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HOME AND LABORATORY OBSERVATIONS OF PARENT-CHILD INTERACTIONS: A METHODOLOGICAL COMPARISON

by

Gloria L.K. Fox

A Thesis

Submitted to the Faculty of Graduate Studies

in Partial Fulfillment of the Requirements for the Degree

of Master of Arts

Department of Psychology

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ABSTRACT

Research on parent-child interaction has typically adopted a model of uni-directional influence in which parental effects on the child, or child effects on the parent have been examined. Only recently has research on parent-child interaction adopted a bidirectional model of influence, in which parent-child interaction is viewed as a sequential pattern of mutually dependent behaviours. These changes in the definition of parent-child interaction are necessitating changes in the methodology for studying the interaction process. In particular, observational procedures are being used to record sequences of behaviour, with naturalistic observation being strongly advocated. Yet research demonstrating important differences between naturalistic observation and laboratory observation which would justify the added expense and inconvenience of naturalistic observation has not yet been done. In addition, interaction research has been hampered by difficulties both in finding appropriate measures of interaction, and also in defining the appropriate unit for study. The present study used a measure of the interdependence of interactants' behaviours in comparing observations of mother-father-child interactions in the home with mother-father-child

interactions in the laboratory.

Six mother-father-child triads of non-disturbed families were observed for a 50-minute session in both the home and the laboratory, with order of setting being counterbalanced. All sessions were videotaped and subsequently coded in six-second intervals. Simultaneous and continuous coding of all members' behaviours was done using the behaviour codes of the Patterson, Ray, Shaw & Cobb Behavior Coding System (1969). Coded behaviours were grouped into five categories which varied along the dimension of facilitation of positive social interaction.

Data analyses were conducted separately for each family to ensure that patterns of interaction unique to a particular family would not be lost through a grouping procedure. A series of multiple correlations were calculated which, in predicting an interactant's behaviour, considered the behaviours of the other two interactants for the simultaneous and the preceding 15 intervals. The measure used for statistical comparison of home-laboratory differences was difference in magnitude of these time-lagged multiple correlations.

Significantly greater interdependence in the first session, regardless of setting, was observed for five of the six families. This indicates that degree of familiarity is an important variable influencing degree of interdependence in behaviour. More importantly, these

results provide no evidence to support the contention that setting (home-laboratory) differentially influences the patterns of mother-father-child interaction. The advantages and applicability of this measure of interdependence are discussed.

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INTRODUCTION

Parent-child interaction has become the topic of an increasing amount of study in the past several decades. During that time the definition of parent-child interaction has changed considerably, and concurrent with that change in definition have been changes in the methodology used to study interaction. The definition has been altered both with respect to the interpretation of the directionality of influence and also to the inclusion of nonverbal components of communication. The major changes in the methodology have been to the implementation of a model of interaction as a sequence of interdependent behaviours, and to the increased usage of observational procedures in both home and laboratory settings.

Interaction

Models of Interaction: Until relatively recently, parent-child interaction was typically conceptualized as a model of uni-directional influence. The earliest, and most frequently investigated model has been the effect of certain parental (primarily maternal) behaviours and attitudes on the behaviours of the child. The early longitudinal studies such as the Fels study (Baldwin, Kalhorn & Breese, 1945, 1949) and the Berkeley Study (Bayley & Schaefer, 1964) were among the first to assess

parental variables and relate them to the child's functioning. Others, notably Sears, Maccoby & Levine (1957) although acknowledging both constitutional differences in children and also the presumed differential effects children have on parents, subsequently have adopted the parent-effect model for their research purposes. Lewis & Goldberg (1969) have outlined several views regarding the means by which a mother's behaviour influences the infant's behaviour: mother as a source of stimulation, mother as a source of reinforcement for specific behaviours, and mother as the agent whereby the infant develops motivation for various behaviours. Despite the lack of acknowledged reciprocity in such a uni-directicnal, parent-effect model, it still is employed frequently (e.g. Escalona & Corman, 1971; Longabaugh, 1973).

Bell (1968,1971) first drew attention to the intrepretive invalidities of a parent-effect model, reinterpreting the findings of previous studies using a child effect model. However, his approach was again uni-directional. The child-effect model had previously been used by Moss (1967) in his investigation of the effects of the infant's age, sex, and state on the mother's responsivity, and by Yarrow (1965) in her analysis of differential behaviour on the part of a foster mother toward her two infant wards. Subsequently, Osofsky

and her colleagues (1970, 1971, 1971, 1972, 1972) studied the effects of different child behaviours on both mothers' and fathers' behaviours. Two techniques they used to induce relevant child behaviours were role-playing on the part of the children, and structuring of the situation (i.e. easy and difficult tasks) to induce different child behaviours (i.e. independent and dependent behaviour). The effect of a child's handicap on mother's behaviour has been investigated for hearing impaired children (Goss, 1970) and for speech disordered children (Kaplan, 1970). Lambert, Yackley & Hein (1971) have employed tape recordings of children's requests as the stimulus for parental response and have examined differences in parental responding. Again employing a child-effect model, Yarrow, Waxler & Scott (1971) analyzed nursery teachers' responsiveness as a function of the child's behaviour.

In contrast to these uni-directional approaches, the bidirectionality of interaction recently has been acknowledged in the interpretation of results, even though not always in the methodology of the research. Some research workers have viewed the reciprocal influences in fairly global terms. Wulbert, Inglis & Kriegsman (1975) interpret language delay in children as both a cause and a consequence of restricted mother-child interaction. Clarke-Stewart (1973) attempted to delineate the

reciprocal effects by suggesting that "maternal behavior influenced the child's intellectual development, whereas in the area of social relations the child's behavior influenced the mother". The bidirectionality of influence has been viewed by others as a sequential pattern of mutually dependent behaviour. Brazelton (1973), in his cross-cultural comparison of mother-infant interaction speaks both of the physical condition of the infant as influencing the mother's expectations regarding the health of the child, and of her expectations affecting the infant's capacity to adapt to environmental demands. This is similar to the infant-mother-infant approach advocated by Thoman (1974). Recent observational studies have focused on more minute behaviours in investigating the reciprocal nature of interactions. Behaviours occurring within short time intervals are coded or rated, with the sequence of coded behaviours then examined for patterns and relationships (e.g. Kogan & Wimberger, 1969; Bugental, Love & Gianetto, 1971; Patterson, 1971).

Verbal and Nonverbal Behaviours: A second alteration in the definition of parent-child interaction has been the inclusion of nonverbal behaviours. The necessity of measuring nonverbal behaviours is patently obvious when dealing with young children, but has not always been as obvious when dealing with older children and their parents. Consequently some studies employing observation

of parent-child or family interaction have failed to include nonverbal behaviour (Smith, 1970; Murrell, 1971). Schuman & Freshley (1971) demonstrated that access to video and audio tapes as well as typed transcripts of parent-child interaction yielded significantly different information than just access to the transcripts of verbalizations. Hore (1970) and Schmidt & Hore (1970) identified three dimensions of nonverbal behaviour between mother and child: physical contact, glances, and body inclination, and have found the first two to vary significantly with social class. Therefore, nonverbal behaviours should be an integral part of procedures designed to measure parent-child interaction. Changes in the methodology of research are necessary to incorporate the use of a bidirectional model of influence and the inclusion of nonverbal behaviours.

Family Attributes Affecting Interaction: A number of family and personal characteristics have been shown to be significantly related to differences in parent-child interaction. Education of mother has been demonstrated to be a significant variable with respect to mothers' interactions with their young children (Minton, Kagan & Levine, 1971), while social class has been linked to a significant extent to both the verbal (Kogan & Wimberger, 1969; Greenberg & Formanek, 1974) and the nonverbal (Hore, 1970) aspects of mother-child interaction. Both sex of

the parent (Bugental et al., 1971, 1972; Osofsky & Oldfield, 1971) and sex of the child (Moss, 1967; Lewis, 1972) have been related to significant differences in various aspects of parent-child interaction, as has birth order of the child (Rothbart, 1971) and sibling networks (Ciricelli, 1976).

Current Methodologies

Concurrent with changes in the interpretation of interaction have been changes in the methodology employed to investigate interaction. The concept of methodology includes both data collection procedures and statistical analysis techniques. Both encompass considerable variability with different types of information being derived from the differing methodologies.

