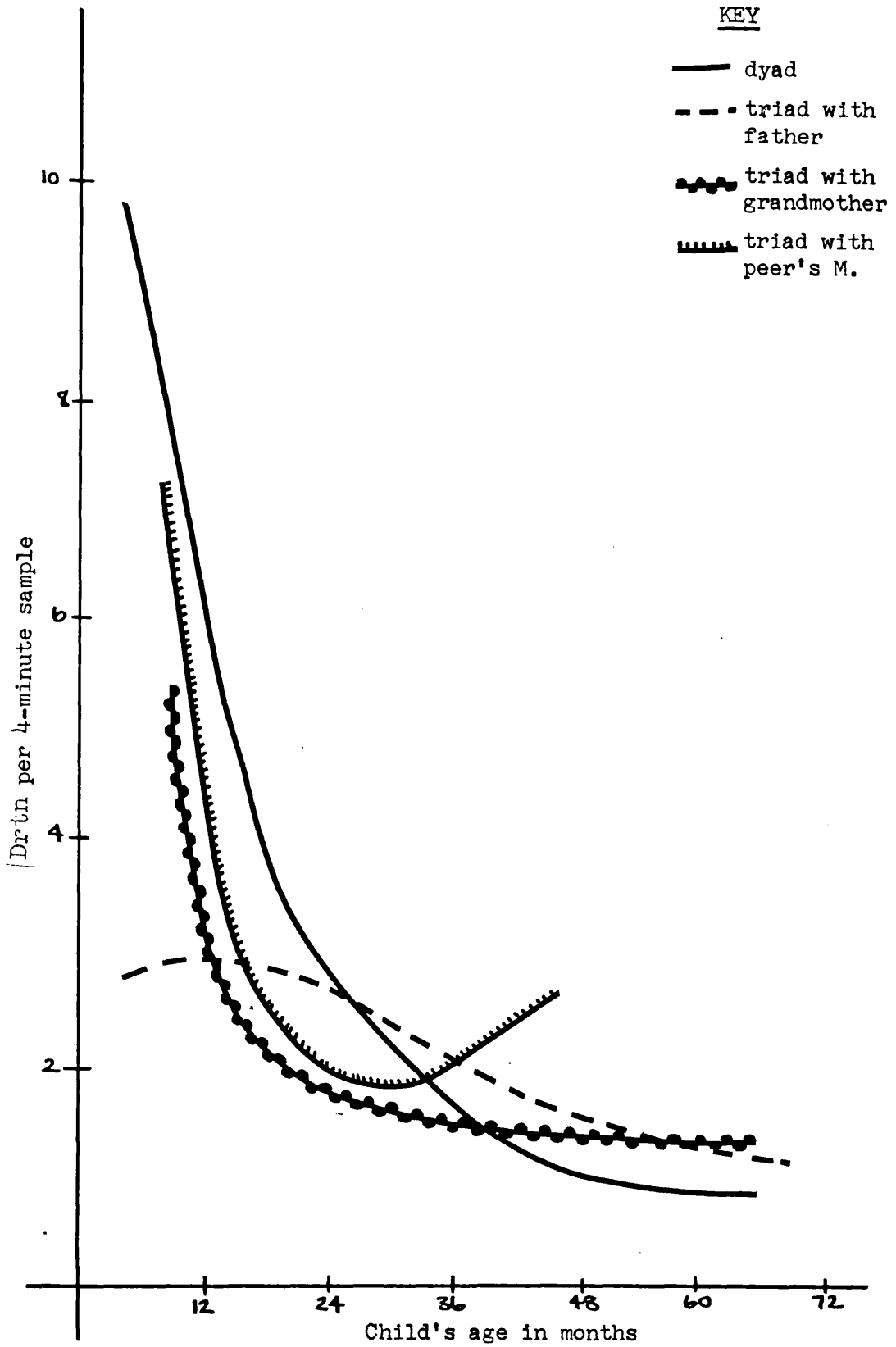
3. Group composition x sex -

a) vocal interaction with other - ($F(3,365) = 2.71, p < .05, R^2 = .02$). The follow-up main effects test was not significant here though, which meant that the group composition x sex interaction was not occurring in the three dyad-triad comparisons that were of interest.

4. Group composition x age x sex -

a) visual interaction with caretaker + other - ($F(3,365) = 2.66, p < .05, R^2 = .02$). Simple interaction tests revealed an group composition x age effect for males only ($F(3,365) = 4.289, p < .01,$

FIGURE 11 : Touching caretaker according to age for mother-child dyads, mother-father-child triads, mother-grandmother-child triads, and mother-peer's mother-child triads.



$R^2 = .06$). Further follow up tests were therefore confined to males. These revealed that the mother-child dyad was significantly different from the mother-peer's mother triad ($F(2,365) = 6.60$, $p < .05$, $R^2 = .07$). Plotting the curve for males in the dyad revealed no change in vocal to other with age; the related curve for the mother-peer's mother triad revealed an overall decrease with age (see FIGURE 12).

5. Group composition x number of peers - none.

6. No effect involving group composition -

- a) visual interaction with caretaker.
- b) tactile to caretaker + other.
- c) solitary behaviour.

FIGURE 12 : Visual interaction with caretaker + other
for males in mother-child dyads and males
in mother-peer's mother-child triads.

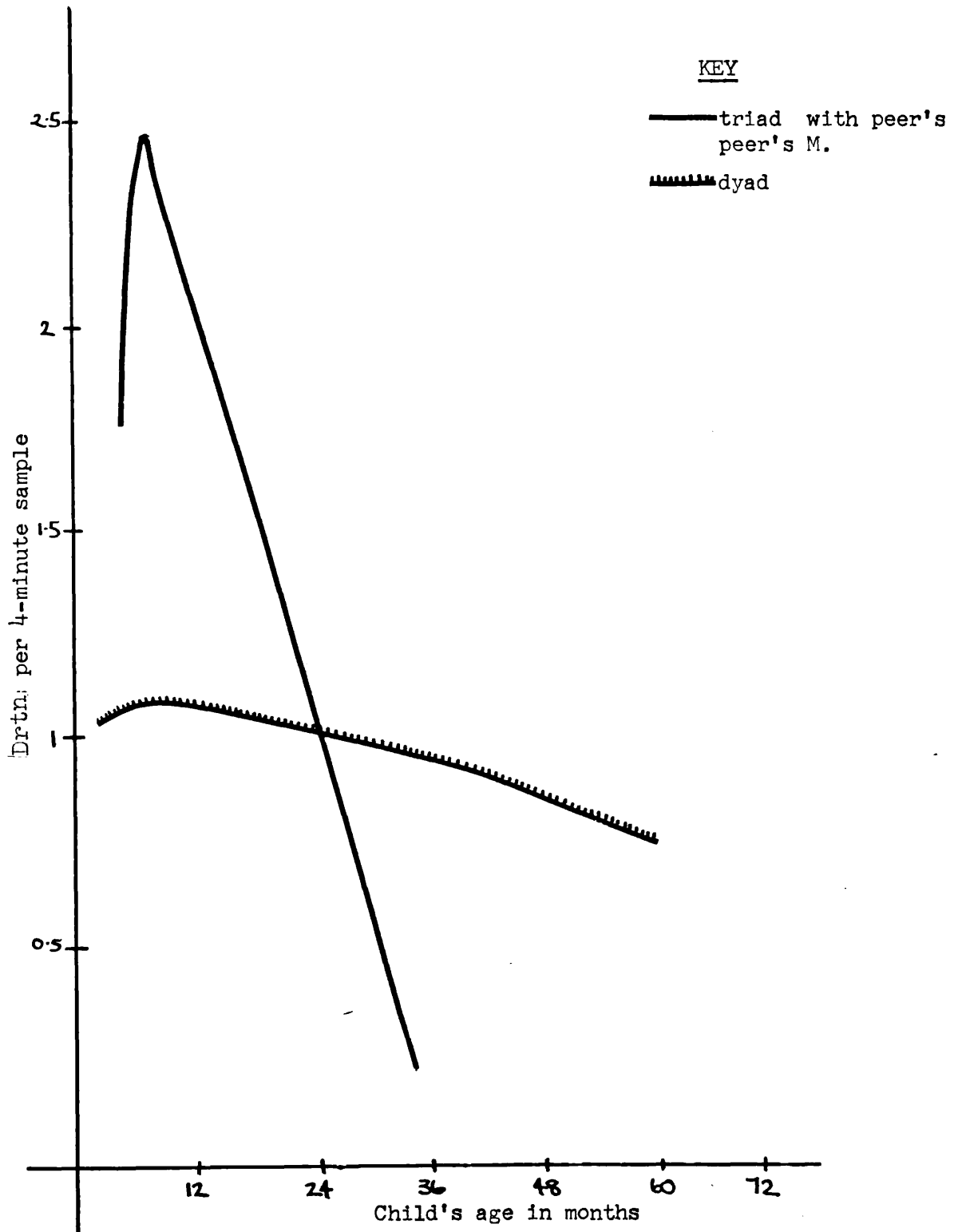


TABLE 34 : SUMMARY TABLE - DIRECTION AND MODE OF SOCIAL BEHAVIOUR

MAIN EFFECT OF CARETAKER

VOCAL TO CARETAKER - LESS VOCAL INTERACTION WITH CARETAKER IN ALL TRIADS

- LESS VOCAL INTERACTION WITH CARETAKER + OTHER IN MOTHER-FATHER TRIADS THAN IN MOTHER-CHILD DYADS.

