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The study of preschool children's peer relations has primarily employed sociometric interviews and observations of children's social participation during free-play situations as methods of assessment. These assessments of peer relations have traditionally demonstrated lack of fit between attitude (as measured by sociometry) and behavior (observation of social participation). Often, sociometric peer preference and acceptance does not correspond to children's observation of social participation during free-play. The present study was designed to improve this attitude-behavior fit by developing the Crystallized Sociometric Scales which employed post stratification of opinion responses.

Subjects consisted of 65 preschool children between three- to five- years-of age, divided into two preschool
groups of 45 and 20 subjects. Interviews on both the traditional sociometric scales and the crystallized sociometric (weighted with questions on peer exclusivity and friendship concept) were obtained. Observation of social participation used Parten's category of play with interval time sampling. Sociometric analyses of data provided a child by child picture of the social structure of the peer group. The discrepancy scores between social participation and the traditional and crystallized sociometric variables were compared using t-tests.

Results indicated that peer exclusivity provided the best attitude-behavior fit and was significantly better than the traditional nomination score. The level of the friendship concept did not affect the social participation of children. Crystallized ratings were not significantly different from the traditional ratings. The stability of the Crystallized Sociometric Scales was moderate, although it was significantly better than the traditional sociometric scales. It was concluded that crystallized sociometric nominations provide a methodology to improve the attitude-behavior fit. Although correlated, sociometry and social participation measure different aspects of peer relations whose relationship can be influenced by measurement procedures.
Attitude-Behavior Fit in Preschool Peer Relations: Configurations of Sociometry and Social Participation

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Chapter 1

INTRODUCTION

There are various uses of the sociometric technique in the domain of social science research. This technique can be used to study the dynamics of group structure (Moreno, 1934 & Newcomb & Bukowski, 1983), organizational administration (Criswell, 1960) and the process of group interaction. It has been used in the study of the working as well as the social environment. The use of sociometry has been particularly widespread in examining social relationships and the friendship structures of groups.

A considerable amount of the research on children's peer interactions has employed sociometry. It is often used as a pre-diagnostic test for the assessment of various social problems, (Asher and Gottman, 1981, Hartup 1978 and Rubin and Ross 1982), to select children for interventions, and for the measurement of children's progress in social development (Oden and Asher, 1977).
A consistent use of the sociometric technique with children has been for the assessment of attraction between individual members of a specified group (Asher and Hymel, 1981). Sociometry has been an important instrument in the measurement of social status, peer preference, group structure, friendship, and popularity among peers. Its use has been widespread in peer relations including popularity, isolation, acceptance, and rejection. A child's impact on peers has been determined by sociometric techniques and used as an index of social competence (Asher and Hymel, 1981).

Sociometric procedures, designed to measure children's social environment, traditionally have used two techniques to measure social status. Nominations are most often used to measure peer preference and are typically adapted from Marshall and McCandless' sociometric technique (1957). Rating scales (Roistacher, 1974; Singleton and Asher, 1977; Thomas and Powell, 1951) are most often used to measure peer acceptance.

Currently the most widely used social status classification systems are based on sociometric nominations (Newcomb and Bukowski, 1983; Coie and Dodge, 1983), wherein each child makes both positive and negative nominations by picking out peers they like to play with the most and the least, respectively. The nomination technique yields scores
which assess either popularity (positive nominations), or rejection (negative nominations), (Hymel, 1983).

Sociometric ratings assess individual differences in preschool social competence. Rubin and Daniels-Beirness (1983) found that over time ($r = .48$) from kindergarten to the first grade, the ratings were relatively stable. In this technique, children rate all of their classmates according to specified criteria. For preschool children this often involves the degree to which they like to 'play with' their classmates. The ratings range from a high of 'like to a lot', to a low of 'don't like to'. Each child is rated individually, and the ratings are independent of one another. Thus, the scale is best suited for the assessment of overall group acceptance (Schofield and Whitley Jr., 1983).

Even though sociometry has been used to study various aspects of peer relations, there are many questions about how well these measures represent behavior. Research findings report a minimal empirical relationship between sociometric scores and social participation scores of preschool and kindergarten children during free play situations (Howes, 1988; Marshall, 1957).

Howes (1988) studied the peer interactions of children one- to four-and-a-half years of age and reported that relations between observed behavior and standardized
sociometric rating were only moderately correlated. For four- to six-year-old children, sociometric scores correlated with the different categories of play as follows: .24 social, .48 complementary, .41 social pretend, and .44 cooperative. Ratings for both groups of three- and four-year-old children correlated with measures of easy entry and play. Relations between social status, friendship structure, and social participation classifications were also examined. Findings confirmed the independence of these three classification systems.

The above findings suggest that even though children state preferred playmates, when actually observed during free play situations, they may not interact with the nominees. The same is true regarding the degree of acceptance of each peer. The problem in attitude-behavior studies may arise from researchers substantial use of attitudinal measures based on the supposition that attitudes correlate substantially with the behaviors that are elicited with formal measurement procedures (Schuman & Johnson, 1976).

One reason for the discrepancy between observed interactions and sociometric measures could be a discursive attitude-behavior (A-B) fit (Mason et al, 1985). Mason's (1988) study also demonstrated that when any thought provoking opinion questions are asked, the inclusion of
'what' and 'why' open-ended questions help to distinguish between people who do and those who do not have any specified attitudes. In this manner, it is possible to distinguish people who are unable to give reasonable answers to the opinion questions. The results of this study indicated that there was a significant difference between the groups who had an attitude versus those who did not. It was also reported that when a choice is given and open ended questions are asked, the number of 'DK "shifters" '(don't know shifters) increases from 25% to 42%. This may be an indication of the restraints that individuals are under when they are forced to make a choice. The introduction of open-ended filter question helps to increase the attitude-behavior fit, separating people with specific attitudes from those that don't know.

Sociometric studies elicit attitudes on peer preference, acceptance, and friendship structures whereas the observations of social participation are measures of behavioral interactions. The assumed attitude - behavior fit between sociometric measures and social interaction has not been adequately substantiated in current literature. The current uses of sociometry do not take into account the degree to which children actually have clear attitudes about specific peers. Mason (1985) has distinguished between crystallized and fluid attitudes in his study on the
attitude - behavior fit. Crystallized attitudes correspond to behavior patterns better than fluid attitudes.

The use of the friendship concept enables a better understanding of the difference between fluid and crystallized attitudes. The level of friendship perceived by a subject for the nominees determines the friendship concept of the subject. The friendship concepts have been based on the friendship levels provided by Bigelow and LaGaipa (1977).

The concept of friendship is based upon liking, and requires the provision of shared support, and companionship. It is assumed that the higher the level of the friendship concept, the more crystallized the subject's attitude about friendship is likely to be. Therefore, by eliciting the friendship concept it would be possible to distinguish between children who have crystallized attitudes about friendship from those who still have fluid attitudes.

The existing sociometric techniques do not distinguish between the two kinds of attitudes. One way of resolving this issue is to better understand sociometry in relation to the nature of friendship among children.

Friendship structure may often be studied by the patterns of play observed. Parten (1932) has categorized the social participation of preschoolers into six categories which are consecutively of a higher order. These begin from
the simplicity of unoccupied behavior to cooperative play, which involves organized, and goal-directed play.

A delineation of children's concepts of friendship has been proposed by Berndt (1981). He asked children from kindergarten to the sixth grade some open-ended questions about friendship. The qualities that children seek in a friend vary with age. Also, children of all ages referred to friendship as involving play, and association, and thought that friends should behave prosocially with one another. Older children added intimacy, trust, and loyalty as criteria for friendship. Similar findings have been reported in other studies of friendship concepts (Bigelow, and LaGaipa, 1977, 1980; Youniss & Volpe, 1978). While children usually solicit each other because of their need for 'companionship, affection, and common amusement', there is variability in the degree to which these concepts characterize specific friendships (Damon, 1983).

Sociometric studies have been used to dichotomize 'friends', and 'non-friends' in a classroom situation by requiring each child to identify three to five friends, and classifying the rest of the peers in the class into a homogenous group of 'non-friends'(Bigelow & LaGaipa, 1980). As most of these studies were conducted in preschool situations, no differentiation was made between the degree of acquaintance of the 'non-friends' with that of the
child's friend. Assuming the degree of acquaintance to be the same for all members of a peer group rejects the existence of exclusivity in the friendship structure of the children in this age group. Therefore, even if the relationship between two friends were to be more exclusive than that of the others, preschoolers are thought to be incapable of that level of friendship.

In an interview study of 130 children between the ages of six and fourteen years, Youniss, and Volpe (1978) found that six and seven-year-old children claimed to be friends with people with whom they could share possessions and physical activities. Nine, and ten-year-old children spoke of friends as people who responded to one another's needs. Older children said that friends supported, comforted, and helped each other when the need arose. Thus, we see that the younger the child the greater the possibility of using rules for interpersonal interactions. On the other hand, older children will have a tendency to interact on the basis of the relationship they have with the person.