Methods of Data Collection: The methods of data collection in investigating parent-child interaction can be grouped into three broad categories which vary with respect to the amount of structuring of the situation. Structure is defined as the limitation of the types of behaviours that can be demonstrated or that will be recorded. These categories are: (a) verbal reports, primarily of parents' attitudes and behaviours, (b) naturalistic observation of interaction in the home, and (c) laboratory task measurements and interaction observation.

Among the most structured and most studied methods for

assessing parent-child interaction is the verbal report. It includes both parental attitude and behaviour questionnaires, and parental interviews. In both cases the reliability and validity of the data obtained is dependent upon the parents' ability and willingness to divulge this information. Probably the most frequently researched questionnaire of this category is the Parental Attitude Research Inventory (PARI). The results have generally not been promising. Becker & Krug (1965) reviewed research on the PARI and concluded that "the PARI does not predict much very well". The assumption that reported parental attitudes are correlated with observed behaviours has not been upheld (Zunich, 1961, 1971).

One of the earliest systematic interview schedules on parent-child interaction was the one developed by Sears, Maccoby & Levine (1957) for use with mothers of kindergarten-aged children. Numerous factors have been identified when responses to only parts of the scale were analyzed (Sears, Maccoby & Levine, 1957; Dielman, Cattell, Lepper & Rhoades, 1971). This attests to the complexity of parent-child interaction, and to the advisability of restricting the topic of a single research study to only certain specific aspects of parent-child interaction. Adaptations of the interview schedule have been used in several multiple-measures studies of parent-child interaction (Lytton, 1973; Hetherington, Cox & Cox, 1975).

Given the nature of the interview schedule developed by Sears and his colleagues, its use is typically restricted to studies of parents of preschool or kindergarten-aged children.

Among the least structured methods for measuring parent-child interaction is naturalistic observation in the home. Early home observation studies used rating scales for the assessment of various parental variables (Baldwin, Kalhorn & Breese, 1945, 1949; Powers & Witmer, 1951). However, after Merrill Bishop's introduction of the use of precoded behaviour categories in 1951, this became the method of choice. This is apparent from the summary table in Lytton's (1971) excellent review of the methodologies of observation studies during the 1960-1970 time period. Precoded behaviour categories require operational definitions and consequently result in increased inter-rater reliability.

The degree of structure used in the studies utilizing home situations varies considerably. Barker & Wright (1951) in their study of the events in one day of the life of a young boy imposed no restrictions on activities that were performed or recorded. More frequently investigators observing interaction in the home have structured to some extent both the setting and the behaviours to be observed. Setting is structured by specifying the time of day of the observation (Baumrind, 1967), the types of activities

which are not permitted (e.g. television viewing, telephone conversations), and the family members to be present (Shaw, 1971). Recording of observation is structured by use of precoded behaviour categories which focus the attention of the observer on particular types of behaviours.

The amount and type of structuring of the situation will affect the type of information which will be obtained and the kinds of interpretations which can be made. Bell (1964), in advocating the use of structuring, demonstrated how parent and/or child behaviours in interaction can be restricted to certain classes of behaviour considered relevant to theory (e.g. achievement, dependency), and to more specific behaviours within those classes (e.g. urging, approving). The advantage of structuring the situation is to increase the probability of occurrence of the behaviours of interest. The disadvantage is that structuring of the assessment situation jeopardizes generalization of results to other situations.

The use of behavioural measurements and observation of interaction in the laboratory represent a balance between the relatively unstructured procedure of naturalistic observation and the highly structured method of verbal reports. Research workers have frequently employed differing levels of structure during one laboratory session (Hetherington, et al., 1975; Murrell, 1971). The

settings then vary from free play to highly structured tasks involving all participants. However, in all these situations the behaviour of participants is still more restricted than in home observations and more flexible than in verbal reports.

Comparisons of different methods of data collection have yielded equivocal results. Parents' reported attitudes and behaviours as measured by both questionnaires such as the PARI (Zunich, 1971) and by interview situations (Osofsky, 1972) have shown to be discrepant with observed behaviour in laboratory settings. Perhaps the most comprehensive comparison of the methodologies was carried out by Lytton (1973, 1974). He compared the methods of (a) naturalistic observations (using the Parent Child Interaction Code), (b) ratings based on interview, 24-hour diary, and observation, and (c) laboratory measures for assessing the child variables of compliance, independence, dependence, activity level, and speech, and numerous parent variables. His validity criterion was the extent to which these different measures yielded data that correlated with theoretical expectation. His findings indicated the ratings to be of greatest heuristic value, home observations to rank second, and laboratory measures third.

Lytton (1974) suggests that the low utility of laboratory measures might be a function of the

unfamiliarity of the setting for the children, or of the brevity of the testing session. He recommends using a wider range of experimental situations as a solution. However, Lytton's laboratory measures were ratings in each of the child behaviour areas as determined by the average relative frequency of those behaviours in several different situations. It is likely that a great deal of additional information could have been gathered if continuous observation with a precoded behaviour code had been used during the session. Hetherington, Cox & Cox (1975) used the Patterson, Ray, Shaw & Cobb (1969) coding system in both home and laboratory observation sessions. Though they present no statistical comparison of the methodologies, they report the interactions observed in the two situations to be "remarkably congruent".

In a recent observational study, Belsky (1977) reported finding home-laboratory differences in aspects of mother-infant interaction. Employing a design controlling for order of setting, Belsky found maternal activity and responsivity, and dyadic interaction to occur significantly more frequently when the dyad was being observed in the laboratory than wher being observed in the home. The behaviours of the twelve-month old infants were not, as a rule, significantly different across settings. In addition, he found strong individual differences among subjects, particularly among the infants.

The selection of the particular method of data collection to be employed depends upon the type of information required, and the resources available. Verbal reports, though the cheapest and most convenient method, can offer only fairly global information of somewhat dubious validity. Observation measures, though more expensive, are not as susceptible to biasing by the informant as verbal reports.

Home observations are typically regarded as being most representative of past parent-child interaction patterns. However, home observation is also both the most expensive and the least convenient method of data collection. Although the use of laboratory observations has been criticized for its possible invalidity (e.g. Bronfenbrenner, 1974), the degree to which laboratory observations are similar or dissimilar to home observations has not been adequately investigated. If laboratory observations using precoded behaviour categories can be demonstrated to yield data similar to home observations, and if the types of data distortions that may be present can be identified, then laboratory observations may be a reasonably valid and relatively convenient method of obtaining detailed information about parent-child interaction.

Observation Procedures: There are several behavioural observation procedures currently in use. The least formalized of these is the practice of making ratings of the relevant behaviour on a time-interval schedule. Using this approach, Osofsky and her colleagues (1970, 1971, 1971, 1972, 1972) rated children's dependent and independent behaviours, and various parental behaviours. Similarly, Bugental, Love & Gianetto (1971) and Bugental, Love & Kaswan (1972) rated each dyad member on the dimensions of activity, direction and evaluation. Unfortunately, such ratings do not readily lend themselves to use by other investigators, and consequently there is no accumulating body of information about the rating procedures. A more formalized observation code is the Bales Interaction Process Analysis which has been applied to the study of parent-child interaction (Miller, 1974). However, it does not make explicit use of nonverbal behaviours, and, therefore, its usefulness is limited. Two observation scales which are based on precoded behaviour categories and which include both verbal and nonverbal behaviours are the Parent Child Interaction Code (Lytton, 1973) and the Human Interaction Scale (White & Watts, 1973). The disadvantages of these two scales are that they are intended primarily to be used with preschool and kindergarten-aged children, and that they require long training periods for the observers to establish acceptable

levels of inter-rater reliabilities. Kogan & Wimberger (1966) have adapted an observation scale initially used for primate interaction research for use with mother-child dyads. It requires that initial observations be coded and the codings then be transformed into ratings on the dimensions of status (dominant--submissive), affect (hostile--warm) and involvement. Again it has been used primarily with preschool and kindergarten-aged children (Kogan & Wimberger, 1966, 1969, 1969; Kogan, Wimberger & Bobbitt, 1969; Wimberger & Kogan, 1972), although it has also been used with slightly older children (Kogan, 1972).