SIGNIFICANT SIMPLE EFFECTS FOR EACH GROUP COMPOSITION

SOCIAL BEHAVIOUR	MOTHER-CHILD DYAD CONTRASTED WITH	INTERACTION TERM	DETAILS OF SIMPLE EFFECTS
TOUCHING CARETAKER	MOTHER-GRANDMOTHER-CHILD	GROUP COMP. X AGE	MORE MARKED DECREASE WITH AGE IN DYADS.
	MOTHER-FATHER-CHILD	GROUP COMP. X AGE	MORE MARKED DECREASE WITH AGE IN DYADS.
	MOTHER-PEER'S M.-CHILD	GROUP COMP. X AGE	MORE MARKED DECREASE WITH AGE IN DYADS.
VISUAL TO CT + OTHER	MOTHER-PEER'S M.-CHILD	GROUP COMP. X AGE X SEX	DECREASES WITH AGE FOR MALES IN TRIAD

D. Cooperative Interaction with Caretaker

There were no significant differences between the dyad and three triads for this category.

A. Activity

1. Main effect of group composition - none.

2. Group composition x age - none.

3. Group composition x sex - none.

4. Group composition x age x sex -

a) unoccupied - ($F(1,135) = 6.53, p < .05, R^2 = .05$). Simple interaction effects analysis failed to reveal a significant group composition x age effect for either sex. Further follow-up tests were therefore conducted on each sex separately. These revealed that males in dyads spent less time unoccupied with age, whereas males in triads show the reverse trend. Females in both dyads and triads show an increase in unoccupied behaviour, but this increase is more marked for dyads (see FIGURE 13).

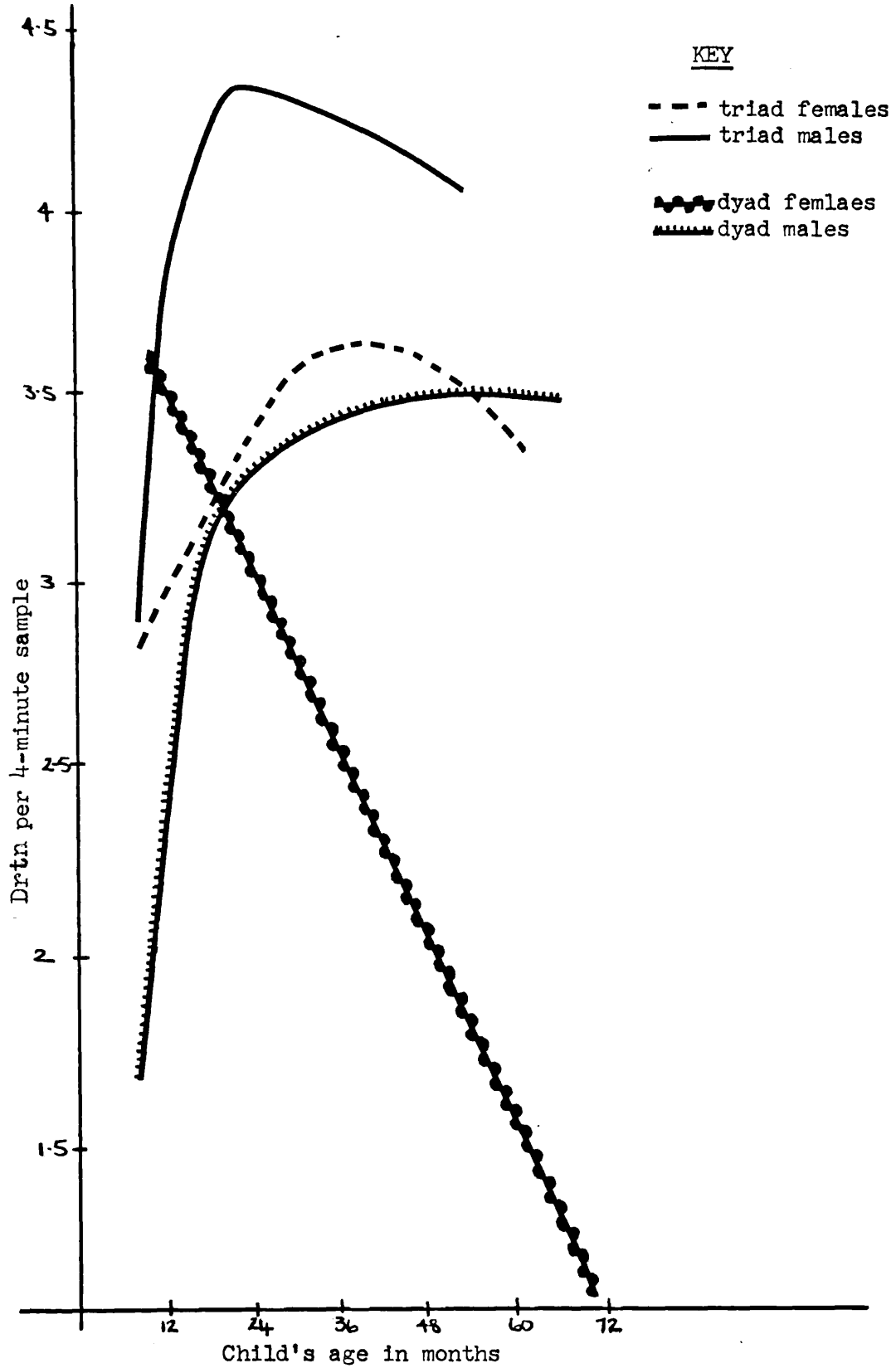
5. Group composition x number of peers - none.

6. No effect involving group composition -

a) apparatus play

b) social play

FIGURE 13 : Unoccupied behaviour according to age for males and females in dyads and triads with grandmother



B. Initiations and Breaks of Contact

1. Main effect of group composition -

a) ratio of child initiates : caretaker initiates

($F(1,135) = 7.224, p < .01, R^2 = .04$). TABLE 35 reveals that the balance between caretaker and child initiations shifts to the child in triadic settings.

TABLE 35: RATIO OF CHILD INITIATES : CARETAKER INITIATES - MEAN
Drtn PER 4-MINUTE SAMPLE

GRANDMOTHER - CHILD		GRANDMOTHER - MOTHER - CHILD	
CHILD INITIATES	ADULT INITIATES	CHILD INITIATES	ADULT INITIATES
1.09	1.14	1.28	0.87

2. Group composition x age - none.

3. Group composition x sex - none.

4. Group composition x age x sex - none.

5. Group composition x number of peers -

a) child initiates with caretaker - ($F(1,135) = 7.11, p < .01, R^2 = .05$). A significant main effects test indicated that children with 1 peer exhibited significant dyad-triad differences ($F(1,135) = 8.193, p < .01, R^2 = .10$). TABLE 36 reveals that these children initiate more interaction with caretaker in the triadic rather than the dyadic condition.

TABLE 36 : CHILD INITIATES WITH CARETAKER - MEAN Drtn PER SAMPLE
 ACCORDING TO THE NUMBER OF PEERS.

	GRANDMOTHER - CHILD	GRANDMOTHER - MOTHER CHILD
NO PEERS	1.23	0.98
1 PEER	0.94	1.57
2 PEERS	1.18	1.47

6. No effect involving group composition -

- a) caretaker initiates contact with child
- b) caretaker breaks contact with child
- c) child breaks contact with caretaker
- d) ratio of child breaks : caretaker breaks

C. Direction and Mode of Social Behaviour

1. Main effect of group composition -

a) vocal interaction with caretaker - ($F(1,135) = 6.96$, $p < .01$, $R^2 = .04$). TABLE 37 reveals that children in dyads with grandmother exhibit more vocal interaction with caretaker than do children in triads.

TABLE 37 : VOCAL INTERACTION WITH CARETAKER - MEAN RATES PER 4-MINUTE SAMPLE.