In determining friendship choices, many procedural variances of the sociometric scale are used. These may affect the same sample in different ways. Also depending on the sociometric procedure used for different samples, the results may indicate a different hierarchy of social
structure, and may even be measuring different aspects of the social structure.

Many sociometric tests require written or oral choices, or limiting the number of choices of friends allowed to each child. The sociometric test may also be administered individually or in a group. Thus, many discrepancies in the procedure for administering the sociometric nomination scale are found. Normally respondents are required to specify members within the group on the basis of selected criteria. This data is treated as binary, and the variable is the choice, or lack of it, of a peer in the group.

Often, multidimensional concepts like friendship are measured by questions like 'who do you like to play with?'. Children may answer the question differently depending on their age, and their concept of friendship (Hallinan, 1981).

The paradigm of children's peer relationship is founded on friendship. Even though there are various ways of conceptualizing children's friendship, the way that each child views friendship is not necessarily homogenous. Thus, although each child may have nominated an equal number of 'friends', each friendship may mean something different to each child. Hence we will have an erroneous picture of the social structure.
In addition to the attitude-behavior inconsistencies in sociometric research, the stability of sociometric scores also constitute a problem. In a review of sociometric studies of social competence, Asher, and Hymel (1981) reported that the reliability of the nomination sociometric technique varies with the age group being tested, and the time between test, and retest.

The validity of the sociometric instrument is also something to be considered (Hymel, 1983). Constraining the number of responses a respondent is allowed to give, may lead to the selection of members who do not satisfy the criterion but are chosen to comply with the required number of choices. On the other hand it may also lead to the exclusion of peers that do satisfy the criterion (Bigelow & LaGaipa, 1980).

Bigelow, and LaGaipa (1980) have discussed the problem with this type of dichotomizing, and say that it leads to somewhat inaccurate results. It has also been noted that if the ratings, and nominations are forced, and non-friends are chosen, a low reliability will result. To improve the attitude-behavior fit through post stratification of opinion responses (Mason et al, 1985), respondents were given the choice of a 'don't know' (DK) response. The inclusion of the 'DK' response is assumed to give more reliable results as
the respondents are not placed in a forced choice situation.

1.1. STATEMENT OF THE PROBLEM

There are some drawbacks in the traditional sociometric techniques. When these sociometric scales are examined, we find that different interpretations of the scales can be made. It is possible that we may be looking at different aspects of tapping social status. The rating technique (Roistacher, 1974; Singleton, and Asher, 1977; Thomas, and Powell. 1951) is used as an assessment in measuring group acceptance. The Picture Nomination Scale (McCandless & Marshall, 1957), on the other hand, is traditionally used to determine the popularity, and rejection of group members.

Traditional sociometric nominations are designed in a manner that may give an inaccurate picture of the social structure of the group. Inaccuracy can result from the nominations being forced choice. The subject is usually required to nominate a fixed number of peers in a decreasing degree of preference. This affects the results in two ways. First, nominations are made even though the nominees may not be significantly preferred peers. Secondly, peers may remain unnominated because there are only a fixed number of nominations to be made.
These factors do not reflect the true range of exclusivity of peer relationships. By allowing the subjects to have flexibility in the number of peers that they are allowed to nominate, a true picture of the nature of the social structure, and the degree of peer exclusivity can be obtained. Peer exclusivity in itself symbolizes the degree of preference that subjects allocate to nominated peers. Tacit is the implication that the lesser the number of peers nominated, the more exclusive the relationship.

Also, nominations fail to distinguish between people who have crystallized conceptions about peer relationships, versus those that have fluid attitudes. If researchers could provide a measure that separated children who have crystallized attitudes about friendship, from those who do not have a firm opinion, it would be possible to strengthen the measure in terms of its attitude-behavior fit.

The Crystallized sociometric nominations (CSN), and the Crystallized sociometric ratings (CSR) were developed with this factor in mind. In this study, the CSN, and CSR were used to identify the degree of exclusivity, and the friendship concepts as well as a means to enhance the confluence of sociometric, and social participation scores. Children with fluid attitudes were presumed to be unable to validate their friendship concepts, and be involved in less exclusive relationships.
The Crystallized Sociometric Rating scale is based on a technique developed by Mason et al, (1985), which improves the attitude - behavior fit through post stratification of opinion responses. As the respondents on the CSR are given the option of a "don't know" response, it is assumed that such a measure will provide more reliable results since the respondents are not in a forced choice situation.

Using Mason et al's (1985) archetype of the attitude - behavior fit in the Crystallized Sociometric Nomination scale, it would be possible to improve the association between sociometric scores (attitude), and naturalistic observation during free play (behavior), thus give greater integrity and efficiency to the sociometric scale.

The purpose of this study was to demonstrate that the method of forced nominations would not reflect a good attitude - behavior fit. This method constrains a subject to either give more choices than desired or give only a few of the actual friends due to the limitation imposed by the sociometric technique. The social participation scores are thus not representative of the elicited sociometric scores. The study was thus carried out to provide more predictive scales of sociometric measurement for preschoolers - the Crystallized Sociometric Nominations, and Ratings (CSN, and CSR).
The CSN is a modified version of the sociometric nomination scale developed by McCandless, and Marshall (1957). In the CSN scale questions on sociometric awareness have been added to distinguish between children who have specific preferences for friends versus those that who do not. Also, questions on friendship have been used as filters to ensure that the responses are valid. Children can, therefore, be divided into two groups, those who have an attitude, and those who 'don't know'. Additionally, CSN aimed to distinguish children by the exclusivity of their relationship. The more exclusive the relationship the less likely it was to reflect discrepancy with actual social participation.

The CSR is a modified version of the sociometric rating scales developed by (Roistacher, 1974; Singleton, and Asher, 1977; Thomas, and Powell, 1951). This scale provided the subjects with an option of not rating a peer by responding "don't know". Both the CSN, and CSR scales have been developed so that they provide a better fit to the attitude-behavior question, the measurement of social participation, peer acceptance, and popularity.
1.2. **HYPOTHESES**

The following hypotheses have been put forth for investigation in this study.

(a) Exclusivity of friendship will be a better reflector of social participation than the forced choice nominations using the traditional sociometric scale.

(b) The attitude-behavior fit will be better reflected by the level of the friendship concept that the subjects have. The higher the level of the friendship concept, the better the fit with the observed social participation.

(c) The revised ratings will be a better predictor of social participation than the traditional ratings.

1.3. **OPERATIONAL DEFINITIONS**

Terms that will be used throughout this study are defined as follows.

**Sociometry**: is the technique for the measurement of attraction, and social status between members of a peer group, and is used to measure peer preference, and peer acceptance.

**Preschool Children**: three- to five-year-old children enrolled at the Orchard Street Child Development Center in both the morning, and afternoon sessions.
Social Participation: this is the social interaction of three- to five-year-old-preschool children during free play situations. It uses the definition given by Parten (1933) using the categories of unoccupied behavior, onlooker, solitary independent play, parallel activity, associative play, and cooperative play (pp 249-251). It is involuntary, that is not organized by the teachers.

Peers: are the same-age, and same-sex preschool children. This criterion has been used because preschool children are typically found to interact more with same-rather than opposite-sex peers (Asher & Hymel, 1981).

Attitude - Behavior Fit: (A-B fit) is defined as the ability of an 'attitude to predict behavior', and 'involves measuring actual behavior objectively, and unobtrusively, without signalling in any way its connection to the prior or subsequent attitude assessment phase'. (Schuman & Johnson, 1976 pp. 65). For the present study, attitudes are measured by the Sociometric Scales, and behavior is measured by observing the social participation of preschool children during free play. Time sampling technique will be used employing Parten's (1933) categories of play.

Peer Exclusivity: is defined as the degree of preference that a subject allocates to a nominated peer. It is reflected as a percentage of one. Depending on the number of peers nominated, the score for each nominee would vary -
the lesser the nominees the more exclusive the relationship, and vice-versa.

**Friendship Concept**: is defined as the level of friendship perceived by the subject of the nominated peer. This is based on the levels given by Bigelow, and LaGaipa (1977).

**Crystallized Friendship**: this is a variable derived by weighting peer exclusivity with the friendship concept, thus determining the degree of exclusivity.

**Sociometric Nominations**: is a technique which determines the degree of popularity (McCandless & Marshall, 1957) of the children in a group by eliciting two responses on specified criteria such as 'like to play with'. This is a measure of peer preference. It is also referred to as "forced choice" during the course of the study.

**Sociometric Ratings**: (Roistacher, 1974, & Singleton, and Asher, 1977, & Schofield & Whitley Jr., 1983) is a technique for assessing the status of each member within a peer group, and is based on the five-point Likert rating conferred by all members of the group to each member of the group. This is a measure of peer acceptance.