Patterson, Ray, Shaw & Cobb (1969) have developed a system for observing family interactions which is more acceptable for several reasons. The system consists of precoded behaviour codes, makes use of both verbal and nonverbal behaviours, can be learned relatively easily, and can be used with children of various ages. It was specifically designed for dealing with families of children demonstrating deviantly aggressive behaviours, thus limiting its focus of interest. The 29 behaviours which comprise the coding system are operationally defined, and are sufficiently inclusive to provide a code for almost all social behaviours which typically occur in family interactions. This means that a recording of behaviour would have few uncoded gaps in the sequence. Although the 29 behaviours can be used as the data source

(e.g. Hetherington, et al., 1975) they are more frequently combined into larger categories such as prosocial, deviant, and neutral behaviours for children, and aversive, positive and neutral behaviours for parents (e.g. Shaw, 1971; Patterson, 1971; Wahl, Johnson, Johansson & Martin, 1974).

The Patterson, Ray, Shaw & Cobb Behavior Coding System (BCS) was first developed as a means of collecting naturalistic baseline data for behaviour modification training programs in the home and school. As such, up to the present, it has been used primarily for naturalistic observation in the home and school. To what extent the observation of family interaction in a laboratory setting is comparable to observations in the home still needs to be demonstrated. The present research study addressed itself to this issue.

CURRENT STATISTICAL ANALYSES:

As well as alterations in the definition of parent-child interaction and the methods utilized for measuring it, there have been changes in the statistical procedures used to analyze the data. The most frequently used procedure has been to tally the frequency of occurrence of the various coded behaviours. These summary measures are then used to make comparisons across the different coded behaviours, across different groups of people, or across different situations. This statistical

procedure is relatively easy to apply, and yields relatively general information. However, its shortcoming is that this method fails to reflect the dependent and sequential nature of interaction.

Recent applications of computer technology have facilitated a sequential analysis of interaction. A Markov model has been proposed to handle the definition of dyadic interaction as a series of conditional probability statements (Haupt & Gewirtz, 1968). It is then possible to separate those contingencies between the antecedent acts of one member and the consequent acts of another member which are relatively invariant, from those acts which show no apparent relationship. The operation of a relatively invariant contingency can then be tested by comparing the conditional probability of behaviour B occurring given the prior occurrence of behaviour A, to the chance probability of B occurring. This approach or a modification of it has been used by Gewirtz & Gewirtz (1969) in comparing infant caretaking patterns in four environments, and by Kogan & Wimberger (1969) in illustrating the uniqueness of interaction styles between mothers and their young children.

An alternative method for the study of contingency probabilities frequently has been employed with the Behavior Coding System (Shaw, 1971; Patterson & Cobb, 1973; Wahl, Johnson, Johansson & Martin, 1974). With this

method, behaviours of interest have been selected (e.g. child's negative behaviour) and the consequent behaviours of the other interactants noted. Comparisons have then been made between the probabilities of those classes of behaviours occurring contingent upon the prior occurrence of the selected behaviour, and the probabilities of those classes of behaviours occurrring generally in the session. The same method can be employed for preceding behaviours. Typically, only the immediately preceding or succeeding behaviours have been examined. It would seem likely that behaviours occurring earlier or later than the immediately preceding or succeeding behaviours would also be related to the selected target behaviour.

Purpose and Intention: The general purpose of the present study was to determine to what extent information obtained from observations of parent-child interaction in the laboratory is similar to information obtained from observations in the home. Since past research has too frequently only focused attention on the impact of the father when he is not present (i.e. the effects of father absence), the present study included observations of father, mother, and child.

The findings of Kogan & Wimberger (1969) and Belsky (1977) have illustrated the diversity of mother-child interaction styles. For this reason, and given the exploratory nature of the present study, the data

collected in the present study were analyzed individually for each family. Using this idiographic method of analysis, the behaviours of a family observed in each setting are viewed as a representative sampling of each particular family's population cf behaviours, and are not immediately generalizable to the behaviours of other families.

The concept of parent-child interaction which was employed in the present study views interaction as a sequence of behavicurs which are mutually dependent upon the behaviours of the other interactants. The extent to which one interactant's behaviour can be predicted given the previous and present behaviours of the other interactants both reflects this dependency and provides a measure for comparison between the home and laboratory settings.

The specific intention of the study was as follows: For each family, the magnitude of the relationships among behaviours (i.e. the extent to which they are interdependent) were compared between settings. Given the equivocality of previous research findings on this issue (e.g. Hetherington, et al., 1975; Belsky,, 1977) no predictions of significant differences were made.

METHOD

Participating Families: Several selection criteria were employed in recruiting families, to ensure that participating families were homogeneous with respect to several of the family attributes which have been demonstrated to be related to aspects of family interaction. The selection criteria in recruiting the mother-father-child triads specified that (a) the child be male, (b) the child be between the ages of four and one-half and seven years, (c) that the child be either the first-born child of the family or be at least five years younger than the next youngest sibling, (d) that mother and father be high school graduates and/or have some post-secondary college/university education, (e) that mother, father, and child had lived together for at least the preceding two years, (f) that during the preceding two years no member of the triad had been referred for extensive psychological or psychiatric treatment, and (g) that English was the language spoken in the home.

A variety of referral sources were contacted in recruiting families to participate in the study. These sources included several daycare centres, nursery schools and churches of the Ft. Richmond, Manitoba area, in addition to recruiting from the students enrolled in summer courses at the University of Manitoba in July of

1976. Of the six families participating in the study, three were contacted through one church (families #1, 2, 3), one family through a daycare centre (#5), and two families through a nursery school (#4, 6)*.

The participating families met the selection criteria with the exceptions that one mother had only completed the tenth grade and additional secretarial training (#3), and one child, although the oldest son in the family, had a sister only three years his senior (#1). The only other child who was not a first born had siblings who were at least seven years older than himself (#5).

Most parents were in their mid-twenties to early thirties, although in one family both parents were in their early forties (#5). All had lived together continuously since marriage, with length of marriage ranging from seven to eighteen years. All families had two or three children, with siblings of the participating child typically being younger. All fathers were employed full-time and worked out of the home. Only one of the fathers travelled out of town extensively on his job (#5). Two of the mothers were not employed out of the home (# 3,6), three were employed part-time out of the home (#1, 2, 4) and one mother was a full-time university student

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*Special thanks to the Ft. Garry Mennonite Brethren Church, the University of Manitoba Campus Daycare Centre, and the nursery school of the Faculty of Home Economics, University of Manitoba.

(#5).

Observational Procedures:

Initial contact with families: In the initial contact, the experimenter identified herself to the parents, her university affiliation, and her reason for contacting them. The method by which their names had been obtained was explained, as well as the fact that they were under no obligation to the referring source (i.e. church, nursery, daycare) to participate in the study. The purpose of the study was described to them as being to determine whether or not patterns of behaviour could be found in the interaction of children and parents of normal families, and to see whether or not those patterns were the same in different settings. Families were informed that participating in the study would require a total of approximately three hours of their time, one-half of the time in a home setting, and one-half in the laboratory. They were also informed that they would be reimbursed for any babysitting expenses which they might incur.

Observation sessions were scheduled so that three families were seen in the laboratory first and home second (#1, 3, 5), while for the remaining three families the order was reversed, home first and laboratory second (#2, 4, 6). As families agreed to participate in the study, they were alternately assigned to one of the two conditions. For each family both sessions occurred at the

same time of day, the second session following one or two days after the first. This meant that although different families were seen at different times of the day, depending upon their schedules, for each family the time of day was held constant across both sessions, and that these sessions were scheduled with a minimum and similar amount of time between sessions. For all but one family this was possible. In this one case, because of unforeseen circumstances and father's travelling, the second session was rescheduled for three weeks later (#5).

Structure of the Setting: For each family the first several minutes of the first session were used by the experimenter to again explain the purpose of the study. This was done to ensure that both spouses were equally well informed as to the purpose of the study. The experimenter acknowledged the fact that the persons might feel somewhat constrained in knowing that their behaviours were being videotaped, but asked them to act as naturally as possible. They were also told that there were no "right" or "wrong" ways to behave, and that the videotapes would be handled in a confidential manner. After some basic demographic data had been collected and family members had an opportunity to ask questions, the experimenter left the immediate area and videotaping began.