	GRANDMOTHER - CHILD	GRANDMOTHER - MOTHER CHILD
MEAN RATE	13.62	8.82

2. Group composition x age - none.

3. Group composition x sex - none.

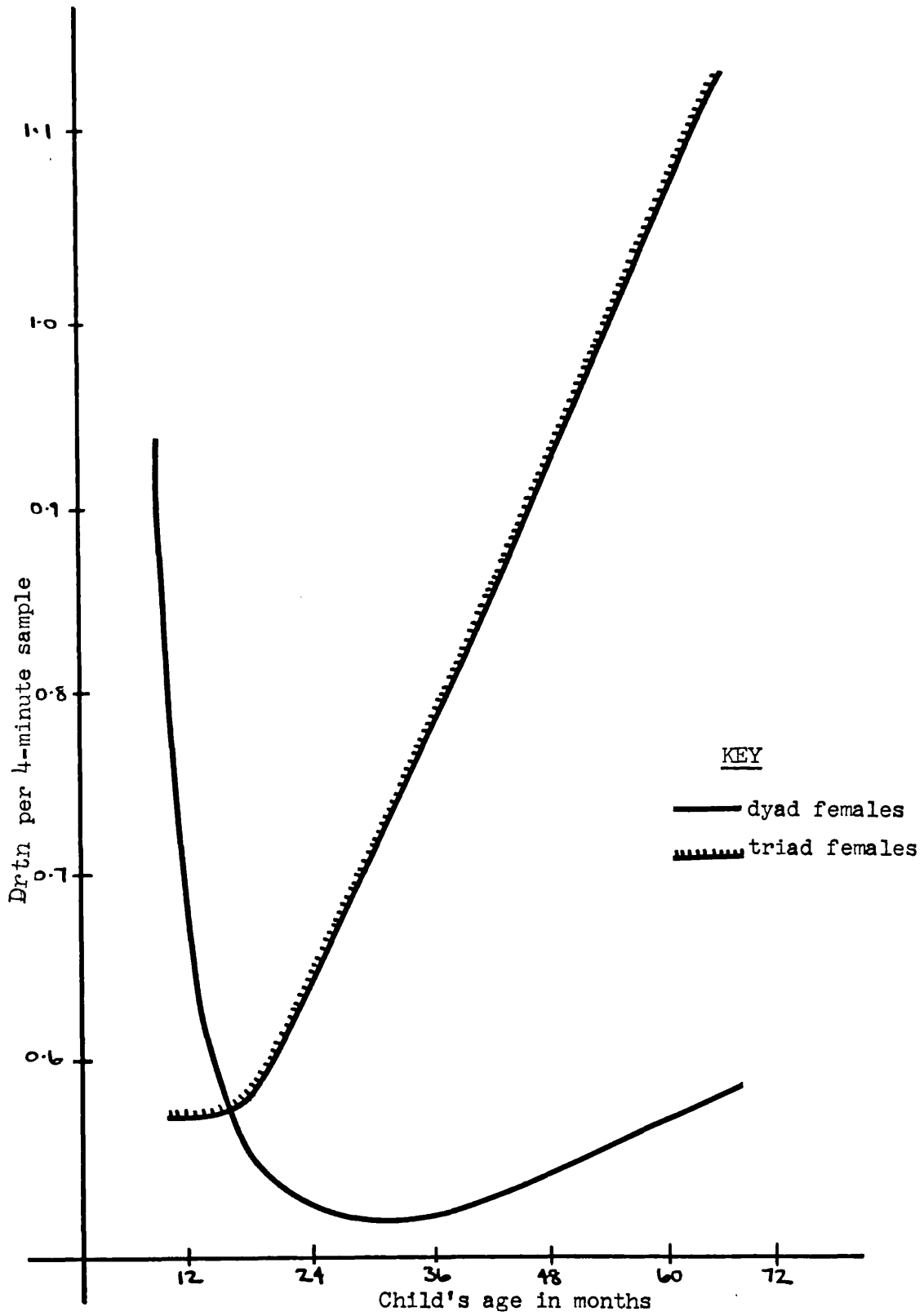
4. Group composition x age x sex -

a) visual interaction with caretaker + other - ($F(1,135) = 4.52$, $p < .05$, $R^2 = .03$). Simple interaction tests revealed a significant group composition x age effect for females only ($F(1,135) = 10.34$, $p < .01$, $R^2 = .12$). For females in dyads there was an overall decrease in this category with age; for females in triads the reverse trend was evident.(see FIGURE 14).

5. Group composition x number of peers -

a) vocal interaction with other - ($F(1,135) = 4.52$, $p < .05$,

FIGURE 14 : Visual interaction with caretaker + other according to age for females in dyads and triads with grandmother.



$R^2 = .03$). Follow-up tests in which dyad-triad comparisons were made for each peer level separately failed to show any significance. However, examination of TABLE 38 suggests that the difference is between the 'no peer'/'peers' conditions. Thus, in the 'no peers' condition children in triads exhibit more vocal interaction than do children in dyads. This trend is reversed in the 'peers' conditions.

TABLE 38 : VOCAL INTERACTION WITH OTHER - MEAN Drtn PER SAMPLE ACCORDING TO THE NUMBER OF PEERS.

	GRANDMOTHER-CHILD DYAD	GREATER OR LESSER THAN	GRANDMOTHER-MOTHER TRIAD
NO PEERS	1.63	<	2.71
1 PEER	4.89	>	4.49
2 PEERS	6.30	>	5.67

b) solitary behaviour - ($F(1,135) = 5.09, p < .05, R^2 = .04$). A significant main effects test indicated that children with no peers exhibited significant dyad-triad differences ($F(1,135) = 4.49, p < .05, R^2 = .07$). TABLE 39 reveals more solitary behaviour in the triad.

TABLE 39 : SOLITARY BEHAVIOUR - MEAN *Drtn* PER 4-MINUTE SAMPLE
 ACCORDING TO THE NUMBER OF PEERS.

	GRANDMOTHER-CHILD DYAD	GRANDMOTHER-MOTHER TRIAD
NO PEERS	8.02	11.23
1 PEER	10.12	10.81
2 PEERS	11.10	9.11

6. No effect involving group composition -

-
- a) visual interaction with caretaker
 - b) vocal interaction with caretaker + other
 - c) touching caretaker
 - d) touching caretaker + other

D. Cooperative Interaction With Caretaker

1. Main effect of group composition - none.

2. Group composition x age - none.

3. Group composition x sex - ($F(1,135) = 4.45, p < .05, R^2 = .03$).

Follow-up tests in which dyad-triad comparisons were made for each sex separately indicated the difference to be significant in males only ($F(1,135) = 6.62, p < .05, R^2 = .08$). TABLE 40 reveals that males in dyads exhibit more cooperative interaction with caretaker than males in triads.

TABLE 40 : COOPERATIVE INTERACTION WITH CARETAKER - MEAN Drtn PER 4-MINUTE SAMPLE ACCORDING TO SEX.

	GRANDMOTHER - CHILD DYAD	GRANDMOTHER - MOTHER TRIAD
MALES	10.43	5.85
FEMALES	6.16	5.24

4. Group composition x age x sex - none.

5. Group composition x number of peers - ($F(1,135) = 6.39, p < .05,$

$R^2 = .04$). Follow-up tests in which dyad-triad comparisons were made for each peer level indicated a significant difference for children with no peers ($F(1,135) = 5.49, p < .05, R^2 = .10$). TABLE 41 reveals that children with no peers exhibit more cooperative interaction with caretaker in dyads.

TABLE 41 : COOPERATIVE INTERACTION WITH CARETAKER - MEAN Drtn PER
 4-MINUTE SAMPLE ACCORDING TO NUMBER OF PEERS.

	GRANDMOTHER - CHILD	GRANDMOTHER-MOTHER CHILD
NO PEERS	12.01	6.31
1 PEER	6.22	5.01
2 PEERS	3.30	5.60

TABLE 42 : SUMMARY TABLE : GRANDMOTHER-CHILD AS A
BASELINE

MAIN EFFECT OF GROUP COMPOSITION

1. VOCAL INTERACTION WITH CARETAKER - MORE IN DYAD.
2. RATIO OF CHILD INITIATES : CARETAKER INITIATES - BALANCE SHIFTS TO CHILD IN TRIAD.

CATEGORY	INTERACTION TERM	DETAILS OF SIMPLE EFFECTS
UNOCCUPIED	GROUP COMP. X AGE X SEX	INCREASES WITH AGE FOR MALES IN TRIADS. DECREASES WITH AGE FOR MALES IN DYAD. MORE MARKED INCREASE FOR FEMALES IN DYAD.
CHILD INITIATES WITH CARETAKER	GROUP COMP. X NO. PEERS	ONE PEER ASSOCIATED WITH MORE INITIATIONS IN DYADS.
VISUAL TO CARETAKER + OTHER	GROUP COMP. X AGE X SEX	DECREASE WITH AGE FOR FEMALES IN TRIADS. INCREASE FOR FEMALES IN DYADS.
VOCAL TO OTHER	GROUP COMP. X NO. PEERS	NO PEERS ASSOCIATED WITH MORE VOCAL TO OTHER IN TRIADS
SOLITARY	GROUP COMP. X NO. PEERS	NO PEERS ASSOCIATED WITH MORE SOLITARY IN TRIADS.
COOPERATIVE WITH CARETAKER	GROUP COMP. X SEX	MORE COOPERATIVE FOR MALES IN DYADS.
	GROUP COMP. X NO. PEERS	NO PEERS ASSOCIATED WITH MORE COOPERATIVE IN DYADS.

11:3:B:ii RESULTS - FATHER-CHILD DYAD AS A BASELINE

A. Activity

1. Main effect of group composition -

a) unoccupied - ($F(1,102) = 5.61, p < .05, R^2 = .05$). TABLE 43 reveals that children in triads with father spend more time unoccupied than do children in dyads.

TABLE 43 : UNOCCUPIED BEHAVIOUR - MEAN Drtn PER 4-MINUTE SAMPLE.

FATHER - CHILD	FATHER-MOTHER CHILD
4.72	6.70

2. Group composition x age - none.

3. Group composition x sex - none.

4. Group composition x age x sex - none.

5. Group composition x number of peers - none.

6. No effect involving group composition -

a) apparatus play

b) social play

B. Initiations and Breaks of Contact

There were no significant effects involving group composition for any of the initiation/break categories.

C. Direction and Mode of Social Behaviour

1. Main effect of group composition -

a) vocal interaction with other - $F(1,102) = 7.95, p < .01, R^2 = .06$). TABLE 44 reveals that children in triads exhibit more vocal interaction with other.

b) solitary behaviour - ($F(1,102) = 5.04, p < .05, R^2 = .05$). TABLE 44 reveals that children in triads spend more time alone than do children in dyads.

TABLE 44 : CATEGORIES EXHIBITING A MAIN EFFECT OF GROUP COMPOSITION
- MEAN Drtn PER 4-MINUTE SAMPLE.