**Crystallized Sociometric Nominations**: is a technique developed to give a better attitude - behavior fit when compared to the traditional sociometric measures, by allowing an open-ended number of peer nominations. It
determines the degree of popularity of children in a group as well as distinguishes between children who have crystallized attitudes about friendship versus those who don't (Mason et. al., 1985)

**Crystallized Sociometric Ratings**: is a measure of peer acceptance, and is similar to the technique developed by Roistacher (1974), Singleton and Asher (1977), with the addition of an option of responding 'don't know' (Mason et. al., 1985) and removing the neutral face from the scale.
Chapter 2

LITERATURE REVIEW

There has been extensive use of sociometry in the research environs of the social sciences. Sociometry has been used to facilitate work efficiency in the corporate world, to understand organizational administration (Criswell, 1960), to study the dynamics of group structure (Moreno, 1934), and the process of group interaction (Asher & Hymel, 1981; Hymel, 1983; and Newcomb & Bukowski, 1983). Sociometry is an experimental technique which assesses the 'evolution and organization of groups and the position of individuals within them' (Moreno, 1953).

Sociometric studies have been carried out to measure social participation, group structure (Brownell, 1990; Bukowski & Newcomb, 1984; Dorien, 1986.), to ascertain the process of group interaction and friendship (Andrews et. al., 1991; Beck et al., 1984; Bigelow & LaGaipa, 1979; Dishion et.al., 1991; Furman & Bierman, 1983; Hymel et.al., 1989; and Oden & Asher, 1977.), and popularity among peers (Marshall, 1957; Masters & Furman, 1981). Its use has been wide-spread. Sociometry has been used with children of all ages beginning from the time that they are toddlers (Brownell, 1990). Researchers have used it to determine
social competence in peer relations including popularity, isolation, acceptance and rejection (Rubin et. al., 1989). A child's impact on others has been determined by sociometric techniques, and used as an index of social competence (Asher and Hymel, 1981).

Among the many utilizations of sociometry, it has been used as a prediagnostic test for the assessment of various problems, identifying neglected and rejected children (Asher and Gottman 1981, Hartup 1978 and Rubin and Ross 1982), and determining peer status to select children for interventions and later assessment of their progress (Oden and Asher, 1977).

2.1. ATTITUDES, BEHAVIOR, AND SOCIOMETRY

Sociometry has been defined as a process used to elicit 'data about interpersonal choices, especially friendship choices about group members' (Hallihan, 1981, pp. 91.). It is a research methodology which asks 'respondents to identify those group members who satisfy a preference criterion'. Research studies in which sociometric questionnaires are analyzed are often called sociometric studies.

A similar definition has been provided by Green (1954), who identified attitude research as involving 'elicited
verbal attitudes'. These are responses to questionnaires, interviews and other direct measurement procedures. The measurement of attitudes regarding peer preference, social participation or group structure is, therefore, essentially a sociometric process.

When we talk about behavior, it is generally an action, and may be everything done by an individual (Schuman & Johnson, 1976). Thus, behavior can be defined as observable peer interactions, and attitudes as elicited responses of peer preference and knowledge of interaction. Having established, through definition, that sociometry is a form of attitude research; we encounter problems associated with attitude - behavior research. The main problem arises from the fact that the researchers make substantial use of attitudinal measures based on the supposition that attitudes correlate significantly with behaviors that are elicited with formal measurement procedures (Schuman & Johnson, 1976).

A study of peer interaction of children one- to four-and-a- half years of age (Howes, 1988), reported that relations between observed behavior and standardized sociometric rating were moderately correlated (r = .40 for sample 1, N = 35 and r = .38 for sample 2, N = 153). For one-hundred-and-ninety-six four- to six-year-old children, sociometric scores were positively correlated with social
participation, assessed using the different categories of play such as, social (.24), complementary (.48), social pretend (.41), and cooperative (.44). Ratings for both groups of three- and four-year-old children correlated with measures of easy entry (.34 and .66) and play (.39, .49, .51, and .52, for social, complementary, social pretend, and cooperative respectively). Relations between social status, friendship, and social participation classifications were also examined. Findings confirmed the independence of the three classification systems. In addition, children with mutual friends were engaged in more cooperative and social pretend play (.75) than children who had no mutual friends (.42).

2.2. FRIENDSHIP AND SOCIOMETRY

Another use of sociometric studies has been to dichotomize 'friends' and 'non-friends' in a classroom situation by requiring each child to identify three to five friends, and classifying the rest of the peers in the class into a homogenous group of 'non-friends'. Bigelow and Lagaipa (1980) have discussed the problem with this type of dichotomizing, leading to somewhat inaccurate results. As most studies are conducted in preschool situations, no differentiation is made between the degree of acquaintance
of the 'non-friends' with that of the child. Hence, an erroneous picture of the social structure may emerge.

The prototype of children's peer relationship is founded on friendship. The qualities that children seek in a friend vary with age. Research has shown that children usually solicit each other because of their need for 'companionship, affection, and common amusement' (Damon, 1983). It is also known that the more familiar the peer is to a child, the greater the social participation and higher the level of play (Doyle, Connolly & Rivest, 1980) among them.

The concept of friendship is based upon liking and requires the provision of shared support and companionship. Bigelow (1977) has identified three stages of friendship that children go through. In the first stage, friendship is seen as influenced by propinquity, either geographical or physical, and lasts through the early elementary school years. It is manifested in common activities between peers who like each other. An ideal friend is one who is useful and a source of pleasure, someone who is accessible and joins the child in play. During the second stage, children expect friends to admire each other and do so over a period of time. Here they have entered a normative stage and rules become important. Children in this stage believe that children help each other. The third stage of friendship
originates toward the end of childhood and encompasses mutual acceptance, loyalty and commitment, genuineness, common interests and a potential for intimacy.

An analogous delineation of children's friendship has been proposed by Berndt (1981) and Berndt and Perry (1986). He asked children from kindergarten to the sixth grade open-ended questions about friendship. The subjects were asked to nominate their best friends, and to rate them on the degree of liking. Children who needed help with the questionnaire were provided it. The best friend nominations and ratings were used to identify friends. These friends were then asked questions about friendship. Each response was coded into one of eight categories devised by Berndt (1981). It was seen that children of all ages referred to friendship as involving play and association, and that friends behave prosocially with one another. Older children were found to give intimacy, trust, and loyalty as criteria of friendship. However, Berndt's study indicated that although there were eight levels, higher levels did not exclude the presence of lower categories of friendship in them.

A study examining the development of friendship conceptions among four- to seven-year-old children (Furman and Bierman, 1983) administered an interview, a picture recognition task, and a forced choice rating task in which the children were required to identify the most important
characteristics for friendship. Here, a majority of the children reported common activities, affection and support. A large number of children also mentioned propinquity. The same attributes emerged on the picture recognition task. In the forced choice rating task, children preferred common activities and affection. On each of the three tasks, older children reported affection and prosocial support more than common activities and physical characteristics.

Similarly, Selman (1980) has proposed that preschool friendships are unstable because they are based on physical characteristics or transitory play. He conducted clinical interviews, providing dilemmas to the subjects. These were designed to elicit children's understanding of friendship development. Research indicated that friendship was developmental in nature, being transitory when they were young and becoming more stable with age. Therefore, as children become aware of thoughts, feelings and the reasons underlying friendly behavior, the notion of a stable friendship relation may emerge.

Interviewing 130 children between the ages of six- and fourteen-years (Youniss and Volpe, 1978), found that six- and seven-year-old children claimed to be friends with people with whom they could share possessions and physical activities. Nine- and ten- year-old children spoke of friends as people who respond to one another's needs. Older
children said that friends supported, comforted, and helped each other when the need arose.

Thus, the younger the child the greater the possibility of using rules for interpersonal interactions. The older children, on the other hand will have a tendency to interact on the basis of the relationship they have with the person along with the use of rules.

2.3. **SOCIOMETRY AND SOCIAL PARTICIPATION**

Much of sociometric data exhibits evidence of a sex bias. Children have demonstrated a preference for members of the same sex, but different race rather than same race and different sex (Criswell, 1939). Other studies have also reported acceptance of same-sex and rejection of opposite-sex children (Asher, 1973; Singleton, 1974). Observing playground interaction of preschool, first, and second grade children, Omark and Edelman (1973, reported in Asher et al, 1977 pp. 40.) found that children essentially played with same-sex peers.

One of the important uses of the sociometric technique entails the determination of peer relationships, status of group members, and friendship structures. These may often be studied by the patterns of play that the children evolve when in free play situations. Parten (1932) has categorized
the social participation of preschoolers into six categories
which are consecutively of a higher order. These begin from
the simplicity of unoccupied behavior, to onlooker, solitary
play, parallel play, associative play and lastly, cooperative play, which involves organized and goal directed
play.

Observing the development of sociometric status among
second grade boys over a period of time (Dodge, 1983), 48
unacquainted boys were assembled into six play groups of
eight boys each. These groups met for eight one-hour
sessions. Free play interactions were recorded. At the end
of the eight sessions, sociometric interviews were obtained
for each child and the children were classified into
popular, rejected, neglected, controversial, and average
boys. Questions about categories of behavior were asked and
children were classified into the following four categories,
aggressive, shy, leader, and shares. The results indicated
that depending on the appropriateness of their behavior they
were rejected or accepted.