For both home and laboratory sessions, only mother,

father and son were present. Other family members were requested to remain outside the observation area. Interactions from which other family members had been excluded may have differed somewhat from typical family interactions. However, observation of only the triad was used to increase the probability of direct interactions among the parents and the focal child, and to simplify the coding of behaviours.

Additional restrictions imposed for the home observation session were similar to those employed by Patterson, Cobb & Ray (1973) and Shaw (1971). They were: (a) no guests could be present during the observation, (b) the movement of mother, father, and son was restricted to one room to ensure adequate coverage with the videotape camera, (c) no telephone calls were to be initiated; incoming calls were to be answered briefly, (d) no television viewing was permitted, (e) no conversations with the observer were to occur, and (f) the observer's equipment was not to be handled.

In the laboratory a combination of relatively structured and relatively unstructured tasks was used, similar to those of previous research (Kogan & Wimberger, 1966; Leon, 1971; Hetherington, et al., 1975). Mother, father and son were ushered into a small observation room containing living room furnishings and an assortment of toys appropriate to the age of the child. No adult games

or reading material were present in the room. If the laboratory session was the family's first session, basic demographic data were collected. The family was then asked to do whatever they wished in the room for the first half of the session and were informed that the experimenter would have more specific tasks for them to do in the second half of the session. The experimenter left the room and videotaping began from behind the one-way mirror. After approximately 25 minutes, the experimenter returned with juice and cookies, a questionnaire, some art materials, and a Lego set. The family was invited to have a snack first, then the three of them were asked to "make something together", using either the art materials or the Lego set, the choice of medium being theirs. The parents were asked to use the last ten minutes of the session to complete the questionnaire together. Items on the questionnaire dealt with the parents' perceptions of their child's abilities and interests. The questionnaire was used to structure the situation so that the parents were occupied on a mutual task, and that the child was excluded to some extent. Information derived from the questionnaire was not used in the analysis.

The use of observation as the method for data collection entails several unique problems which are discussed below:

Observer Effect: The extent to which the presence of an observer affects the interaction between parent and child has not been clearly established. Johnson & Bolstad (1973) (pp. 45-47) have reviewed previous research on observer effect and have outlined four factors that contribute to observer effect: (a) conspicuousness of the observer, (b) individual differences of the subjects, (c) personal attributes of the observer, and (d) explanation of the rationale of the observation. In the present study, the conspicuousness of the observer varied over the the two settings, with the observer being immediately present in the home, and being behind a one-way screen in the laboratory setting. Since these are realistic representations of the manner in which data is typically collected in these situations, no attempt was made to equalize the degree of conspicuousness of observer over the two conditions. To allow for some adaptation of the family to the fact of being video-taped, the first ten minutes of observation in both home and laboratory sessions were not used in the statistical analysis.

The second factor, individual differences of the subjects regarding observer effect was, and likely cannot, be controlled. Third, all the contact with the study which the families had was with the author of the study--a female graduate student in her mid-twenties. This

eliminated variance due to different observers. And finally, a modified rationale of the purpose of the research was explained to the families, emphasizing interest in the unique interaction styles of average families and placing greater emphasis on the behaviour of the child than of the parents.

Stability of the Data: Stability of the data refers to the efficiency of event or time sampling, and to a large extent is influenced by the length of the observation session. Analogous to increasing the reliability of a test by including extra items, the stability coefficient of the data, calculated as an average of the split-half reliability coefficients (Cobb, 1972) can be increased to some extent by having longer observation periods. Shaw (1971) reports asymptotic levels of stability for most of his families to have been reached by fifty minutes of observation time spread over ten observation sessions of five minutes each. In the present study since all observation sessions in each session occurred consecutively rather than intermittently, it was decided that forty minutes of coded behaviour would be sufficient to ensure relatively stable data. Therefore, observation sessions for each setting lasted for approximately fifty minutes, with the first ten minutes being discarded, and the behaviours of the remaining forty minutes being coded.

Coding of the Behaviours: Since the intent of the study was to make home-laboratory comparisons of the relationships of the family members' behaviours, taking into account the sequential nature of interactions, it was important that all members' behaviours during all time intervals be coded. To accomplish this, the fairly inclusive set of behaviour codes of the Patterson, Ray, Shaw & Cobb Behavioral Coding System (BCS) (1969) described earlier, were used with a few slight modifications (see Appendix A). The application of these behavioural categories in the present study differed somewhat from its traditional usage. Rather than coding only the behaviours of individuals when interacting with a target individual, in the present study all individuals' behaviours were coded simultaneously and continuously. This necessitated the inclusion of a new behaviour category of "No Attention".

Examination of the interactions of a pilot family revealed that interactants would frequently simultaneously behave differently toward each of the other two interactants. Therefore, it was decided that for each interactant, his behaviours toward the other two interactants would be coded separately. This resulted in six behaviours being coded: father toward mother (Fm), father to child (Fc), mother to father(Mc), mother to child (Mc), child to father (Cf), and child to mother

(Cm).

Previous research with the BCS had indicated that an average of five behaviours were coded during each thirty second time unit (Shaw, 1971). Gonzalez, Martin & Dysart (1973) had successfully employed seven second intervals. For reasons of computational ease, a time unit length of six seconds was used. For each time unit, each of the behaviours could receive only one behaviour code. As the time during observation sessions elapsed, it was automatically recorded on the videotape. A tape recording of an electronic metronome clicking every six seconds with a louder click at every minute was played near the microphone of the audio track of the videotape. The presence of the clicking noise was not apparently bothersome to any of the family members.

Observer Bias: Observer bias refers to the systematically biased manner in which an observer may uniquely perceive or code subjects' behaviours. To prevent distortion of the data due to observer bias, several safeguards were employed. First, one-half of the videotapes were randomly assigned to a rater who was unaware of the experimental intention, while the remaining one-half were coded by the author. Since the experimental intention dealt with fairly global relationships among family members' behaviours, and the actual coding of each session required thousands of ratings of behaviours, each behaviour

occurring within a very short time period, the opportunity for significant observer bias to distort the data in a systematic manner to directly affect the experimental intention seems remote. Second, both coders trained on the use of the coding system until inter-rater reliability exceeded r=.80. Reliability was calculated as the number of agreements over the number of agreements plus disagreements. Each coder also conducted three random checks of reliability on tapes which had already been coded by the other coder. When inter-rater reliability dropped below r=.80, mutual training on the coding system was reinstated.

DATA ANALYSIS AND RESULTS

Analyses were conducted separately for each family. The data for each family in each setting (home or laboratory) consisted of approximately four hundred intervals in which each of six behaviours (Fm-father toward mother, Fc-father to child, Mf-mother to father, Mc-mother to child, Cf-child to father, Cm-child to mother) had been coded using one of 31 possible behaviour codes. Due to the presence of additional persons or the absence of one or more members of the triad, sessions varied somewhat in number of intervals with codable behaviours. See Table 1 for the number of six-second intervals of coded behaviour for each session for each family.

Insert Table 1 About Here

The coded behaviours of each of the time intervals were viewed as representing separate measures of the family's interaction. In more conventional terms, the coded behaviours of each time interval were viewed as separate "cases", with total "n" equalling the total number of

intervals in the session. Each of the coded six-second behaviours is then viewed as a sampling from the population of possible behaviours of that particular family. Generalization to the behaviours of other families is limited.

The 31 behaviour codes were initially reduced to the three categories of behaviours, prosocial, neutral, and deviant which have been used previously (e.g. Shaw, 1971; Patterson, 1971; Wahl, Johnson, Johansson & Martin, 1974). Preliminary inspection of the data indicated that approximately 85% of behaviours were being categorized as neutral. Although the rates of occurrence of deviant behaviour (2-6%) were similar to those reported by other researchers (e.g. Shaw, 1971), it also appeared that a great deal of potentially meaningful information was being lost in the use of the all-encompassing "neutral" category. Therefore, this category was expanded into three categories, to make a total of five categories of behaviours. These five categories were conceptualized as varying in the degree to which they facilitated positive social interaction , with 'one' indicating a low and 'five' indicating a high degree of facilitation of positive social interaction (see Appendix B for further details of the categories and their formation). Inter-rater reliability, based on the data recoded to the five categories, was calculated for the six reliability

checks. Inter-rater reliability ranged from r=.74 to r=.87, with a mean reliability of r=.81.