CATEGORY	FATHER - CHILD	FATHER - MOTHER CHILD
VOCAL INTERACTION WITH OTHER	2.89	4.23
SOLITARY BEHAVIOUR	7.22	10.54

6. No effects involving caretaker type -

- a) visual to caretaker
- b) visual to caretaker + other
- c) vocal to caretaker
- d) vocal to caretaker + other
- e) touching caretaker
- f) touching caretaker + other

D. Cooperative Interaction With Caretaker

There were no significant effects involving group composition for this category.

TABLE 45 : SUMMARY TABLE : FATHER-CHILD AS A BASELINE

MAIN EFFECTS OF GROUP COMPOSITION -

1. UNOCCUPIED - MORE IN TRIAD.
2. VOCAL INTERACTION WITH OTHER - MORE IN TRIAD.
3. SOLITARY - MORE IN TRIAD.

A. Activity

1. Main effect of group composition - none.

2. Group composition x age - none.

3. Group composition x sex - none.

4. Group composition x age x sex -

a) social play - ($F(1,43) = 7.82, p < .01, R^2 = .16$). Simple interaction effects analysis failed to reveal a significant group composition x age effect for either sex. FIGURE 15 reveals that this is attributable to age trends going in opposite directions for the two sexes. Thus, males in dyads show an overall decrease in social play with age, whereas the trend is reversed for males in triads; females in dyads show an increase in social play with age, whereas the trend is reversed for females in triads.

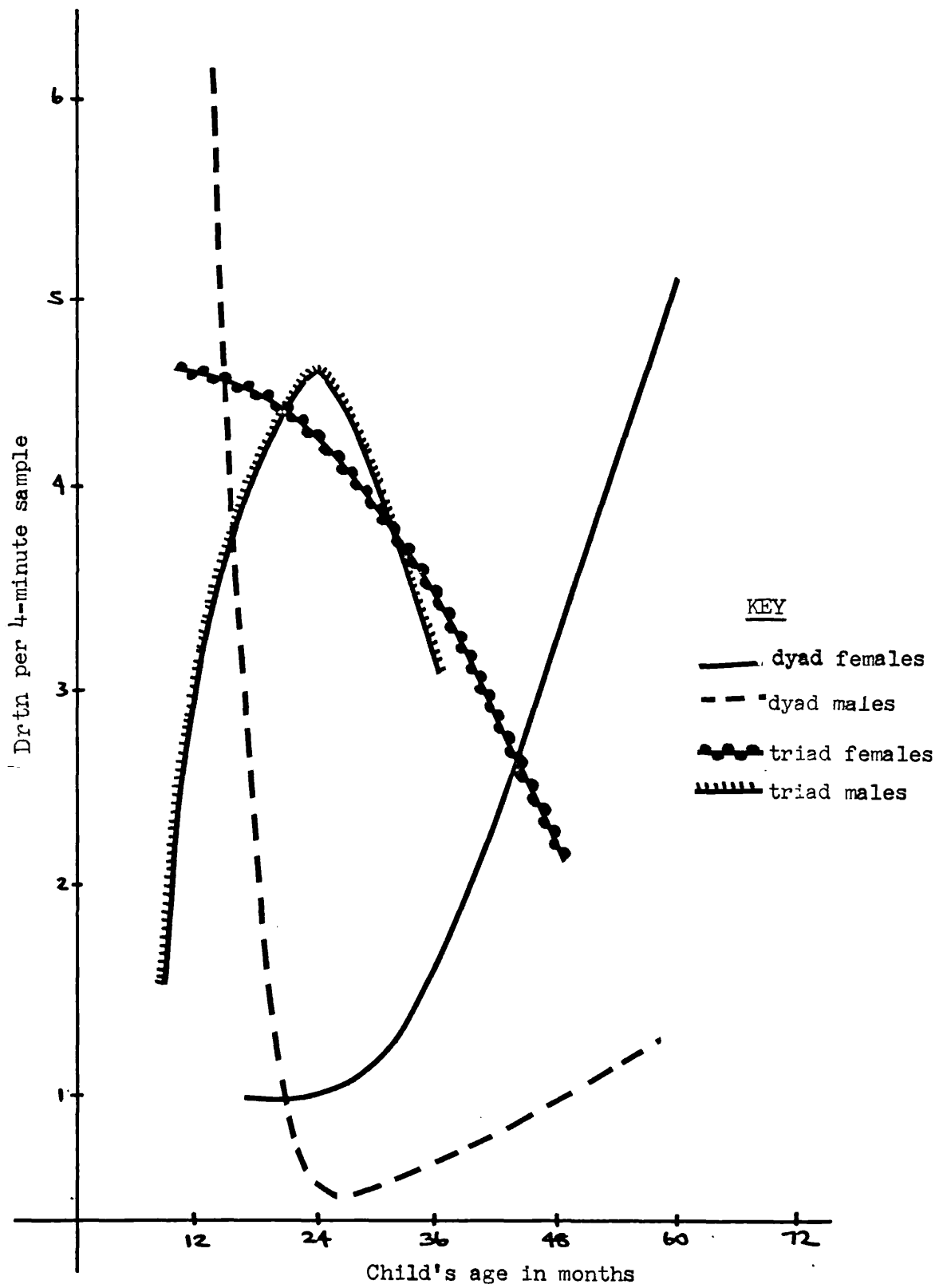
5. Group composition x number of peers - none.

6. No effect involving group composition -

a) unoccupied

b) apparatus play

FIGURE 15 : Social play for males and females in dyads and triads with peer's mother.



B. Initiations and Breaks of Contact

1. Main effect of group composition -

 a) child breaks contact with caretaker - ($F(1,43) = 4.23$,
 $p < .05$, $R^2 = .10$). TABLE 46 reveals that children break more contact
 in triads

TABLE 46 : CHILD BREAKS CONTACT WITH CARETAKER - MEAN Freq. PER
 4-MINUTE SAMPLE.

PEER'S MOTHER - CHILD	PEER'S MOTHER-MOTHER CHILD
0.59	0.84

b) ratio of child breaks : caretaker breaks - ($F(1,43) = 4.972$,
 $p < .05$, $R^2 = .08$). TABLE 47 reveals that children take more
 responsibility for breaking contact in the dyad, thus making a more
 even balance between adult breaking and child breaking contact.

TABLE 47 : RATIO OF CHILD BREAKS : CARETAKER BREAKS - MEAN Freq. PER
 4-MINUTE SAMPLE.

PEER'S MOTHER - CHILD		PEER'S MOTHER - MOTHER - CHILD	
CHILD BREAKS	ADULT BREAKS	CHILD BREAKS	ADULT BREAKS
0.84	0.73	0.59	0.76

2. Group composition x age -

 a) child initiates contact with caretaker - ($F(1,43) = 6.93$,
 $p < .01$, $R^2 = .14$). FIGURE 16 reveals that children in dyads with
 peer's mother show no age effect in their initiations of contact

with caretaker; children in triads on the other hand exhibit an overall increase in initiations with age.

3. Group composition x sex - none.

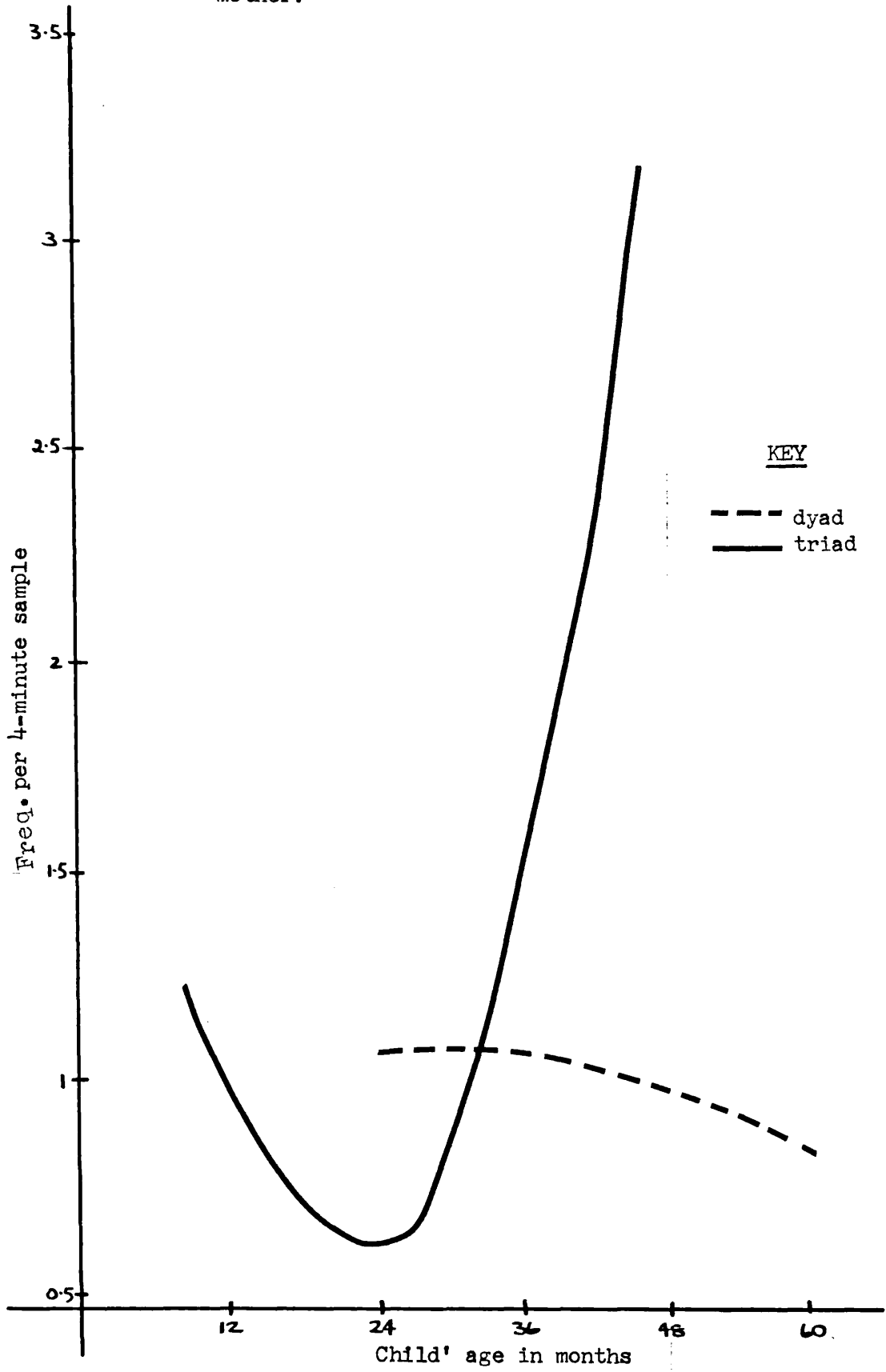
4. Group composition x age x sex - none.