Marshall and McCandless (1957) have found that the
frequency of associative and cooperative play is positively
related to peer acceptance. In all categories of a friendly
nature in spontaneous play, degree of a child's participation is positively related to his or her sociometric score and to the teacher's judgement of social
acceptance. It was also found that hostile play interactions do not have any relation to the child's sociometric score, although it may be positively related to the teacher judgement scores.

Studying the sociometric awareness, social participation, and perceived popularity in preschool children, Krantz (1982) evaluated 47 children on sociometric popularity and observations of social participation, along with referential communication and an emotion-attribution task. A sociometric awareness procedure was devised to assess the child's ability to illustrate the sociometric scores of their same-sex peers. Results indicated that children who were relatively high in social participation were more aware of the friendship patterns of their peers and were also perceived as more popular by their peers. Social participation, sociometric awareness and perceived popularity were all significantly related to each other. Conventional popularity scores did not show any relationship to sociometric awareness even though conventional popularity and referential communication were highly correlated.

Deutsch (1974) studied 60 middle-class preschool girls from two nursery schools. Two sociometric nominations were elicited and each subject was observed during ten, five-minute intervals over three weeks. A communicative egocentrism task was also administered. It was assumed that
the higher the score on the communicative egocentrism task, the lower the degree of egocentricity. Findings reported that although the observational measure was related to the communicative egocentrism ($r = .52$, $p < .01$), sociometric scores were not ($r = .22$ ns). Thus, the female preschoolers' choice of playmate in the sociometric nomination measure was not the same as the children they actually played with. The observational measure was not related to the sociometric measure ($r = .09$ ns).

2.4. ATTRACTION STUDIES IN SOCIOMETRY

Sociometric techniques can be defined as 'measures of interpersonal attraction among members of a specified group' (Hymel, 1983 pp. 237). They focus on the understanding and measurement of social structures, and hierarchies within groups of people (Asher and Hymel, 1981). Over the last twenty years sociometric techniques have been the primary instrument for the assessment of peer relations among children.

Studying the sociometric stability and friendship choice consistency, 334 fifth grade children (Bukowski and Newcomb, 1984) from five elementary schools were asked to nominate three best friends and three disliked same-sexed peers. These data were collected over a period of 18 months,
with a one month difference between two data sets and a gap of six months. Results indicated that both sociometric stability and friendship consistency of received choices were more stable over short intervals (one month, $r > .5$, $< .7$) than over long intervals (six months or more $r > .4$, corrected $r = .63$). There was considerable consistency in the choice of liked peers ($F(1,254) = 152.4$, $p < .001$, $M = .38$) than disliked peers ($M = .12$).

Observing the social interaction of 94 preschool children after sociometrically identifying them as liked or disliked, the rate of the subjects' receiving or giving reinforcements was studied (Masters & Furman, 1981). Results indicated that children were significantly more likely to dispense both reinforcement and neutral behavior to friends rather than generally to all members of the peer group. The social status of a child was associated to over all rates of receiving and dispensing reinforcements and neutral acts. For the selection of specific friends, it was found that the personal interaction between the subject and the friend was important.

Rubin and Daniels-Beirness (1983), studied 72 five-year-old children, for a period of a year. The subjects were tested at the beginning of the study and then a year later. Sociometric nominations, ratings, social problem solving and social competence were assessed, the subjects were also
observed during free play. It was reported that at both Kindergarten and Grade 1, positive peer interactions were correlated with social status. Social status was negatively correlated with "rough and tumble play" (Rubin et al. 1981, pp 345) and solitary play, and positively correlated to the frequency of parallel constructive play (F (1,53) = 4.15, p<.05), constructive play, and social problem solving skills (F (1,52) = 4.77, p <.05).

A common feature of studies on in-group and out-group peer preferences is the use of the traditional sociometric peer nomination scale to measure peer preferences. Such a procedure severely restricts the number of 'others' a child can choose and generally results in the nomination of few very close friends. It is possible that because of the limited choice only in-group members are nominated because the out-group members are not that close (Schofield and Whitley Jr., 1983).

In determining friendship choices many procedural variations of the sociometric scales are used. These may affect individual samples in different ways. Many sociometric tests require written or oral choices, or limiting the number of choices of friends allowed to each child. The sociometric test may also be administered individually or in a group. We thus find many discrepancies
in the procedures for administering the sociometric nomination scale.

The reason that the sociometric scale has been increasingly used for the assessment of peer relations is the benefit it has over other measures used for the same purpose. The sociometric technique provides a means to obtain information on a large number of children in a relatively short period of time (Asher & Hymel, 1981). This technique also allows peers themselves to evaluate each other and the group, thus eliminating adult biases.

Various types of sociometric measures have been developed. All are designed to measure the extent to which children/adults are liked or disliked by their peers. The two major methods of sociometric assessment in peer attraction studies are the nomination and the rating scales.

2.5. SOCIOMETRIC NOMINATIONS

The peer nomination scale was first developed by Moreno (1934). Over the course of time, many variations of the scale have been developed (McCandless & Marshall, 1957 and Asher et al., 1979). When using the sociometric nomination measure, children are asked to make a specified number of nominations according to predesignated criteria; (eg. 'whom would you like to play with', 'be a best friend to', or some other interpersonal dimension).
Depending on the sociometric criteria used, acceptance or rejection scores are obtained. Positive nominations yield popularity score whereas negative nominations yield the rejection scores. The total score for each individual is equal to the number of nominations obtained (both positive and negative). Usually only same-sex peers are used for the selection of both positive and negative status nominees, since young children have been found to show a marked preference for same-sex peers (Asher and Hymel, 1981). Entry behaviors are also related to the sociometric status of preschool children (Dodge, 1983; Dodge et. al., 1983; Howes, 1988; Putallaz and Gottman, 1981).

Sociometric studies assessing individual differences in social competence among preschool children (Asher et al, 1979, Hymel 1983) are based on their knowledge of their peer group. In order to have a reliable measure of sociometric nominations, the child is expected to have knowledge of the members of the group, their behavioral characteristics and also be capable of making stable judgments about those characteristics. Individual differences in social status are found to be associated with concurrent social competence in preschool and older children (Coie and Dodge, 1983; Dodge et. al., 1983; Hartup, 1983).

Peer nomination techniques are often used to identify children experiencing social difficulties. Rubin and his
colleagues (1983) studied 81 eight-year-old children. Sociometric nominations, both positive and negative and ratings were obtained. Peer assessments of social behavior and social self perceptions were obtained. Social participation with three same-sex peers was recorded. Findings indicated that rejected children were significantly less liked than all the other groups, and were most likely to play alone. Neglected children were similar to the popular and average children in most factors, except, during social play they were more likely to be involved in solitary play. The study indicates that rejected children are more at risk than neglected children.

The most widely used social status classification systems are based on sociometric nominations (Newcomb and Bukowski, 1983; Coie and Dodge, 1983). However, this technique has been criticized when used with preschoolers for their relatively low reliability. In a critique of sociometric studies, Hymel (1983) has reported studies which tend to indicate a high concurrent validity for the nomination measure. She has stated that preschool children's nomination scores are related to social participation scores and (Furman & Masters, 1980; Rubin & Hayvren, 1981 and McCandless and Marshall, 1957), to various social cognitive abilities (Rubin, 1972), and to teacher ratings (Connolly & Doyle, 1981).
In a review of sociometric studies of social competence, Asher and Hymel (1981) report that the reliability of the nomination sociometric technique varies with the age group being tested, and the time between test and retest. The older the children, the higher the test-retest reliability. Bonney (1943) examined the test retest reliability of positive nominations among elementary school-age children. Here, over a period of one year the reliability of sociometric scores was found to correspond to those of children's achievement scores.

Rubin et al (1981) looked at the stability of the sociometric scores of children from kindergarten to the first grades. They found that the sociometric scores for the two classes were significantly correlated ($r = .48$, $p < .001$).

Another study of sociometric correlations reported a reliability of .76 and .84 for fourth and sixth grades, respectively (Busk, Ford, and Schulman, 1973). These tests were administered eight weeks apart and looked into sociometric rank based on nomination scores. Roff et al. (1972) looked into the stability of positive nomination scores for elementary school children over a period of two years. The reliability was .52 over a period of one year and .42 for two years. The test-retest reliability for negative
nomination scores was even lower, .38 and .34 for one and two years, respectively.

Although the reliability for positive nominations is somewhat stable for elementary and older children, it is only moderate for preschoolers. To augment the sociometric measure for preschool children, McCandless and Marshall (1957a) developed a picture nomination technique so that children could point to the pictures of their classmates when responding to the sociometric questions. However, even with the new technique the reliabilities obtained for preschool children were much lower than those obtained for older children (McCandless and Marshall, 1957, Hartup et al., 1967).

2.6. **SOCIOMETRIC RATINGS**

The rating scale (Roistacher, 1974, Singleton and Asher, 1977, Thompson and Powell, 1951) is a different type of sociometric procedure. In this technique, children rate all their classmates according to specified criteria. Use of the rating scale with children in elementary school has been done asking how much they like to 'play with' or 'work with' each member of their class (Hymel and Asher, 1977; Oden and Asher, 1977; Singleton and Asher, 1977). The ratings range from high, that is, 'like to a lot', to low that is, 'don't like to'. The average of all ratings received is the score
obtained for each child. Faces with gradations of a smile and a frown are used to help the child to understand the rating scheme.