Preliminary anlyses were conducted on the data of two randomly selected families to provide information about the nature of the relationships among the interactants' behaviours, with particular interest in seeing how the size of the relationship between two behaviours is affected by their temporal distance. To accomplish this a procedure similar to autocorrelation was used. A series of simple Pearson correlations were computed. However, unlike the autocorrelation procedure in which a behaviour is correlated with itself in a series of numerous preceding or succeeding intervals, in the present procedure behaviour A was correlated with behaviour B in a series of numerous preceding time intervals. More specifically, each of the six behaviours (Fm, Fc, Mf, Mc, Cf, Cm) served as the criterion variable and was correlated separately with each of the remaining five behaviours (predictor variables), with the predictor variable being lagged serially from zero to twenty intervals. These are series of intervals which begin at the simultaneous interval and go back successively through the intervals which preceded the current interval, up to the twentieth preceding interval. As an example, Fm (criterion) was correlated with Cm (predictor) at every interval from the simultaneous to the lag twenty interval.

This resulted in a total of over 750 correlations (36 comparisons at 21 time points each) for each family. These correlations were plotted on graphs, and these correlograms were examined. No obvious and consistent patterns of relationships could be detected, but it was apparent that for most behaviours a rapid decay in the size of relationship with time lag was not present, and that these lagged correlations' were frequently not near zero even by lag 20. This emphasized the importance of considering behaviours more temporally distant than the immediately preceding when attempting to predict the behaviour of another interactant. The sheer quantity of information also indicated the need to summarize the data more concisely.

The measure used for significance testing of difference between the home and laboratory settings was the extent to which one interactant's behaviour can be predicted if the simultaneous and preceding behaviours of the other two interactants are known. This measure of predictability, also called the strength of interdependence, was calculated through a series of multiple correlations. Six multiple correlations were calculated for both home and laboratory setting, one correlation for each of the two behaviours of each interactant. One of an interactant's behaviours was considered the criterion variable, with the four behaviours of the other two interactants acting as

predictor variables. For example, in predicting the behaviour Fm, the behaviours Mf, Mc, Cf, and Cm were used as predictor variables. The possible predictor variables in the correlations included both the simultaneously occurring behaviours and the preceding or lagged behaviours to lag 15, with the simultaneous behaviours receiving priority, as explained below.

The computer program used was the Statistical Package for the Social Sciences (second edition) Multiple Regression Analysis program (Nie, Hull, Jenkins, Steinbrenner, Brent,1975) with the special lagged data feature (Nie & Hull, 1977). The capabilities of the program allowed the behaviours occurring in the preceding fifteen time intervals (preceding ninety seconds) to be considered for entry into the regression equation. The model which was adopted for analysis viewed the simultaneously occurring behaviours to be relatively more important than preceding behaviours, with no hierarchy of importance existing among preceding behaviours. In the calculation of the multiple correlation, the simultaneous predictor behaviours were forced into the equation first, with the behaviours of the preceding intervals then given opportunity to enter the equation. A maximum of ten possible predictors was allowed, if the predictors also met the inclusion criteria of tolerance equal to .36, and F value to enter equal to 3.0. The maximum number of ten

predictors was used to avoid having a cumbersomely large number of predictors. Inspection of preliminary regressions with unlimited numbers of predictors had indicated that most predictors after the seventh or eighth did not increase the size of the multiple regression correlation by a meaningful amount. The tolerance value of .36 was selected to avoid the problem of multicollinearity. It ensures that the predictor variables entering the equation were not highly correlated amongst themselves (i.e. tolerance level of .36 means that only up to 64% of the variance between predictors or combinations of predictors can be shared; or that the highest intercorrelation between predictors to be allowed into the equation is r=.80). High correlation among predictors (multicollinearity) makes interpretation of the multiple correlation between predictor and criterion variables difficult, and if severe enough may make the calculation of the multiple correlation impossible (Nie et al., 1975; Kerlinger & Pedhazur, 1973; Darlington, 1968). The F to enter value of 3.0 specifies that the amount of unique variance accounted for by each predictor about to enter the regression equation, achieves an F value of at least 3.0, which is approximately at a p=.05 level given an N of 400.

The resulting multiple correlations were tested for significant differences between the home and laboratory

setting condition. The differences between settings in the magnitude of these correlations were tested for significance using Fisher Z transformations for the correlations and the formula presented in Appendix C, adapted from the formula presented in Glass & Stanley (1970, p. 308). The magnitude of the correlations and the significance of the differences between settings are reported in Table 2. Inspection of this table reveals that the size of the correlations varies from R=.290 to R=.793, with most correlations being around r=.50-.60. This accounts for a substantial proportion (25-36%) of the total variance. There are no apparent trends of higher correlations for particular families, or for particular members within a family (e.g. fathers, mothers, sons). The reported probability values indicate that 21 of the 36 differences observed were significant at a probability level equal to or less than .05.

Insert Table 2 About Here

The results presented in Table 2, only the comparisons between settings which were significant at the 5% or less

probability levels are summarized in Table 3, along with the order of sessions. For each family, six differences were tested at p=.05. Because these differences are all based on the same set of data (lack of independence) it is not possible to calculate the exact level of probability that any of the observed significant differences are not really due to chance. The Bonferroni theorem regarding multiple "t" comparisons states that the actual experimental probability level will be less than or equal to the sum of the individual probability levels (Miller, 1966). Consequently, in the present study the maximum possible probability level would be p=.30 (.05 x 6). However, due to the exploratory nature of this study, this Type I Error rate was considered acceptable.

Insert Table 3 About Here

The results of Table 3 demonstrate several significant (probability equal to or less than .05) differences in the magnitude of relationships between the two settings for each family. For five of the six families, these differences primarily indicate higher relationships among

the interactants during the first session of being observed, regardless of setting, with 17 of the 19 significant differences occurring with a higher measure of interdependence for the first session. For the remaining family (#4), the maternal behaviours were the only ones showing significant differences between sessions, and the size of the relationships were greater in the second session (home setting).

DISCUSSION

Other researchers and writers have questioned the generalizability of laboratory-derived information on parent-child interaction. The findings of the present study lend credence to the comparability of laboratory observations with home observations of mother-father-child interactions. Unlike the earlier findings of Lytton (1974) and Belsky (1977), the current findings failed to indicate consistently biased differences between the home and laboratory observations. Instead, they indicated that for the families which were observed in the present study, the degree of interdependence in behaviour seemed more influenced by familiarity, that is whether they were being observed for the first or the second time.

Where significant differences in degree of interdependence occurred between settings, the magnitude of this interdependence was typically reduced in the second session, regardless of setting. This pattern of reduced relationships in the second session was true for five of the six families observed. It is interpreted as meaning that when being observed, these families initially were more influenced by the behaviours in which the other interactants were engaging. Being in a somewhat socially uncomfortable and unfamiliar situation, interactants initially monitored the behaviours of each other to a greater degree and more readily utilized these behaviours

as cues for their own behaviours. This decrease in dependence in the second session does not appear to be unique to any one family member. It applied to at least one of the behaviours of each family member for each of the five families.

It is not readily apparent why the sixth family's (#4) pattern of interaction in the two settings was dissimilar to that of the other families. This family did not differ from the other families on the demographic data reported earlier (e.g. size of family, age and education of parents, sibling network) or on experimental procedures. In addition, this family (like all other families) reported that no important event had occurred between sessions. It is possible that for some unknown reason quite unique to this family, setting became a very salient variable whose effect masked the familiarity effect. However, if setting were this salient a variable, the results of Belsky (1977), and the contention of Baumrind (1968) that parents have more control over their behaviour in the laboratory than in the home would have predicted greater interdependence in the laboratory setting (first session) rather than the home setting (second setting). This is the reverse of what was observed for this family. No obvious explanation for their unique pattern of interdependence in behaviours can be offered. This serves as a reminder that the experimental procedure applied to

such a complex phenomenon as family interaction cannot control or measure all the influences which impinge upon the interactions. The results for the other five families illustrate that the typical pattern for these families is for greater interdependence of behaviour in the first session, with a lesser degree of interdependence in the second session, regardless of the order of the setting of the sessions. This phenomenon of "familiarization" should be replicated and investigated further. The findings of such investigation may illustrate the necessity of "familiarization" sessions.