5. Group composition x number of peers - none.

6. No effect involving group composition -

- a) caretaker initiates contact with child
- b) caretaker breaks contact with child
- c) ratio of child breaks : caretaker breaks

FIGURE 16 : Child initiates contact with caretaker for children in dyads and triads with peer's mother.



C. Direction and Mode of Social Behaviour

1. Main effect of group composition -

a) visual interaction with caretaker - ($F(1,43) = 5.03$, $p < .05$, $R^2 = .09$). TABLE 48 reveals that children in peer's mother-mother triads exhibit more visual interaction with caretaker than do children in dyads.

TABLE 48 : VISUAL INTERACTION WITH CARETAKER - MEAN Drtn PER 4-MINUTE SAMPLE.

PEER'S MOTHER-CHILD	PEER'S MOTHER-MOTHER-CHILD
0.65	1.51

2. Group composition x age -

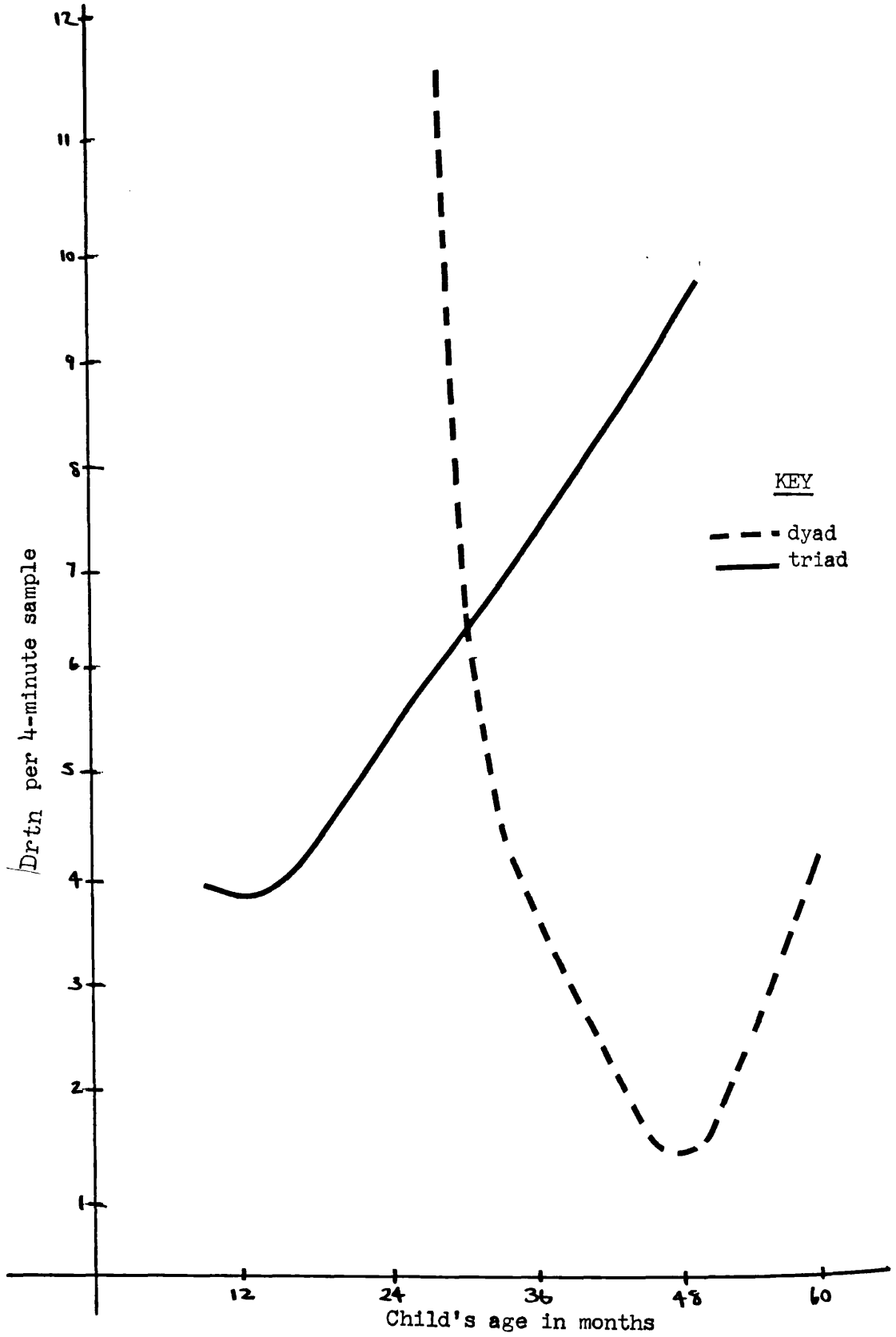
a) vocal interaction with caretaker - ($F(1,43) = 7.658$, $p < .01$, $R^2 = .14$). FIGURE 17 reveals that children in dyads show an overall decrease in vocal interaction with age, whereas the reverse occurs for children in triads.

3. Group composition x sex - none.

4. Group composition x age x sex - none.

5. Group composition x number of peer's - none.

FIGURE 17 : Vocal interaction with caretaker for children in dyads and triads with peer's mother.



6. No effect involving group composition -

-
- a) visual to caretaker + other
 - b) vocal to caretaker + other
 - c) vocal to other
 - d) touching caretaker
 - e) touching caretaker + other
 - f) solitary behaviour

D. Cooperative Interaction With Caretaker

There were no significant effects involving group composition for this category.

TABLE 49 : SUMMARY TABLE : PEER'S MOTHER AS A BASELINE

SIGNIFICANT MAIN EFFECTS :

1. CHILD BREAKS CONTACT WITH CARETAKER - MORE IN TRIAD.

2. RATIO OF CHILD BREAKS:ADULT BREAKS - CHILDREN BREAK MORE RELATIVE TO CARETAKER BREAKS IN DYAD.

3. VISUAL INTERACTION WITH CARETAKER - MORE IN TRIADS.

SIGNIFICANT SIMPLE EFFECTS

CATEGORY	INTERACTION TERM	DETAILS OF SIMPLE EFFECTS
SOCIAL PLAY	GROUP COMP. X AGE X SEX	DECREASES WITH AGE FOR MALES IN DYADS INCREASES WITH AGE FOR MALES IN TRIADS INCREASES WITH AGE FOR FEMALES IN DYADS DECREASES WITH AGE FOR FEMALES IN TRIADS.
CHILD INITIATES WITH CARETAKER	GROUP COMP. X AGE	INCREASES WITH AGE IN TRIADS.
VOCAL INT. WITH CARETAKER	GROUP COMP. X AGE	INCREASES WITH AGE IN TRIADS. DECREASES WITH AGE IN DYADS.

Format of discussion

The aim of this chapter is to draw together some of the more important points that arise from the detailed and rather specific treatment of results presented in the last chapter.

Two reasons can be given for pitching the discussion at this general level. First there has been relatively little research into differences between children's behaviour in adult-child dyads and adult-adult-child triads. The study of second order effects comprises the only facet of this area which has been systematically researched. As mentioned in CHAPTER 3 these studies are a fairly recent innovation, and as Belsky (1981) points out, concentrate on children 30 months old and less. These studies also have a different emphasis, focussing mainly on the effect of fathers on mother-infant interaction (ie. second order effects), rather than the broader differences between dyadic and triadic interaction. Thus there is little related work against which to set the specific results of the present study.

Second it should be born in mind that the present study is quite rare in being a naturalistic study in which caretakers other than the mother are used as baselines for dyad-triad comparisons. Clarke-Stewart (1978), in her study of second-order effects, writes specifically of the importance of using other caretakers (especially fathers) as baselines, but considers it a difficult task in view of

the limited accessibility observers in the home have to dyadic interaction between children and non-mothers. What is important at such a preliminary stage then is not speculation about the minutiae of simple effects but a global consideration of broader trends.

Whilst all this may appear to make the detailed 4-way analyses of variance used in the CHAPTER 11 excessive, it is not deemed so. A consideration of global trends need not necessitate simplistic analyses. From the point of view of guiding further research into this topic it would seem best to be as detailed as possible as regards the nature of broad-based differences between dyads and triads. In this way a clearer focus can be given to more detailed studies later.

Therefore, the discussion below will contain a preliminary section in which relevant findings are broadly related to recent research into second order effects. Thereafter, discussion will be devoted to the significance of results taken as a whole.