Various studies have used the rating scale as a measure of acceptance. Sociometric ratings assess individual differences in preschool social competence, and have shown to be relatively stable \( r = .48, p < .001 \) (Rubin and Daniels-Beirness, 1983) in kindergarten to the first grade children.

Rubin and Daniels-Beirness (1983), studied the concurrent and predictive correlates of sociometric status of 72 kindergarten children over a year. The children were studied through the first grade, and were assessed for social problem solving, social competence, sociometric status (ratings, popularity and rejection), and social participation during free play. The second set of tests were administered exactly a year after the first set. Findings indicated that positive interactions positively correlated \( r = .31, p < .005 \) with sociometric status for the kindergarten children, and was barely correlated \( .04 \) ns in first grade children. Problem solving skills were significantly related to the ratings for grade 1 \( r = .38, p < .001 \).

A study of peer interaction of children one- to four-and-a-half-years of age (Howes, 1988), reported that
relations between observed behavior and standardized sociometric rating were moderately correlated. Ratings for both groups of three-and four-year-olds correlated with measures of easy entry and play. The rating scale provides a more reliable index of peer relations than the nomination technique as there are a larger number of observations from which the score is derived. A higher test-retest reliability is obtained using the rating scale than the nomination scale in preschool age children (Asher et al., 1979).

Measuring the test-retest correlation in two preschools over a four-week period (Asher et al., 1979), it was found that the rating measure yielded a higher correlation (.81, and .74) than positive nominations (.56, and .38) or negative nominations (.42 for only one preschool). Therefore, it was concluded that the rating scale measure was more reliable than both the positive and negative nomination measures. Asher et. al. (1979), have specially designed the picture rating scale for preschoolers which takes care of the test-retest reliability problem.

2.7. PROBLEMS WITH THE TRADITIONAL SOCIOMETRIC TECHNIQUE

The traditional sociometric technique has many disadvantages and weaknesses. Normally respondents are required to specify members within the group on the basis of
selected criteria. These criteria vary with the age group of the subjects being studied and could vary from "who do you like to 'play' with the most" to "who do you like to 'work' with the most.

This data are treated as binary and the variable is the choice, or lack of it, of a peer in the group. Often, multidimensional concepts like friendship are measured by questions like 'who do you like to play with?'. Children may answer the question differently (Hallinan, 1981).

The degree of effectiveness of the sociometric instrument is to be interpreted carefully. Constraining the number of peers a subject is allowed to nominate may lead to the selection of members who do not satisfy the criterion, but are chosen to give the required number of choices. On the other hand, it may lead to the exclusion of peers that satisfy the criterion (Bigelow and LaGaipa, 1980).

Whereas sociometry has been employed to study various aspects of peer relations, many questions about how well these measures represent behaviors are asked. Research findings report that there is a lack of an acceptable empirical relationship between sociometric scores and social participation scores, of preschool and kindergarten children during free play situations (Marshall, 1957). The current uses of sociometry do not take into account the degree to which children actually have clear attitudes about specific
peers. This suggests that even though children say that they would prefer to play with specified peers, when actually observed during free play situations, they are not interacting with the nominees. The same is true regarding the degree of acceptance of each peer.

The problem in attitude-behavior studies arises from the fact that researchers make considerable use of sociometric measures based on the assumption that attitudes correlate substantially with observed behaviors that are elicited with formal measurement procedures (Schuman & Johnson, 1976).

Sociometric studies elicit attitudes of peers on peer preference, acceptance, and friendship structures whereas, the observations of social participation are measures of behavior.

An attitudinal measure has been developed to improve the attitude-behavior fit through post stratification of opinion responses (Mason et al, 1985). Here 251 farmers were required to answer an hour long face-to-face interview, regarding soil erosion control practices. As all the farmers were faced with varying degrees of soil erosion, from severe to minimal, their responses to the questions was expected to be diverse. It was found that when any thought provoking opinion questions were asked, the inclusion of 'what' and 'why' open-ended questions helped to distinguish between
people who do and those who do not have any specified attitudes. Thus, it enabled researchers to distinguish people who are unable to give reasonable answers to the opinion questions.

Respondents were given the choice of a 'don't know' (DK) response. It was found that having the choice of not giving a definite answer improved the attitude-behavior fit. This may be an indication of the restraints that an individual is under when forced to make a choice. The introduction of open-ended filter question helps to increase the attitude behavior fit, separating people with specific attitudes from those that don't know.

The results indicated that there was a significant difference between the groups who had an attitude from those who did not. It was also reported that when a choice is given and open ended questions are asked then, the number of 'DK "shifters"' increases from twenty five to forty two percent.

Mason (1985) also distinguished between crystallized and fluid attitudes in his study on the attitude - behavior fit. Crystallized attitudes correspond to behavior patterns better than fluid attitudes. The existing sociometric techniques do not distinguish between the two kinds of attitudes.
In addition to the attitude-behavior inconsistencies in sociometric research, the stability of sociometric scores also constitute a problem. In a review of sociometric studies of social competence, Asher and Hymel (1981) reported that the reliability of the nomination sociometric technique varies with the age group being tested and the time between test and retest.

The Crystallized Sociometric Scales, (that is, the Crystallized Sociometric Nominations and the Crystallized Sociometric Ratings) were developed to improve the A - B fit. Using Mason et al's (1985) paradigm of the attitude - behavior fit in the modified sociometric scales, it would be possible to ameliorate the association between sociometric scores (attitude) and naturalistic observation during free play (behavior), thus giving greater integrity and efficiency to the sociometric scale.

The present study has been carried out to provide a more efficient scale of sociometric measurement of preschoolers - the Crystallized Sociometric Nomination and Rating Scales (CSN and CSR) . By adding questions on sociometric awareness, eliciting friendship concepts of peers and determining the degree of exclusivity of peer relationships, it attempts to distinguish between children who have specific preferences for friends versus those that who do not.
ATTITUDE-BEHAVIOR FIT IN SOCIAL DEVELOPMENT
3.1. **SAMPLE I**

The first sample consisted of 48 children from the two preschool programs of the Orchard Street Child Development Center. This is an experimental laboratory preschool affiliated with the Department of Human Development and Family Sciences, at Oregon State University. Hence, parents were aware that research was being carried out at the school. Parental consent for conducting research was obtained (see Appendix II).

The preschools operated in morning and afternoon sessions, with separate kids in each session. There were a total of 23 girls and 25 boys attending the preschool. (See Table I) The morning session had 13 girls and 12 boys and the afternoon session had 10 girls and 13 boys. The children ranged in age from 43 to 68 months.

There was an ethnically mixed group of children in the sample, 32 White, three Hispanic, and seven Asian. Forty seven children come from intact families. One child was from a single parent family. Three girls had to be removed from the sample. Two had to leave school before the research
was completed, so complete data on them was not available. The third child changed school sessions, hence, the data became invalid as far as peer familiarity was concerned.

Table 1. Sex and ages of subjects in Sample I

<table>
<thead>
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<th>Gender</th>
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<tbody>
<tr>
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<td>55.56</td>
<td>---</td>
</tr>
<tr>
<td>girls</td>
<td>20</td>
<td>44.45</td>
<td>---</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>boys</td>
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<td>---</td>
<td>54.8</td>
</tr>
<tr>
<td>girls</td>
<td>44 to 66 months</td>
<td>---</td>
<td>54.5</td>
</tr>
</tbody>
</table>

3.2. SAMPLE II

The second sample, was used to gather data a year later, consisted of all 20 children from the preschool program of the Park Terrace Child Development Center. This is a second experimental laboratory preschool affiliated with the Department of Human Development and Family Sciences, at Oregon State University. Hence, parents at this facility were also aware that research was being carried out at the school. Parental consent for conducting research was obtained. (See Appendix III).
There were a total of ten girls and ten boys attending the morning preschool program. The children ranged in age from 38 to 61 months. (See table 2.).

Table 2. Sex and ages of subjects in sample II

<table>
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</thead>
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<td></td>
</tr>
<tr>
<td>girls</td>
<td>10</td>
<td>50.00</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th></th>
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<tbody>
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<td>boys</td>
<td>44 to 60 months</td>
<td>52.8</td>
</tr>
<tr>
<td>girls</td>
<td>38 to 61 months</td>
<td>49.0</td>
</tr>
</tbody>
</table>

3.3. DESIGN

Observational and sociometric procedures were used in assessing all of the sample. These included,
(i) Parten's (1932) social participation categories using interval time sampling, based upon naturalistic observations of children during free play,
(ii) Sociometric Ratings (Roistacher, 1974; Singleton and Asher, 1977; Thomas and Powell. 1951), assessing peer acceptance,
(iii) the Sociometric Nominations (McCandless & Marshall, 1957), assessing peer preference,
(iv) the Crystallized Sociometric Ratings (CSR), assessing crystallized peer acceptance, and
(v) the Crystallized Sociometric Nominations (CSN), assessing crystallized peer preference by distinguishing between people who have crystallized attitudes versus those that have fluid attitudes.