Unlike the findings reported by Belsky (1977), the current findings fail to demonstrate any significant difference between home and laboratory observations which consistently favours one setting. This failure to detect differences between settings is not, however, attributable to insensitivity of the measure for comparison, since differences due to order of session were detected. This apparent incongruity in results between the Belsky results and the current results may be viewed in several ways. The studies differ in the measures employed, the Belsky results being based on comparison of frequency of occurrence of different behaviours, and the present results being based on comparisons of magnitude of relationships among interactants behaviour. It is quite possible that the frequency of behaviours could be higher

in the laboratory setting than in the home setting, while at the same time, the degree of relationship or interdependence among behaviours in each setting would remain similar.

Unlike much previous research, the present study of parent-child interaction included the father of the families. Not only are the observations of father-child interactions and of mother-father interactions added, but all interactions occur in the context of a triad. The lack of consistent discrepancy across settings demonstrated in the present study may be due to the addition of the father. This is not to assert that the fathers of these families are necessarily "the stabilizing influence" in the interactions of the families, but that the triad of mother-father-child is a much more complete family unit, and more closely represents the natural support network of the family. Bronfenbrenner (1974) has criticized much laboratory research on developmental studies because too frequently one or two family members are studied in isolation. It may well be that by observing more complete units of the family, the effect of setting loses its potency.

Finally, the context of the observations, including the physical setting, the instructions, the restrictions, and the explanations provided are likely important. In the current study, the contexts of the two settings were

structured to be representative of previous research. However, the two contexts may have been more similar to each other than in previous research. In the present study, under both conditions the family members were required to remain in one room for the duration of the observation period, thus maximizing the amount of interaction, and minimizing the distraction of other persons or activities. In addition, the triad was observed without other family members present in either setting. Belsky did not report whether or not other family members were present during the home observation. Changes in one or more of these procedures could be responsible for differences in findings among studies. Future research is required to determine what factors contribute to similarities and dissimilarities between settings.

The measure of comparison used in the present study, a measure of interdependence of behaviours is viewed as an improvement over earlier measures. It allows for an actual calculation of the extent to which one interactant's behaviours can be predicted given the preceding and simultaneous behaviours of the other interactants. The present study used both continuous recording of behaviours occurring in short time intervals, and a lagged interval method of analysis. This allows for the relationships between a target individual's behaviour

with the numerous preceding behaviours of other individuals to be illustrated and measured. This interdependence measure is seen as approximating much more closely the essential nature of interaction than many of the previously employed measures. It differs from global summary measures in reflecting more of an interactional aspect, and differs from the Markov chain method in allowing for multiple predictors, and for predictors from numerous preceding intervals, whereas the Markov method deals with only the immediately preceding behaviours.

The use of this measure could have wide application. The present study has restricted itself only to comparisons of the magnitude of interdependence between settings. However, the structure of these interdependencies could also be explored, determining to what extent the same behaviours were contributing to predictability in the two settings. Following such a line of research would require considerable effort, but would also shed light on some of the intriguing aspects of interdependence in parent-child interactions.

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TABLES 1-3

Table 1: Number of Intervals in Each Session

Family	Laboratory Setting	Home Setting
#1	386	394
#2	392	380
#3	393	346
#4	385	374
#5	354	399
#6	393	351

Table 2: Comparison of Home-Laboratory Correlations

Behaviours	Laboratory Setting	Home Setting	p
Family #1			
Fm	.648	.523	.01
Fc	.567	.576	.50*
Mf	.632	.573	.20
Mc	.549	.793	.001
Cf	.404	.588	.001
Cm	.599	.768	.001
Family #2			
Fm	.486	.529	.45
Fc	.545	.339	.001
Mf	.425	.538	.05
Mc	.716	.344	.001
Cf	.412	.386	.50*
Cm	.658	.331	.001
Family #3			
Fm	.607	.670	.15
Fc	.470	.642	.001
Mf	.518	.702	.001
Mc	.399	.490	.15
Cf	.439	.454	.50*
Cm	.300	.607	.001
Family #4			
Fm	.390	.441	.45
Fc	.290	.378	.20
Mf	.371	.581	.001
Mc	.401	.517	.05
Cf	.351	.451	.10
Cm	.464	.50*1	.50*
Family #5			
Fm	.458	.443	.50*
Fc	.416	.544	.03
Mf	.473	.691	.001
Mc	.367	.599	.001
Cf	.422	.637	.001
Cm	.403	.600	.001
Family #6			
Fm	.677	.541	.01
Fc	.554	.455	.10
Mf	.658	.518	.01
Mc	.574	.512	.30
Cf	.50*8	.484	.50*
Cm	.525	.357	.01

*p = or >.50

Table 3: Summary of Differences ($p < .05$) Across Home-Laboratory Setting

Order= Home-Laboratory	Order=Laboratory-Home
Family #1	Family #2
Fm sig (lab)	Fm x
Fc x	Fc sig (lab)
Mf x	Mf sig (home)
Mc sig (home)	Mc sig (lab)
Cf sig (home)	Cf x
Cm sig (home)	Cm sig (lab)
Family #3	Family #4
Fm x	Fm x
Fc sig (home)	Fc x
Mf sig (home)	Mf sig (home)
Mc x	Mc sig (home)
Cf x	CF x
Cm sig (home)	Cm x
Family #5	Family #6
Fm x	Fm sig (lab)
Fc sig (home)	Fc x
Mf sig (home)	Mf sig (lab)
Mc sig (home)	Mc x
Cf sig (home)	Cf x
Cm sig (home)	Cm sig (lab)

*Setting in parentheses following a statement of significance indicates setting in which the relationship is strongest.

APPENDICES A, B, C

APPENDIX A

BEHAVIOUR CODES[1] AND CODING PRIORITIES

BEHAVIOUR CODES

This section is divided into two main sections, First Order Behaviours and Second Order Behaviours. The reason for the division into two sections is for the observer to have a knowledge of priorities in coding behaviours. It is impossible to code every behaviour emitted, and many times a person will emit three or four of the behaviours listed in the manual. In order to resolve the problem and keep the number of behaviours attributable to one individual down to one per sequence, some behaviours are designated as Second Order Behaviours, which means that they are never coded when a First Order Behaviour can be coded. It is up to the discretion of the observer what behaviours to choose among several behaviours within the same order. Since the observer can code only one, she/he must pick those behaviours that best describe the social interaction that is occurring.

Not only have behaviours been divided on a priority

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1. BEHAVIOUR CODES FROM G.R. PATTERSON, R.S. RAY, D.A. SHAW & J.A. COBB. "MANUAL FOR CODING OF FAMILY INTERACTIONS' (SIXTH REVISION, 1969). ALL MODIFICATIONS FOR THE PRESENT STUDY ARE INDICATED IN THE FOLLOWING TEXT.

basis, but also on whether they are verbal, non-verbal, or a combination. This is to aid the observer in cataloguing the codes, and perhaps in learning them with greater ease. Behaviours are listed alphabetically within each subarea.

First Order Verbal Behaviours

CM(COMMAND): This category is used when a direct, reasonable, and clearly-stated request or command is made to another person.. The statement must be sufficiently specific as to indicate clearly the behaviour which is expected from the person to whom the command is directed. The command need not request immediate compliance, e.g. father tells the son that he has to mow the lawn on Saturday. However, the observer is always to indicate whether the command is complied with. In the example cited, the son could indicate verbally that he is or is not going to comply with the father's request. In those instances where the compliance will not follow directly, but is likely to occur before the observer is finished coding on the subject's observation sheet, the immediate response should be coded and when compliance or non-compliance occurs, that should be coded. For example, mother tells the child, who is the subject, to wash his hands before coming to dinner. The child tells his mother that he will and continues whatever he was doing, but in a minute he goes to the sink and washes his hands. The

response to the mother's command would be the child's talking and compliance would be coded when he began washing his hands. Note that many questions are most appropriately coded as talk (TA) rather than as CM. For example, "What's for dinner or "What time is it would be coded TA, while "Would you go into the living room and tell your father that dinner is ready or "Will you help me lift this table would be coded as CM.