1. How the findings relate to research into second-order effects

A. Amount of parent-child interaction in dyadic and triadic settings

As with past work into second-order effects, the results are suggestive of differences between a child's experience when with mother only as opposed to when with both parents. However, the differences are not the same as those reported in other studies. Belsky (1979) found an overall stability in the total amount of

parent-child interaction across dyadic and triadic settings; Lamb (1976;1977b) and Clarke-Stewart (1978) report an increase. The current study found a reduction : children with both parents experience less vocal interaction with caretakers (see TABLE 32), less vocal interaction with caretakers + others (see TABLE 33), and less tactile contact with caretakers especially when young (see FIGURE 13). The overall picture is one of less contact between parent and child when both parents are present.

Although this may seem a serious disagreement, the difference probably stems from the fact that social interaction has been coded differently. Previous studies of second order effects have usually divided mother-father-child interactions into component parts (eg. mother initiates conversation with child, then child laughs at mother, then father picks child up), Each of these is then coded separately at 10-second (Clarke-Stewart 1978) or 15-second (Belsky 1977;Lamb 1977b) intervals . If all three partners are interacting together during the course of one interval, then there is a strong possibility that two or more scores will be given in that interval . Thus the sequence described in the example above would be scored once for mother interacting with child, once for father interacting with child, and once for child interacting with mother. If only mother and child are together though, the likelihood of two or more scores being given in one interval is considerably reduced since there are fewer contributors to interaction. There is then a differential weighting given to interaction in dyadic and triadic settings, with higher scores being more likely in the latter.

In the present study, however, dyadic and triadic interactions were given equal weightings. Since interaction was seen in terms of how much of it the focal child experienced, whether the interaction was with one parent or both simultaneously had no effect on the coding : there was caretaker-child interaction. Some additional analyses revealed that approximately 30% of children's interactions in triads involved both caretakers simultaneously. Had these been weighted in a similar way to the weightings given in previous studies, then it is likely that the results would have been more consistent with past work.

However the picture created by the present study is illuminating. Talking in terms of sheer quantity there seems to be a reduction in the amount of interaction children have with parents when both are present. This is probably caused by the parents interacting amongst themselves for some of the time (Rosenblatt and Cleaves 1981; Belsky 1981). Nevertheless, the additional presence of father provides the facility for more complex and skilful 3-way interactions. Thus whilst there may be an overall decrease in total time spent interacting with parents, the disadvantages of this may be outweighed by the opportunity for more varied and complex social experience. The greater variety of interaction offered in triads has been mentioned in previous studies of second-order effects. Clarke-Stewart (1978) for example reports that fathers and mothers offer different sources of stimulation to children . However, what is being suggested on the basis of present results is that triads may not just offer the child a choice of two-way interactions, but also an opportunity for engaging in simultaneous interaction with both

parents. Looked at holistically the picture of triadic interaction is one of less interaction requiring more skill, meshing and social awareness; looked at atomistically the picture is one of equal or greater interaction , with more variety in one-to-one contacts. Which view is more useful will await further research.

That fundamental differences can result from interpreting social interaction in terms of a focal individual's experience (in this case the child's), rather than in terms of each partner's contribution to interaction , is clearly shown by Altmann (1980) in her study of baboon mothers and infants. By way of an example she mentions non-mothers investigating young infants while they are being cradled by their mothers. From the non-mothers point of view this can be seen as "interest" and "investigation"; from the mother's point of view though it is more appropriately described as aggressive or threatening behaviour. Although this example may seem far removed from the present study, it's relevance lies in making the point that a slight change in the researcher's emphasis can radically alter the interpretation given to social behaviour. Contrasting previous studies of second-order effects with the present one makes the same point. Encouragingly, Altmann too prefers the method which concentrates on one focus (in her case the mother-infant unit), and describes interaction in terms of the focal experience.

A factor which may have contributed marginally to this inconsistency between the findings of past and present work, is observer effect. Both Belsky (1979) and Lamb (1977b) mention the possibility that

their results were affected by this. With an observer present who is most obviously concerned with the child's social world, a second parent might be more easily drawn into interaction with the child, even when the other parent is already involved. Under free-range conditions, the awareness that father is playing with child may prompt many mothers to use the time for household chores or hobbies. However, this might be thought inappropriate during periods of intensive parent-child observation. In the playground, by contrast, many mothers took the opportunity of having father there to find a shady tree outside the playground, where they would lie reading, or sit at the edge of the playground knitting.

B. Mothers' versus fathers' influence

Some researchers have hypothesised that father's influence on children is an indirect one, being filtered through the mother (Clarke-Stewart 1978; Lewis and Weinraub 1976; Schaefer 1976; Parke 1978).

The most direct means of testing this lies in comparing mother-child, father-child, and mother-father-child interactions. The present study allows for this comparison. If the hypothesis is correct, one would expect that "adding" mother to father-child pairs would produce more differences than "adding" father to mother-child pairs.

The effect of "adding" mother to father-child pairs was significant for 3 categories and in all cases the dyad/triad differences were

main effects (ie. unaffected by interaction with age, sex or number of peers). Thus children spent more time unoccupied, more time alone and were involved in more vocal interaction with others when in triads (see TABLE 45).

The effect of adding father to mother-child pairs was significant for 6 categories, only two of which were main effects. There was less vocal interaction with caretakers in triads; less vocal interaction with caretakers + others in triads; apparatus play decreased with age more markedly for males in triads (see TABLE 28); unoccupied behaviour decreased with age in dyads but increased with age in triads (see TABLE 28); caretakers in triads initiated more contacts when peers were present (see TABLE 31); tactile contact with caretaker showed a more marked decrease with age in dyads (see TABLE 34).

What emerges then is that the effect of adding mother to father-child pairs is a much less complex affair than adding father to mother-child pairs. In the former, there will be fewer differences between the dyad and triad, and these differences are more likely to depend on intervening variables like the child's age and sex. In the latter there will be more effects and they are more robust.

With reference to the hypothesis about fathers having an indirect effect on children then, there seems to be no evidence for this. What seems to happen is that father's influence is fairly predominant and also more dependent on the child's age and sex than is mother's influence.

Certainly it is evident that one cannot equate the effect of adding father to mother-child dyads with the effect of adding mother to father-child dyads. This is an important point since it suggests that the child's relationships with mother and father are considerably different. This point will be pursued in more detail in the next section.

2. Results taken as a whole

The crux of the argument presented here rests on differences between "adding" mother to various caretaker-child pairs, and "adding" various caretakers to the mother-child pair. For easy reference, a simple diagram representing the significant results contained in CHAPTER 11 is presented on the next page (see FIGURE 18).

What happens if a mother is added to various caretaker-child pairs? The results suggest that this depends very much on the identity of the original caretaker. Adding mother to grandmother results in several differences across all areas of behaviour. As regards Activity, time spent unoccupied is affected. As regards Initiations and Breaks, the ratio of child initiates:adult initiates changes. As regards Direction and Mode, vocal interaction between child and caretaker, vocal interaction between child and caretaker + other, and solitary behaviour are all affected by the mothers presence or

FIGURE 13 : QUICK REFERENCE DIAGRAM OF SIGNIFICANT RESULTS CONTAINED IN CHAPTER 11.

DYAD	MOTHER-CHILD	MOTHER-CHILD	MOTHER-CHILD	GRANDMOTHER-CHILD	FATHER-CHILD	PEER'S M.-CHILD
CT ADDED	GRANDMOTHER	FATHER	PEER'S M.	MOTHER	MOTHER	MOTHER
ACTIVITY	unoccupied apparatus	unoccupied apparatus	unoccupied	unoccupied	unoccupied	social play
INITIATIVE/ EFFECT	-	caretaker initiates	child breaks	ratio of initiations	-	child initiates child breaks ratio of breaks
SOCIAL	vocal with caretaker tactile with caretaker	vocal with caretaker tactile with caretaker	vocal with caretaker tactile with caretaker	vocal with caretaker visual with CT + other	vocal with other solitary	vocal with caretaker visual with caretaker
		vocal with CT + other	visual with CT + other	vocal with other solitary cooperative		

absence. The amount of time spent in cooperative interaction with caretaker is affected too . (See TABLE 42).

Adding mother to peer's mother-child pairs is associated primarily with differences in Initiations and Breaks of Contact : child initiates with caretaker, child breaks with caretaker, and the ratio of child breaks:adult breaks are all affected (see TABLE 49).

Adding mother to father-child pairs produces comparatively few effects in any one aspect of behaviour : time spent unoccupied, solitary, and in vocal interaction with others are affected (see TABLE 45).

Thus adding mother to grandmother-child pairs has a fairly widespread effect on several aspects of behaviour; adding mother to peer's mother-child pairs has a fairly localised effect on initiations and breaks of contact; adding mother to father-child pairs makes comparatively little difference.

Looking now at the other side of this : what happens when different caretakers are added to the mother-child pair? Is the effect also dependent on the identity of the additional caretaker ?

Whether it is grandmother, father or peer's mother, the same dyad/triad differences will emerge for vocal and tactile interaction with caretaker ie. the two most commonly observed categories of social interaction (see TABLE 34). There are other differences which are unique to each of the dyad/triad comparisons, but

considering the predominance of vocal and tactile interaction between caretaker and child, the overall effects on children's experience are very similar regardless of the additional caretaker's identity.

For children with mothers then, the addition of a second caretaker affects their experience in much the same way regardless of who is added. For children with other caretakers, the effect of adding mother depends quite extensively on the identity of that other caretaker.