The purpose of the study was to develop and evaluate the sociometric scales as efficient measures of peer interactions and group status. It aimed to distinguish between children who have crystallized attitudes about friendship from those that do not, thus establishing a better fit between sociometric scores and social participation scores.

3.4. DATA COLLECTION PROCEDURES

At the beginning of the study parents were notified regarding the research to be conducted. Parental permission was obtained (Appendix III). Initially, the experimenters spent some time at the preschool so that the pre-schoolers became familiar with the experimenters. This was to prevent a possible source of bias. The data were collected in the preschool. Each child was photographed to provide pictures for the sociometric assessments. Individual administration of the scale was done.
The tests were administered in the following order over a period of five weeks. For each child the Peabody Picture Vocabulary Test was administered first. The second were the sociometric ratings, the third the sociometric nominations, fourth the Crystallized Sociometric Ratings and finally the Crystallized Sociometric Nominations. The social participation observations were ongoing during the whole period of data collection.

Peabody Picture Vocabulary Tests were administered to all the children. The sociometric ratings and nominations and the Crystallized Ratings and Nominations were administered according to the procedures outlined above.

Naturalistic observations were made over a period of five-weeks. Each child was observed thirty times for a thirty-second observation and a ten-second record session during free play.

The reliability measure of the Revised Sociometric Scale was conducted later with a new sample of preschool children. This testing took a period of two weeks. The time between test and retest was ten days.
3.5. MEASUREMENT PROCEDURES AND ISSUES

Traditionally sociometric assessments have relied upon scores summed across subjects, and subsequently used these scores in the analysis of the social structure of the group being studied (Howes, 1988; Hymel, 1983; Marshall, 1957; Moreno, 1934; Newcomb & Bukowski, 1983). An example of this methodology is observed in the assessment of popularity which is measured as the sum of all the positive nominations received. Interestingly, interaction scores are also summed across specific interactions and yield a simple composite score for each child (Asher & Hymel, 1981; Gottman, Gonso & Rasmussen, 1975; Parten, 1932). This score is often in the form of an overall measure of social participation.

The sociometric scores, when compared to children's observed interactions with the same peers, have shown a low correlation, that is, a lack of fit between attitude and behavior. Researchers have used these low correlations to conclude that sociometry and social participation are different constructs.

The measurements in this study were developed to better understand the specific relationship between sociometry and social participation. The sociometric scores used both ratings and nominations. For the purposes of this study, all analyses were conducted by same-sex and same-class groupings.
only. Thus, for sample I there were four groups and for sample II there were two groups.

3.6. INSTRUMENTS

3.6.1 Naturalistic observations using time sampling:

This approach was used to obtain observational information to determine the patterns of social participation among children. It provides interaction patterns of children during free play situations (Parten, 1932).

Time sampling techniques restrict the behavioral units recorded and determine what, when and how the recording should take place (Touliatos and Compton, 1983). The time sampling technique was used for the systematic observation of children in free play situations.

Each child was observed using the modified interval sampling procedure (Powell, 1982), which has been found to produce consistently accurate data when estimating behavioral frequency and duration.

The observation sessions provided a total of 15 minutes of observations per child. Each 30 second observation session per child was followed by a 10 second record session. The highest level of social participation observed during the time interval was scored. For example, if two
children were observed at both the associative and cooperative levels, only the cooperative category was marked. This was regardless of the time the behavior sequence began, if the behavior was still occurring at the time of the observation then it was recorded. The criterion for occurrence was the behavior being observed at least once during the interval.

Every observation session involved the observation of all of the children in a predetermined order obtained by the use of random number tables. All same-sexed children involved in play with the subject were recorded along with the highest level of play interaction.

The levels of play observed (Parten, 1933) were coded into five levels: unoccupied, onlooker, solitary, parallel, associative and cooperative. These categories represent a continuum. Unoccupied play at the lowest level of social participation and cooperative play at the highest. This coding scheme produces information on the degree of social participation as well as the participating peers.

The six categories, each mutually exclusive and exhaustive. Parten has defined her categories as follows:

"Unoccupied behavior: The child apparently is not playing, but occupies himself with anything that happens to be of momentary interest. When there is nothing exciting taking place, he plays with his own body, gets on and off chairs, just stands around,
follows the teacher, or sits in one spot glancing around the room.

**Onlooker:** The child spends most of his time watching the other children play. He often talks to the children whom he is observing, asks questions, or gives suggestions, but not overtly enter into the play himself. This type differs from the unoccupied in that the onlooker is definitely observing particular groups of children rather than anything that happens to be exciting. The child stands or sits within speaking distance of the group so that he can see and hear everything that takes place.

**Solitary independent play:** The child plays alone and independently with toys that are different from those used by the children within speaking distance and makes no effort to get close to other children. He pursues his own activity without reference to what others are doing.

**Parallel activity:** The child plays independently, but the activity he chooses naturally brings him among other children. He plays with toys that are like those which the children around him are using but he plays with the toy as he sees fit, and does not try to influence or modify the activity of the children near him. He plays beside rather than with the other children. There is no attempt to control the coming or going of children in the group.

**Associative play:** The child plays with other children. The conversation concerns the common activity; there is a borrowing and loaning of play material; following one another with trains or wagons; mild attempts to control which children may or may not play in the group. All the members engage in similar if not identical activity; there is more division of labor, and no organization of the activity of several individuals around any material goal or product. The children do not subordinate their individual interests to that of the group; instead each child acts as he wishes. By his conversation with the other children one can tell that his interest is primarily in his associations, not in his activity. Occasionally, two or three children are engaged in no activity of any duration, but are merely doing whatever happens to draw the attention of any of them.

**Cooperative or organized supplementary play:** The child plays in a group that is organized for the purpose of making some material product, or of striving to attain some competitive goal, or of dramatizing situations of adult and group life, or playing formal games. There is a marked sense of belonging or of not belonging to the
group. The control of the group situation is in the hands of one or two of the members who direct the activities of the others. The goal as well as the method of attaining it necessitates a division of labor, taking of different roles by the various group members and the organization of activity so that the efforts of one child are supplemented by those of another." (Journal of Abnormal and Social psychology, 1932-33 pp. 249-251).

Training for observation was provided to two researchers. The observers were trained to distinguish between the categories of play and practiced recording and observation procedures. Researchers recorded observations on the same children, at the same time in isolation and then checked for agreement. Any discrepancies were discussed and coding definitions were modified to reduce confusion. A few practice sessions were held, using similar exercises, so that both the researchers were able to get reliable pieces of observations. A minimum of 90 percent inter-observer reliability was established prior to data collection.

For a period of two weeks the researchers were required to go to the preschool every day so that they became familiar with the children. The observers moved around the children with paper and pencils so that the children were used to being observed and did not become uncomfortable during the observations. The observers were also required to be familiar with the names of all the children in both the morning and afternoon sessions.
3.6.2. **Peabody Picture Vocabulary Test-Revised:**

The PPVT-R (Dunn and Dunn, 1981) is designed to measure receptive vocabulary for Standard American English. Hence, it is a test to determine the language and vocabulary level of the child. The PPVT has to be administered to the subjects to ascertain the level of comprehension of children.

The PPVT consists of two series of plates for each of the form L and M, respectively. Form L was used in this study. Each of the volumes contains 175 test items preceded by 5 training plates. After the chronological age has been established using the formula provided (Dunn and Dunn 1981, Page 6), it is possible to determine the starting point for the child. This point is a little below the standard receptive vocabulary of children of that age group.

The PPVT-R was found reliable with the split-half reliability coefficients for ages between two-and-a-half and eighteen years ranging from .67 to .88 on form L (median = .80). Immediate test-retest reliability ranges from .71 to .89; and the delayed reliability (one year or less) ranges from .54 to .90, with a median of .77 (Dunn and Dunn, 1981).

The PPVT-R meets concurrent validity standards for a picture vocabulary test measuring hearing vocabulary in Standard English. There is a high correlation between the
scores of the vocabulary sub test of the Wechsler Intelligence Scale for Children-Revised and the PPVT-R. Both tap the subject's comprehension of the spoken word even though the modes of expression may vary.

As the PPVT-R can be administered to all age groups, from two to adulthood, only those items within the subject's critical range were given. These consist of items that provide maximum discrimination among individuals of similar ability. The low limit of the range is the basal item, which is the highest 8 consecutive correct responses. The upper ceiling is the lowest eight consecutive responses with six errors.

The test was administered in a quiet room away from teachers and other children. The child and examiner were seated just around a desk or table corner from each other. The child was only able to see the plate being considered. The time taken to complete the administration of the test varied from child to child.

The children were first trained to point at that picture on the plate that is the same as the word said by the examiner. No clues were provided regarding the accuracy of the child's response. Each response was reinforced regardless of accuracy.