CN (COMMAND NEGATIVE): This is a command which is very different in "attitude" from the reasonable command or request described above. This kind of command has some of the following characteristics:

1. Immediate compliance is demanded.
2. Aversive consequences are implicitly or actually threatened if compliance is not immediate.
3. It is a kind of sarcasm or humiliation directed to the receiver.

An example of the implicit use of aversive consequences is indicated by the tone of voice as well as the statement: Mother tells Johnny to shut the door in a normal tone of voice; he does not comply; she then raises her voice and says, "You'd better shut that door, young man."

CR (CRY):Use this category whenever a person cries. There are no exceptions.

HU (HUMILIATE): This category should be used when the agent makes fun of, shames, or embarrasses the subject

intentionally. Examples: laughing in a derisive manner at the subject when he attempts to tie his shoes; telling the subject in a firm tone of voice, "Boy, you are really stupid"; telling the subject in a strong tone of voice, "You are a cheater", when the subject is playing a game. The observer must be careful to differentiate between playful verbal statements or nicknames and humiliate, e.g. some people call each other "stupid" but more in terms of endearment than of humiliation. The tone of voice, as well as the language used should be considered by the observer before a decision is made to code HU or some other appropriate code.

LA (LAUGH): Used whenever a person laughs in a non-humiliating way. For example, a person tells a joke and the other people laugh at the joke. However, if one of the people who heard the joke laughed in a derogatory manner at the person for the way he told the joke, that would be coded as HU and not as LA.

NE (NEGATIVISM): This category is only used when a person makes a statement in which the verbal message is neutral, but which is delivered in a tone of voice that conveys an attitude of "Don't bug me; don't bother me". This code is never used if the verbal meaning of the statement is interpreted as disapproving or humiliating. For example, mother asks where one of the child's friends lives; the child answers, "On 14th street" in a tone of

voice that tends to cut off further communication.

TA (TALK): This code is used if none of the other verbal codes are applicable. This code is not to be used in cases where talk is part of the ongoing activity required in PL or WK. (Note that this rule was not adhered to in the present study, with PL and WK being used as second order behaviour codes and TA being used as a first order code.) Thus in a game where one family member says, "It's your turn", that is not to be coded as TA but simply as PL. Likewise, in a work situation when one member of a dishwashing team says, "Here are some more dishes", the proper code is WK and not TA. However, any verbal behaviours other than TA are to be coded in WK and PL situations, i.e. HU, CM, CN, NC, DI, TE, YE, CR, LA, WH, and AP; since they are not second order, then they shall be double coded.

WH (WHINE): Use this category when a person states something in a slurring, nasal, high-pitched, falsetto voice. The content of the statement can be of an approving, disapproving, or neutral quality; the main element is the voice quality.

YE (YELL): This category is to be used whenever the person shouts, yells, or talks loudly. The sound must be intense enough that if carried on for a sufficient time, it would be extremely unpleasant.

Non-Verbal Behaviours of the First Order

DS (DESTRUCTIVENESS): Use of this category is applicable to those behaviours by which the person destroys, damages, or attempts to damage any object; attacks on people are covered by PN. The damage need not actually occur, but the potential for damage must exist, e.g. the child starts to throw a glass, but is stopped by the father. The value of the object is of no consideration nor is the actual amount of damage done.

HR (HIGH RATE): This category is applicable to any behaviour not covered by other categories that if carried on for a long period of time would be aversive, e.g. running back and forth in the living room, jumping up and down on the floor, "rough housing". If the behaviours can be covered by other categories, e.g. YE, PN, DS, then HR is not to be used. It may happen that in a sequence of behaviours, e.g., the children are playing leap frog in the house and at times one of them gives out with a scream; the code would be the following: 1HR 4HR 1YE 4HR 1HR 4HR 1YE etc.[2]

IG (IGNORE): Use this category when person A has directed behaviour at person B and person B appears to have recognized that the behaviour was directed at him,

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2. This type of sequential coding was not used in the present study. Instead a behaviour code was assigned to each of the six behaviour categories (Fm, Fc, Mf, Mc, Cf, Cm) for each time interval.

but does not respond in an active fashion. For example, mother is preparing dinner and the child comes into the kitchen and asks, "Can I help set the table . The mother looks at the child and then turns away to continue her work without having responded. In this case it is quite clear that the mother heard the behaviour directed to her, and that her response to the behaviour was to ignore it. However, the observer must be certain that the mother did hear the child before the code IG is appropriate. In those cases where there is doubt whether the person knows that the behaviour has been directed at him the appropriate code to use is NR (No Response) whose definition is explained in a forthcoming section.

PN (PHYSICAL NEGATIVE): Used whenever a subject physically attacks or attempts to attack another person. The attack must be of sufficient intensity to potentially inflict pain, e.g. biting, kicking, slapping, hitting, spanking, and taking an object roughly from another person. The circumstances surrounding the act need not concern the observer, only the potential of inflicting pain. For example, children may be playing and part of the game involves wrestling. If during the wrestling, one child hits the other child or pins him down to the point where pain could result, then the act of hitting or pinning down should be coded PN.

PP (PHYSICAL POSITIVE): Use this category whenever a

person touches another person in a friendly or affectionate manner, e.g. hug, pat, kiss, arm around shoulders, holding hands, ruffling hair, etc.

First Order Behaviours that may be Verbal or Non-Verbal

AP (APPROVAL): Used whenever a person gives clear gestural or verbal approval to another individual. Approval is more than attention, in that approval must include some clear indication of positive interest or involvement. Examples of approval are smiles, head nods, phrases such as, "That's a good boy", "Thank you", and "That's right".

CO (COMPLIANCE): Use this category when a person does what is asked of him in a CM, CN, or DP. Remember compliance need not follow the previously mentioned behaviours immediately, as other behavioural sequences can intervene.

DI (DISAPPROVAL): Use this category whenever the person gives verbal or gestural disapproval of another person's behaviour or characteristics. Shaking the head or finger are examples of gestural disapproval. "I do not like that dress", "Your didn't pick up your clothes again this morning", "You're eating too fast", are examples of verbal disapproval. In verbal statements it is essential that the content of the statement explicitly states disapproval of the subject's behaviours or attributes,

e.g. looks, clothes, possessions, etc. DI can be coded simultaneously with CM, but never with CN, as CN always implies disapproval.[3]

DP (DEPENDENCY): Behaviour is coded DP when person A is requesting assistance in doing a task that he is capable of doing himself. For example, mother is reading the newspaper in the evening and a child who is in junior high school requests her to look up a word in the dictionary; or a child, age 10, asks his mother to tie his shoes. Everyday requests should not be coded as DP; they must meet two criteria: that the person is capable of doing the act himself and it is an imposition on the other person to fulfill the request. For example, asking someone to pass the newspaper which is very close to the individual to whom the request is directed would not be considered DP, since the person would be able to hand the newspaper to the other individual without an undue amount of effort. If the paper were across the room from where the person is to whom the request has been made, and the person would have to move to get the paper, thus unduly interrupting whatever he were doing, then the request is coded DP.

IN (INDULGE): Behaviour is coded IN when a family member stops what he is doing in order to do some

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3. In the present study, no codes could be used simultaneously

behaviour for another person which that person is fully capable of doing for himself. Common kindnesses, e.g. pouring a cup of coffee for another while also pouring one's own, handing a nearby dictionary to someone who has asked how to spell a word, are not to be coded IN. IN takes a special effort (even when it is habitual) of the helping person to stop his own ongoing chain of behaviour and perform an unnecessary act for a capable person, without having been asked to do so. Note that when help is asked, the usual code is DP followed by CO or NC. Examples of IN include the following: 1) the family members are eating; only father is drinking coffee. Mother notices that his cup is empty, stops feeding the baby, gets up and refills his cup. 2) Mother takes off seven-year-old child's coat and washes his hands before dinner. 3) Mother cuts meat for child old enough to do this for himself. 4) Father does boy's arithmetic problems for him. Generally the consequence of IN is RC. Care must be taken to distinguish this category from DP and WK.

NC (NON-COMPLIANCE): This code is used when a person does not do what is requested of him by CM, CN, or DP. The non-compliance can be of a verbal or non-verbal nature. If the request is not to be complied with until some later time and the person says he will not comply. then the appropriate code is NC. Care must be taken to distinguish DI from NC. For example, mother tells

daughter to do the dishes; daughter says that mother is always making her work; daughter goes to the sink and begins to do the dishes; the proper coding is 3CM 4DI CO.