What does this imply? Taking the null hypothesis, it is predicted that caretakers will have the same effect on children regardless of caretaker identity. In this case there would be no difference between adding a non-mother to a mother-child pair and adding a mother to a non-mother-child pair. Thus :

if B = C
then A + C versus A + B + C
equals A + B versus A + B + C

Since the data fail to support this null hypothesis, the conclusion is that $A \neq B$ ie. that mothers and other caretakers have different effects on the child's social experience. The data thus provide evidence to supplement the results of CHAPTER 9 : different caretakers affect children in different ways.

What form do these difference take? The findings presented here suggest that some caretakers may buffer the effects of a second caretaker more than others. Children with fathers seem most buffered

against the effects of mother being included, since there are very few differences between father-child and father-mother-child interaction. This finding relates very well to Clarke-Stewart's hypothesis about second-order effects : as mothers spend all day with their children, the effect of father's presence will be fairly disruptive to mother-child interaction since he is present quite rarely. Fathers however are rarely alone with the child, so the effect of mother's presence will be less disruptive to father-child interaction. Fathers, then , develop a style of interaction with children which derives largely from triadic settings, thus reducing the amount of dyad/triad differences. The present data support this hypothesis in finding that father-child versus father-mother-child interactions are more similar than mother-child versus father-mother-child interactions.

How does this finding relate to investigations of paternal predictors of development and the contribution fathers make to the child's social world (eg. Epstein and Radin 1975)? Clarke-Stewart (1978) and Belsky (1981) have criticised such studies for their exclusive concentration on fathers, rather than on fathers within a triadic family system. Although the findings in the present study are tentative, they do suggest that this may be less serious than they anticipated since father's influence was relatively stable across mother-present/mother-absent conditions.

Mothers also show evidence of buffering children from the influence of a second caretaker, although the exact nature of this buffering effect is markedly different. There are three triads in which mother

is present. In all three, children's behaviour differs in the same way from that observed in the mother-child dyad. It has already been established that different caretakers have different effects on children. Therefore adding a grandmother should not have the same effect as adding a father. That the effects have been found to be the same suggests that the mother's presence changes the unique contributions these caretakers make to children's experience into a more uniform contribution. Thus she filters out the effects of specific caretaker identity. In this way it is group size rather than caretaker identity which becomes the important factor in determining dyad/triad differences for children with mother.

How are these buffering effects brought about? Clarke-Stewart (1978) suggests that mothers take a backseat during play with children when fathers are present, allowing father more opportunity to play. If this were so one would expect mother-child/mother-father-child differences to be greater than father-child/mother-father-child differences. This was found in the present study, although it would have been interesting to see whether fathers interacted more with children in triads than did mothers in order to confirm Clarke-Stewart's hypothesis more fully.

Does mother also take a backseat with other caretakers? Certainly this does not appear to be the case when one compares grandmother-child with mother-grandmother-child interaction. Here there are numerous and widespread differences. In fact it seems more likely that mothers swamp the influence of grandmother thus creating large dyad/triad differences for children with grandmothers.

It is interesting to note that adding mother to peer's mother-child pairs has about as much effect on the child's experience as adding peer's mother to mother-child pairs, although not in the same categories. As was mentioned in CHAPTER 8, peer's mothers rarely accompany children as a single caretaker - in only 37% of samples. As such one might expect more differences between peer's mother versus peer's mother-mother-child groupings, than between mother-child versus peer's mother-mother-child groupings. That these were not found suggests that young mothers have a similar influence on children regardless of whether the children are their own or not, as was also suggested in CHAPTER 10.

If one could think of there being a hierarchy among caretakers as regards their influence on children, it would appear that fathers have the greatest influence, mothers next greatest, peer's mother less and grandmothers least. This hypothesis is worth bearing in mind when considering the possibility that grandmothers are in more extended daily contact with children than fathers, as was discussed in CHAPTER 8. It is possible that duration of contact needs to be balanced against the salience of influence in order that accurate evaluations be made of different caretakers' contributions to the child's social experience.

If, in further research, such a hierarchy was found to exist it would have important implications for research into parental influence on children's development. Studies have long focussed on maternal influence, first because mothers spend most time with children, second because fathers are rarely alone with children and

so may have little direct effect on their development. However, if as the study here suggests his influence is both direct and dominant, then it would become important to attach greater significance to his role in the child's development. However, many studies report fathers as being more like playmates to their children, while mothers are more like caregivers (Lamb 1977c; Belsky 1979; Parke 1978; Clarke-Stewart 1978). Thus the findings reported here may be very situation-specific. In a non-play setting, mother's influence might well be very much stronger.

However, if father is dominant in his effect one would expect greater differences between mother-child/mother-father-child comparisons than between mother-child/mother-grandmother-child or mother-child/mother-peer's mother-child comparisons. Yet these three showed the same pattern of dyad/triad effects. Whilst this is not thought to negate the notion of a hierarchy of influence, it is an indication that there are many more mechanisms determining dyad/triad differences than buffering and hierarchies, and doubtless these other mechanisms sometimes take prominence.

There is considerable room for speculation as to whether fathers' apparently predominant effect derives from cultural differences between maternal and paternal roles in Western society. This point merits detailed consideration in further comparative research in which, for example, playgrounds are compared with other communal (and preferably child-centred) venues in non-Western cultures. However, it must be noted that the caretaker-child groups used in the present study were drawn from several different cultural and

socioeconomic groups (eg. families living in traditional Zulu, Hindu, Muslim, and Christian homes). Tentatively, this might suggest a widespread predominance of influence across different cultural groups.

What is evident from this analysis is that the effect of caretakers on children's behaviour is (predictably) no simple matter, especially when there is more than one caretaker type present at the same time. Caretaker effects are thus dynamic, being influenced by factors like the caretaker's own identity (and thus their relationship with the child); the presence or absence of other caretakers and their relationship with the child; which of the two caretakers is used as a baseline for making dyad/triad comparisons; child's age and sex; number of peers; the aspect of behaviour focussed on , and so on.

In this chapter, the terms triad and dyad have been used as a convenient shorthand. As was mentioned earlier peers (or more accurately siblings and/or peers) were often present too. If the effect of peer presence was equally important in influencing children's behaviour, then two findings would have been expected from the study:

a) In CHAPTER 7 : several main effects of the number of peers variable (see TABLES 7 to 11).

b) In the present chapter, several dyad/triad differences being affected by the number of peers (ie. group composition x number of peers interactions).

There are some of these, but not as many as would be expected if peer presence were as salient as caretaker presence. This lends some

support to Lamb's (1978) hypothesis that the child's relations with parents and siblings are part of different social sub-systems. It also broadens the implications of his hypothesis, extending it to caretakers who are not parents, and children who are not always the focal child's siblings. In this sense it may be that adults and children are part of different social subsystems, not simply parents and siblings. This suggestion is borne out by a recent study of second order effects in which the effects of a familiar adult's presence on mother-child interaction were different from the effects of a familiar peer's presence (Rubinstein et al 1982).

If this suggestion proves valid, then it would reflect more the systems of social interaction which have been used to describe non-human primate groups, in which relationships are more often described in terms of age classes rather than kinship classes (with the obvious exception of the infant's relationship with his mother during the phase of early dependency). This does not imply that all individuals within one age class have the same relationship with a focal individual. Neither the wealth of non-human primate studies in which focal animals have been discerned, nor the present study would imply this, only that some meaningful divisions can be made at a macro-analytic level in relationships between individuals of different age classes.

Some conclusions and suggestions for further work

This section has provided few satisfactory conclusions. One way of

achieving more conclusive results would be to gather data on all possible dyad-triad groupings containing mother, father, grandmother and peer's mother, so as to give a more complete picture. Such data would be difficult to collect naturalistically, and also formidable to analyse. What might be more suitable would be to confine comparison to mother-child, father-child, mother-father-child groupings, analysing these in more depth. In particular it seems important to assess how much of the child's behaviour is guided by mother, by father, or self-initiated ie. who determines the course of behaviour and interaction? Also a more detailed breakdown of how much interaction in triads is between mother and child, father and child, and mother, father, and child, which would allow one to see whether the parent having most influence was also the parent interacting most with the child. While this seems the most logical starting point for further work, it must be remembered that the inclusion of other caretakers (even from the cursory analysis contained here) offers more chance for perceiving the enormous complexity and richness of the child's social world. The ultimate goal then - having first streamlined techniques and categories using mothers, fathers and children - would be to expand into more ambitious comparative models.

It is certainly true that generalisations from caretaker-child dyadic interaction to more complex groups is of doubtful validity, and that reliance on adult-child dyads will (as Bronfenbrenner (1974) suggested) result in an incomplete understanding of adult-child interaction. Nor does it appear that simple 'rules' can be drawn up as to how dyads and triads will differ, since so much

depends on the individuals within the groups and their relationships with one another. Nor can it be said that any one caretaker-child relationship stands out as unique, since they all show evidence of being dynamic as regards dyad/triad differences ie. the identity of caretaker and "added" caretaker are both important in determining what dyad/triad differences will emerge. There is, therefore, little evidence of any one caretaker having a unique or robust effect.

What is clearest of all from the results is that the studies of second order effects which form the basis of adult-adult-child research at present are quite inadequate. There is very much more to be said about what it means for a child to interact with two adults than mere statements about how father affects the amount of interaction between mother and child. The present study may have made little progress in providing concrete data, but it has hopefully contributed to opening the area up for more complex and comprehensive comparisons.