The quadrant selected was recorded using the number written below the administration form. The child was praised
generously, but each reinforcement was non-committal about
the correctness of the response.

The test ended when a child gave six incorrect
responses to eight consecutive questions. The number of the
last item on the ceiling range was the ceiling score.

To obtain the raw scores all errors occurring between
the highest basal level and the ceiling item were subtracted
from the ceiling score. These scores were then converted to
standard scores and then the developmental quotient was
calculated using the procedures outlined and the tables
provided in the manual.

The test procedures are outlined in the PPVT-R
manual.

3.6.3. The Sociometric Scales

The sociometric technique has been an important
instrument in the measurement of group structure, friendship
and popularity among peers. It is a process used for
assessing the attraction between individual members of a
specified group (Asher and Hymel, 1981). It focuses on the
understanding and measurement of social structures and
hierarchies within groups of people. Various types of
sociometric measures have been developed. Two major methods
of sociometric assessment that are frequently used with children are nominations and ratings.

3.6.3.1. The Picture Nomination Scale

The picture nomination scale (McCandless & Marshall, 1957) was used to determine the social preference of group members. Standardized pictures of all classmates were obtained against a white background. Photographs were taken with each child wearing a robe to reduce variability due to clothing.

The children were taken to a small room individually and were asked to nominate peers using the following procedure. The photographs shown were of the same-sex peers (Asher and Hymel, 1981). All the photographs were arranged on the table and then the child was asked to 'pick out the picture of the person s/he likes to play with the most'. The chosen photograph was removed, then, the procedure was repeated again to get the second nomination. These yielded social preference scores.

The scores ranged from -2 to +2. The responses were weighted, the first choice of positive nominations was given a weight of 2, the second a 1. The negative nominations were elicited after the positive nominations were obtained of the subject and scored -2 and -1. The first peer chosen with
whom the subject liked to play with the least, scored a -2, and the second choice of peers remaining who the subject did not want to play with was scored -1. The sociometric scores were calculated by averaging the total of the weighted scores received by peers by dividing by the number of nominations received.

3.6.3.2. The Rating Technique

The sociometric rating technique (Roistacher, 1974; Singleton and Asher, 1977; Thomas and Powell, 1951) measures the degree of social acceptance. Five faces were drawn on a white paper and attached to a long piece of poster board.
To train the children for this measurement, food pictures were used with the face board so as to help the children to understand the rating scheme. The child was given one picture at a time and asked how much s/he liked the food. It was explained that 'if you like the food a lot place the picture here' (point to the happiest face). All the faces were explained, the second face was to be used 'if you like it a little...', the neutral 'if you don't know or don't care...', the somewhat unhappy face 'if you don't like...', finally the saddest face was used 'if you really don't like...'. The faces were assigned scoring numbers from 5 being the happiest face to 1 being the saddest face. The neutral face was marked 3.

Each child was expected to rate all the members of the group, which was defined as all same-sex members in the class. The child was asked to place the picture of the
classmate on the basis of how much s/he liked to play with the her/him. The score of each ratee could range from a high of "five" to a low of "one".

The ratings ranged from high, namely, 'like to a lot', to low, that is, 'really don't like to'. The acceptance scores on each child were obtained. Additionally, the total ratings on each child were obtained. A low rating was an indicator that the rater did not like to play with the ratee, whereas a high rating indicated that the rater liked to play with the ratee. The rating score was calculated by dividing the total acceptance score of each child by the number of children in the subject's group. The scores could range from five to zero.

3.6.3.3. Reported reliability of the sociometric scales

Moderate concurrent validity has been established (McCandless and Marshall, 1957), by demonstrating a positive relationship between peer nominations and teacher ratings ($r = 0.47$, $p < .05$). Predictive validity has been seen in academic achievement in an elementary school (Kohn, 1977). Reliability of the nomination scale with children shows a test-retest correlation ranging from .32 to .78 (Hartup et al., 1967), and .56 at $p < .05$ (Asher et. al., 1979). This
instrument provides an accurate assessment of children's popularity within same-sexed peer groups (Asher and Hymel).

The test-retest reliability (Asher et. al., 1979) of the rating scale measure is high ($r(17) = .81, p < .01$). Test retest for 11 classes of third and fourth grade children over a six week period was found to be .84 (Oden and Asher, 1977). However, with preschoolers, (Asher et. al., 1979) it was lower ($r = .56, p < .05$). Concurrent validity has been established between the sociometric rating scale and partial rank-order sociometric scale (Thomas and Powell, 1951), implying that the scale provides a measure of social acceptance within the peer group.

3.6.4. Crystallized Sociometric Scales

3.6.4.1. Crystallized Sociometric Ratings

The rating scale (Roistacher, 1974; Singleton and Asher, 1977; Thomas and Powell, 1951), has been modified to provide the Crystallized Sociometric Rating measure.

A couple of distinct changes were incorporated into the original rating scale. Although it comprised of the five faces found in the original sociometric scale, eyes were added to each face to make it more realistic. The order of presentation of the faces was also changed. The two 'happy'
faces were followed by the two 'sad' faces. The neutral face did not have a mouth at all and was also put significantly away from the other four faces. The distance between the fourth face and the last face was double of the distance between the first, second, third and fourth faces. Having removed the face from being the neutral point between the happy and sad faces, it was presumed to have motivated only those children to use this face to rate a peer when their attitude was neutral.

Figure 2. The crystallized rating scale.

The assessment procedure used the standardized photographs of the children participating in the study. All the children were photographed against a white background and wore a solid colored smock so that the photograph would not have a bias due to clothes. The children were trained so that they were familiar with the gradations associated with
the faces used as in the rating scale. All children were tested individually in a separate room.

Each child rated the photograph of other children by placing it on the appropriate face, that is, from happy faces to sad faces, or the 'don't know'. All peers were rated by each subject.

A practice session was conducted with food pictures so that the children became familiar with the faces and the gradation of choices represented by each one of the faces. Once the experimenter was sure that the child understood the criterion for rating, one picture was handed out at a time and the child was asked to place the picture on a face depending on how much s/he wanted to play with the child.

The faces were scored 5, 4, 3, 2 and 1. Five being the most positive, two being the most negative and one the don't know face. The scores were obtained by summing the acceptance score for each child, and obtaining an average score for each subject by dividing the total score by the number of peers in the subject's group.
3.6.4.2. Crystallized Sociometric Nominations (CSN)

This measure is a modified version of the sociometric nomination scale developed by McCandless and Marshall (1957). The scale incorporates additional questions not in the original sociometric nomination technique to discriminate between children who have crystallized attitudes regarding friendship from those who do not.

Once a child nominated a particular peer, several open ended questions were asked. These questions and were formulated to discriminate the children with crystallized attitudes about their social participation with specific peers from those that had fluid attitudes. Questions were based on a technique to improve the attitude behavior fit through post stratification of opinion responses (Mason et all, 1985).

Eight screening questions were administered following each of the child's peer nominations. The selection of these questions was based on the theoretical propositions of friendship structure, development, and expectations given by Bigelow (1977), Bigelow and LaGaipa (1979), and Berndt (1981). The following questions were asked:
1. Can you pick out the pictures of all your friends?
2. Who do you like to play with the most?
3. Why do you like to play with -------?
4. Who does ------- like to play with the most?
5. What do you like most about -------?
6. Do you know what ------- likes to do the most?
7. Are there any things that you and ------- do that only you both know about?
8. Who is your best friend?

In the first part of the assessment the photographs of the child's friends were selected and the order of selection marked. This was the first question asked of the subjects. The pictures were arranged randomly on the table facing the child. The child was asked to 'pick out the pictures of all friends', beginning with the best friend. As the child picked up the pictures they were ranked as to which was chosen first, second and so on. Each picture that was chosen was removed and the remaining pictures rearranged. Of those children, (i.e the ones chosen by the subject as 'friends'), questions two through eight were asked. These were presented in the rank order of selection. The questions were asked in the same order given here.
3.6.4.3. Coding of the CSN.

The open ended CSN responses given in the crystallized nomination procedure were coded according to the detailed coding scheme provided below. To ensure standardization across subjects, a mathematical formula was used to calculate the crystallized nomination score for each child (see Appendix I).

The first question involved picking out 'the pictures of all your friends, beginning with your best friend'. As the child had all the flexibility in the number of 'friends' that could be chosen, there was a difference between those children who chose one friend versus those who chose many. Therefore the responses were weighted. The sum of all nominations score was equal to '1', eg. if the child made three choices the first was scored .545, the second .273 and the third .182. For a detailed explanation refer to Appendix I. The numbers obtained by this process were put under the variable "exclusivity of friendship". The scores for all subjects were put into a matrix format to get a subject by subject picture of all nominations given and received.

The second question was 'who do you like to play with the most?' These were scored like the unrevised nominations. The nominations were weighted, the first response getting the highest points and the last one the least. This coding
was also in the form of a nomination matrix and was used in later analyses to demonstrate the superiority of weighting the score for each subject as a fraction of one.