TE (TEASE): Use this category when a person is teasing another person in such a way that the other person is likely to show displeasure and disapproval or when the person being teased is trying to do some behaviour, but is unable to because of the teasing. For example, a child is tryng to do homework and another child keeps tickling him in the ribs or turns the pages of the book that the child is using for studying. Another example would be two parents teasing a young child by saying, "You're not my boy; go away from me", and when the child goes to the other parent, he hears the same remarks. This category should be distinguished from PL, LA, HU, and PN. Many cases of teasing will fall into the PL category.

Behaviours of the Second Order[4]

The following are lists of behaviours that should be considered by the observer as secondary in coding. If it is possible to code behaviours using the First Order Behaviours, the Second Order Codes should not be employed.

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4. Note that in the Patterson, Ray, Shaw & Cobb system (1969), PL and WK are first order behaviours while TA is a second order behaviour. In the present study, TA has been used as a first order behaviour, while PL (divided into PI and PS) and Wk have become second order.

Non-Verbal Second Order Codes

AT(ATTENTION): This category is to be used when one person listens to or looks at another person, and the categories AP or DI are not appropriate. Sometimes when listening is used as a reason for coding AT, it may may be difficult to tell if the person is listening. The situation will generally resolve the question, as the person who has been "listening" may make some comment and the content of the comment will indicate that he has been listening.

NO (NORMATIVE): Use this code when a person is behaving in an appropriate fashion and no other code is applicable. For example, the family is eating dinner, someone is reading the newspaper, or someone is walking from one room to another room.

NR (NO RESPONSE): This category is to be used when a person does not respond to another person. This category is applicable when a behaviour does not require a response, or when behaviour is directed at another person, but the person to whom the behaviour is directed fails to perceive the behaviour. There is a clear differentiation between NR and IG. IG is intentional non-responding and NR may be accidental, e.g. there could be a great deal of noise in the house so the person could not hear the behaviour to which a response is expected, or the person may be attending to something else in the environment,

e.g. mother may be feeding the baby when an older child comes in and asks a question. Whenenver behaviour is specifically directed toward another person and the person does not respond it is necessary to code either NR or IG.

RC (RECEIVE):Use this category when a person receives a physical object from another person or is touched by another person and does not do anything as a result of the contact. For example, mother combs daughter's hair, mother hugs baby, father puts his arm around son's shoulders. If the person responds in some way, then the response should be coded rather than RC, e.g. mother combs daughter's hair and daughter says, "That feels good"; this would be coded 3WK 4AP.

TH (TOUCH):This category is to be used when young children touch other people or hand an object to another person. Examples are a young child touching mother, small child passing blocks to other family members.

Verbal and Non-Verbal Second Order Codes

NA (NO ATTENTION)[5] : This code is to be used only when the individual's behaviour to another cannot be coded in any other way: to be used when the interactant is responding to one individual but not to the other. Unlike NR and IG in that there is no request that he respond. Use when no doubt whatsoever, otherwise code AT e.g. when

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5. This code was added for the present study.

the person's back is turned to one interactant.

PL (PLAY): This category is used when a person is playing either alone or with other persons. Play need not be restricted to games in which clear rules are defined, e.g. monopoly, scrabble, but is applicable to many activities from playing with a pet to playing with toys. This category is to be distinguished from WK or NO. This category is applicable whether the play is verbal or non-verbal, e.g. playing with a pet may involve no verbalisms and playing a card game may involve considerable conversation. For the purposes of the present study, PL was further divided into PI (PLAY INDIVIDUAL) which involved only one person in play, and PS (PLAY SOCIAL) which meant play with at least two people involved. "Noises" made during play are not to be coded separately, but conversation during play should be coded with the appropriate first order code e.g. TA, AP, DI, etc. Code the behaviour as PS rather than PI or AT if the interactants are engaged in the same play (e.g. all working on the same task) even though some may be more active than the others.

SS (SELF-STIMULATION): Use this category for behaviours which the individual does to himself and cannot be coded by any other codes. For instance, reading can be coded as NO if someone is reading the newspaper or WK if someone is reading a school assignment. But activities

like swinging a foot, humming, scratching oneself, rocking, etc. are coded SS.

WK (WORK): Use this category whenever a person is working, either alone or with other people. A clear distinction between work and play, WK and PL, is made by two rules: 1)the behaviour is necessary for the the smooth functioning of the household, and/or 2) the behaviour is necessary for a child to perform in order to learn behaviours that will help him assume an adult role. Examples of the first rule are mother doing the dishes or cooking, father doing the income taxes, son emptying the garbage, and daughter setting the table. Examples of the second rule are children doing homework, daughter combing younger sister's hair, son taking apart a carburetor, son tightening the wheels of his bicycle, and daughter learning to bake cookies. Whether the person enjoys the work is of no importance in coding the behaviour.

List of Coding Priorities

1. First order categories are given priority above second order categories.
2. TA becomes first order, but is to be coded only when other first order positive or negative behaviours cannot be coded. PL and WK become second order.
3. PL becomes PI (PLAY INDIVIDUAL) when there is only one person involved in play, and PS (PLAY SOCIAL) when there are at least two persons involved.
4. If two behaviours occur within a six-second interval, code the prosocial or deviant rather than the neutral.
5. If more than one of prosocial or deviant behaviours occur within one time interval, then code the one that best describes the interaction, or if that cannot be done, then code the one that occupies the most time, or if still not codable, then code the one that was initiated first.
6. Include NA in the coding system (to be used when responding differentially to the other two interactants). It is to be used as a second order code.
7. If TA occurs in conjunction with WK or NO, TA takes precedence.
8. If it is not clear to whom TA is directed, score to both other persons.

9. If there is a time interval where one of the members is missing or there is interaction with additional members, do not code that interval.

10. If the coder cannot hear well enough to distinguish between TA and other verbal codes, code TA.

11. When in doubt between CM and TA, code TA (including comments like "...one does...").

12. Compliance or noncompliance is only coded for one interval, during the interval in which it is initiated. If the behaviour that demonstrates the CO or NC continues over several intervals, then on succeeding intervals code the behaviour itself.

Appendix B

FORMATION OF THE CATEGORIES OF BEHAVIOUR CODES

Three categories of behaviour codes were used initially. These were the categories of "deviant", "neutral", and "positive", and were a composite of those categories used by Shaw (1971), Patterson (1971), and Wahl, Johnson, Johansson & Martin (1974). Because such a large proportion of the behaviours were coded as falling in the "neutral" category, this category was further subdivided into categories 2, 3, and 4 in the following manner. Both coders independently assigned behaviour codes to the categories, using the criterion for assignment to a category as the degree to which that behaviour facilitated positive social interaction. Comparison of the category compositions indicated disagreement on 5 behaviour codes (TA, DP, TH, WK, NO) with only one of these codes (TA) having a high frequency of occurrence. These disagreements were readily resolved through discussion, resulting in the five categories below.

Deviant		Neutral		Prosocial
1	2	3	4	5
CN	CR	AT	TA	LA
HU	NA	SS	CM	LA
NE	PI	PL	NO	PP
WH	NR	RC	WK	CO
YE	DP	TH	PS	IN
DS				
HR				
IG				
PN				
DI				
NC				
TE				

Appendix C

FORMULA FOR TESTING DIFFERENCE BETWEEN CORRELATIONS

The formula used for testing the significance of the difference between the multiple regression correlations of the same behaviour observed in the two settings* :

$$z = \frac{Z^1 - Z^2}{\sqrt{\frac{1}{N^1-3-9} + \frac{1}{N^2-3-9}}}$$

where z = the z statistic

Z^1 = the Fisher transformation of the correlation obtained in the laboratory

Z^2 = the Fisher transformation of the correlation obtained in the home

N^1-3-9 = the number of observations in the laboratory, with an additional nine degrees of freedom being lost for the additional nine predictors

N^2-3-9 = the number of observations in the home with an additional nine degrees of freedom being lost

m for the additional nine predictors

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*a modification of the formula presented in Glass & Stanley (1970) p. 308.