CHAPTER 13 : SOME OVERALL CONCLUSIONS AND SUGGESTIONS FOR FUTURE
RESEARCH

The effect different caretakers have on children's activity and social behaviour can be both dynamic and complex. If one confines discussion to caretaker-child dyads then some simple statements can be made . For example, mothers and fathers seem best able to compensate for age and sex differences in children's abilities; nannies may be characterised by a laissez-faire style of caretaking, etc.

However, adding a second caretaker changes the picture rather a lot. No generalisable statements can be made about how triads will differ from caretaker-child pairs, since much depends on who is "added" and which caretaker type they are added to. Thus the effect of a caretaker in triads cannot be predicted from a knowledge of their effect in a dyadic setting.

Thus, in describing different caretaker-child relationships, the present study points to the importance of extending the focus beyond simple dyadic comparisons. If a choice had to be made, it could be said that dyad/triad comparisons gave more insight into the nature of different "dyadic" relationships than the more direct comparison of one dyad with another.

As regards the value of describing adult-child relationships in terms of traditional distinctions between mother- , father- ,

grandmother- etc., these were found to have some predicitive power as regards children's behaviour. However it is important to note that these distinctions rarely accounted for more than 10% of the variance in behaviour. Although they were of value, there are likely to be better ways of grouping together adult-child relationships, in which traditional role is only one of several salient variables. Whilst much work needs to be done in this area, it is hypothesised that the following variables may be found important too : adult's degree of child-centredness (measurable , for example, in terms of how often the child is permitted to determine the course of joint activity); adult's responsiveness to the child's requests (measurable , for example, in terms of whether the response draws the child into further interaction or simply answers the immediate request); the content of child initiations to adult (eg. asking for help, inviting play, inviting conversation) ;the affective content of adult-child interaction (eg. how much interaction is accompanied by smiling, laughing, cuddling, crying, teasing, commmands etc.). It is regrettable that few of these measures could be used in an outdoor venue like a playground. However, quieter indoor venues like children's libraries might prove viable.

As with most pilot studies, more questions have been raised than answered. Nevertheless the overall picture is reasonably clear : role distinctions are useful in differentiating adult-child relationships, although there influence is sensitive to changes in group structure. There are two aspects of the study which can be considered particularly important for further research : the first involving further attempts to discover key adult variables that

influence children's behaviour, and how these interact with caretaker role; the second in which changes in group structure are explored more fully for their potential in distinguishing different adult-child relationships.

CHAPTER 14 : BIBLIOGRAPHY

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APPENDIX 1 : SPECIMEN DATA CHECKSHEETS (see following pages)

To assess the frequency with which children spend long bouts of time unoccupied in between changes from one piece of apparatus to another, the columns marked "ap " are relevant. Here unoccupied is represented by 'N' and apparatus or social play by all other symbols.

APPENDIX 1 : SPECIMEN DATA CHECKSHEETS (see following pages)

To assess the frequency with which children spend long bouts of time unoccupied in between changes from one piece of apparatus to another, the columns marked "ap" are relevant. Here unoccupied is represented by 'N' and apparatus or social play by all other symbols.

NUMBER : A420 AGE : 4 YRS + ✓ CT : m

DATE : 20-3-80 60 SEX : m CTAGE : 26

AGE : 12.15 RACE : W xlequars (99)

BACKGROUND : m SES : m

3-74 CHPG 1 0 FSIZE 0 ♀SIB 2 YRS+ ♂SIB ♀PEER ♂PEER

0 0

INITIATES:							CT BREAKS:					
SUBJECT	CT	SIB	FC	UC	FA	UA	SUBJECT	CT	SIB	FC	UC	F
ARTS	✓	✓					BREAKS					

V	T	ACTIVE S.					PASSIVE S.					A P	UNCERTAIN			MISC.			ORIENT			CT. BEH.					
		D	FC	UC	FA	UA	D	FC	UC	FA	UA		D	SC	CM	HD	A	T	CO	CM	F	B	S	AD	AS	AD	PD
	✓		✓	✓							S								✓			✓	✓				
	✓		✓	✓														✓			✓	✓					
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NUMBER : 4717 AGE : 1YRST 7 ✓ CT : 4m + m

DATE : 20-3-80 60 SEX : F CTAGE : ? + ?

AGE : 9.15 - 12.15 RACE : W Not regular. (99)

BACKGROUND : m SES : m

DMMS in PG
MIN in PAKU

S	1-5	CHPG	1	F	SIZE	0	♀	SIB	♂	SIB	2YRST+	♀	PEER	♂	PEER
		2			2						1				

INITIATES: v(m)							SIB NITS = 2					CT BREAKS:				
EFFECT	CT	SIB	FC	UC	FA	UA						SUBJECT				
TITLES	v(B)											BREAKS				
	v(B)											v(B) ✓				

VISUAL		V	T	ACTIVE S.				PASSIVE S.				A	P	UNCERTAIN				MISC.				ORIENT			CT. BEH.							
SL	Q2	Q	D	FC	UC	FA	UA	D	FC	UC	FA	UA			DS	SC	CM	HD	A	T	CO	CM	F	B	S	AD	PS	AS	F	AO	FD	AL
		✓		v(B)									N	N2									v(B)					B		✓		
													N2										v(B)					B		✓		
													N2										v(B)					B		✓		
													N2										v(B)					B		✓		
													N	N2									v(B)					B		✓		
													N	LI									v(B)					B		✓		
													N	LI									v(B)					B		✓		
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		✓											N	LI									v(B)					B		✓		
		✓											N	LI									v(B)					B		✓		
		✓											N	LI									v(B)					B		✓		

amongst themselves * sibling.

APPENDIX 2A : VALUES OF R^2 FOR ALL INDEPENDENT VARIABLES AND THEIR INTERACTIONS AS USED IN THE REGRESSION ANALYSES OF CHAPTER 7.

	TOTAL R^2	AGE	SEX	AGE X SEX	CT.	CT X AGE	CT. X SEX	CT. X AGE X SEX	PEERS	CT. X PEERS
ACTIVITY										
APPARATUS	.062	.001	.001	.001	.017	.012	.024	.003	.001	.004
SOCIAL	.091	.003	.001	.008	.013	.010	.027	.019	.001	.010
UNOCCUPIED	.099	.009	.002	.002	.019	.013	.009	.041	.001	.002
INITIATION/ BREAK										
CT. INIT. TO CHILD	.070	.009	.006	.001	.005	.011	.002	.006	.005	.005
CT. BREAK WITH CHILD	.036	.001	.002	.001	.005	.011	.002	.006	.005	.005
CHILD INIT. TO CT.	.123	.055	.001	.001	.014	.013	.004	.005	.009	.025
CHILD BREAK WITH CT.	.040	.001	.001	.001	.009	.001	.015	.001	.006	.007
INTERACTION CATEGORIES										
VISUAL TO CT.	.008	.007	.006	.003	.028	.004	.014	.010	.006	.001
VISUAL TO CT. + OTHER	.069	.004	.001	.001	.003	.006	.010	.002	.006	.016
VOCAL TO CT.	.151	.022	.002	.002	.004	.007	.043	.006	.015	.019
VOCAL TO CT. + OTHER	.083	.001	.001	.003	.022	.003	.006	.040	.005	.004
VOCAL TO CT. + OTHER	.068	.032	.001	.002	.003	.005	.001	.001	.016	.005
TOUCHING CT.	.235	.172	.001	.001	.007	.015	.018	.004	.002	.017
TOUCHING CT. + OTHER	.049	.005	.001	.001	.021	.005	.010	.007	.011	.006
SOLITARY	.086	.005	.001	.002	.033	.011	.011	.005	.004	.015
COOPERATIVE WITH CT.	.149	.038	.001	.002	.037	.009	.023	.011	.008	.019

APPENDIX 2B: DETAILS OF SIGNIFICANT F-RATIOS REPORTED IN CHAPTER 7

1. Unoccupied behaviour : age effect.
 $F(1,444) = 4.009, p < .05, r^2 = .01$
2. Large swings : age effect.
 $F(1,444) = 11.66, p < .001, r^2 = .07$
: age effect.
 $F(1,444) = 12.02, p < .001, r^2 = .09$
3. Child initiates with caretaker : age effect.
 $F(1,444) = 26.42, p < .001, r^2 = .10$
: no. peers effect.
 $F(1,444) = 4.36, p < .05, r^2 = .01$
4. Caretaker initiates with child : age effect.
 $F(1,444) = 4.08, p < .05, r^2 = .01$
5. Vocal interaction with caretaker : age effect.
 $F(1,444) = 10.147, p < .001, r^2 = .03$
: no. of peers
 $F(1,444) = 7.55, p < .001, r^2 = .02$
6. Touching caretaker : age effect.
 $F(1,444) = 94.20, p < .001, r^2 = .21$
7. Cooperative with caretaker : age effect.
 $F(1,444) = 18.78, p < .001, r^2 = .05$
: no. of peers effect
 $F(1,444) = 3.91, p < .05, r^2 = .01$

APPENDIX 3 : REGULARITY OF CHILDREN'S VISITS TO THE PLAYGROUND

Data here is expressed in percentage form ie. the percentage of children who attended regularly, or quite regularly, etc.

At least once a fortnight	Once every 2-4 weeks	Not regular	Unknown
40%	3%	47%	10%

APPENDIX 4 : ESTIMATED AGE OF THE 5 KEY CARETAKER TYPES

CARETAKER	ESTIMATED MEAN AGE
Mother	27
Grandmother	55
Nanny	36
Father	29
Peer's mother	28