The third question was 'why do you like to play with ---?' For this question Bigelow's (1977) levels of friendship expectation were used. The response obtained from this question generated the variable "friendship concept", determining the level of friendship that the subjects had with their peers. These questions were targeted toward subjects who had crystallized attitudes about friendship.

Bigelow has identified three stages of friendship. In the first stage friendship is seen to be influenced by propinquity, in the second stage children expect friends to admire each other, the third stage of friendship encompasses mutual acceptance, loyalty and commitment, genuineness, common interests and a potential for intimacy.

The eight dimensions that have been reported to occur at different levels are developmental in nature. These dimensions have been listed below in increasing levels of cognitive complexity; (i) common activities, (ii) evaluation, (iii) propinquity, (iv) admiration, (v) acceptance, (vi) loyalty and commitment, (vii) genuineness, (viii) common interests and (ix) intimacy potential.

A few examples of the above categories follow.
(i) Common activities were given a score of '1' if the child said that 'I finger paint with him/her'.
(ii) Evaluation was given a score of '2'. Responses like 'she lets me play with her pony/doll/ plane', 'plays with me'. 'Is not mean to me'.
(iii) Responses appertaining to propinquity were scored '3', and included replies like 'stays close to my house', 'we come to school together' etc.
All the three categories described earlier constitute stage 1
(iv) Character admiration responses received a score of '4'. These included responses like 'like the way she does things', or 'he is a good sport', or the use of any positive adjectives describing the peer.
(v) Acceptance was reflected in responses which showed that the individual was liked despite some incompatible characteristics, or 'play together' 'sleep over at each others house'. These answers are scored '5'.
(vi) Loyalty and commitment were reflected in answers like 's/he believed me even when the others did not', tell each other things that no one else knows. This was scored '6'.
(vii) Genuineness was scored '7' and was reflected by 'I can be myself with him/her' 'don't need to pretend with ---- '. 'Tell the other person if they have done something wrong'.

(viii) Common interests were scored '8'. This category was marked for responses like 'both of us like doing -----'.
(ix) Intimacy potential scores the highest, i.e. '9'. It involves sensitivity to what the other was thinking, giving and sharing, trust and loyalty.

The fourth question elicited the nominators' perception of the nominee's friends. These were recorded and compared with the answer given by the nominee. If the answers agree a score of 2 was given. In cases of partial consensus, that is when at least one peer was the same, then 1 point was given and in case of no similarity of responses no score was given.

Question five, which asked 'what do you like most about -----?' was recorded verbatim and compared with the answer given by the nominees when they gave their nominations. All the responses were classified into the categories given by Bigelow (1977) and was explained above. The answers here were also scored in a similar manner.

The sixth question elicits the child's perception of the activities enjoyed by the nominee. This was recorded as a filter question. This was an awareness question and was scored 1 for accuracy and zero for an erroneous response. The question aimed to determine the degree of awareness with a peer's activities.
The seventh question attempted to determine the closeness and intimacy between the child and the nominee. An answer of 'yes' was scored 1, and 'no' did not score any points.

The last question was a final filter question and was asked after information on all the nominees had been obtained. It asked the name of the child's best friend. The response was recorded for later analysis. If the name given by the respondent was the same as in question two then, it was scored two. If the name was that of the child nominated second then a score of 1 was given. Any other response was not scored.
3.6.4.4. Development of variables to study the friendship structure.

For the purpose of this study, responses to questions one, two, three, and five were used to determine the level and strength of the friendship between the members of the peer group. Questions four, six, seven, and eight were used as filter questions to determine the correctness of the responses.

The nomination responses from questions one and two, yielded a crystallized preference score for each child. These scores, represented in a subject by subject matrix, portray the degree of "peer exclusivity" of the children's relationship with each other.

To more precisely assess the strength of the friendship between the nominator and each nominee, an even more refined measure was developed, using questions three and five. This variable was labeled "crystallized friendship". This was done by weighting the exclusivity scores for each child by their friendship concept. The friendship concept has been explained as the level at which subjects perceived their relationships with their peers. By multiplying the two scores, it was expected that a subject by subject picture of their crystallized friendship would emerge.
The following new measures were developed:

(a) Social participation  
(b) Peer Exclusivity  
(c) Friendship concept  
(d) Crystallized friendship  
(e) Forced choice nominations  
(f) Forced choice friendship  
(g) Crystallized ratings  
(h) Traditional ratings.

The first stage in the creation of the new measures was to standardize all scores. This was a necessity because individually each measure had a different range of scores. Raw scores would thus not be comparable across all variables. Therefore, each score obtained by every subject was standardized to reflect a percentage of one. This continuing process was done at every stage of coding for all variables and was essential in the calculation of discrepancy scores (exclusivity, crystallized friendship, forced choice nominations, crystallized ratings and traditional ratings subtracted from the social participation).
3.6.4.4.1. Social Participation

This variable was created to reflect the relative amount of time, and the level of play that each subject had while interacting with each of his/her peers. **Time sampling** was used to obtain observational information to determine the patterns of social participation between children. It provided interaction patterns of children during free play situations (Parten, 1932).

The levels of play observed were categorized into six levels: unoccupied, onlooker, solitary, parallel, associative and cooperative. These categories represent a continuum. Unoccupied play is the lowest level of social participation and was scored "zero", solitary play scored "one", onlooker "two", parallel "three", associative "four", and cooperative play scored "five". Information on the degree of social participation as well as the participating peers was obtained. This variable is the total participation score of the interaction patterns weighted by the level of play.

After standardizing these scores so that the sum of all scores for a child nominee totalled to one, a picture of the relative amount of time that the subject spent with different peers emerged. The score represented a proportion
of interaction spent with specific peers. It also enabled an assessment of time spent alone.

3.6.4.4.2. Peer Exclusivity

This variable was created with the assumption that depending on the number of peers nominated, the scores given to each nominee would vary. Exclusivity scores were obtained by allowing each subject to nominate all his/her friends in a decreasing degree of closeness. The standardized score is created by weighting the responses of every subject such that the sum of all the scores of the nominees is equal to one. Therefore, the value of the first nomination and the following nominations would increase with a decrease in the number of nominees. Any particular relationship is deemed to be more exclusive if the child nominates a few peers compared to nominating all peers. The formula used is as follows

\[ x + \frac{x}{2} + \frac{x}{3} + \ldots + \frac{x}{n} = 1; \]

where

\( x \) = the score obtained by the first friend nominated by the subject.

each fraction represents a nominee's score, and
n = the total number of friends nominated by the subject, and can have values ranging from zero to the number of children in the group the subject belongs to, excluding the subject.

3.6.4.4.3. Friendship Concept and Crystallized Friendship

This variable reflects the level at which the subject perceives his friendship with the nominated peers. The friendship concept has been derived using Bigelow's (1977) levels of friendship.

The friendship concept by itself does not reveal much about the level of the relationship. Hence, a new variable was created and called "crystallized friendship". To ensure that "crystallized friendship" would reflect a true nature of the relationship, the friendship concept was recoded. One was added to all scores obtained by each subject so that any computations made for a child by child comparison would not be negated into a "no score" as all "no responses" were originally recorded as zeros. This was necessary so that the exclusivity scores would not be multiplied by a zero.

Crystallized friendship was created by using the exclusivity factor and weighting it by the friendship concept. This is done by multiplying each individual
exclusivity score of every nominee by a corresponding friendship concept score. This new score is then standardized like the other variables to represent the sums of all scores of a subject to be a percentage of one.

3.6.4.4.4. Forced Choice Nominations

These were standardized scores of sociometric nominations obtained by using the traditional method of sociometric assessment (Marshall & McCandless, 1957). These scores were weighted by summing the total number of nominations (both positive and negative) received and then dividing the total by the number of nominations received by every subject.

Each subject could have a score ranging from -2 to +2. The score was represented as a degree of preference of a subject for four peers. For positive nominations the first choice being more preferred than the second. Negative nominations reflected the opposite, -2 being the least preferred and -1 preferred the second least in the group of peers.

As in other variables, the scores were represented in a sociometric matrix and for purposes of data manipulation each score was represented as a percentage of one.
3.6.4.4.5. Forced Choice Friendship

To create the variable forced choice friendship, forced choice nominations were multiplied with the friendship concept. That is, only the scores of the nominated peers were weighted by the friendship concept. As the friendship concept had already been recoded by adding one to all scores, effects of the "no responses" scores on the forced choice nominations was negated. The scores of the friendship concept ranged from zero to nine. This variable was created to differentiate the effects of exclusivity from that of justifying friendships with concepts. Forced choice per se does not allow for exclusivity and is therefore an important difference. The crystallized friendship score confounds friendship concepts with exclusivity. An inclusion of this variable will show the effects of both the variables separately. This variable was also standardized and each score represented as a percentage of one.

3.6.4.4.6. Crystallized Sociometric Ratings

The scores of the crystallized sociometric ratings were standardized to provide a subject by subject comparison of the degree of acceptance by their peers. Standardization of scores involved the summation of ratings received by each
subject and dividing the total score by the total number of same-sex peers in the group. Crystallized ratings, though based on the rating scales of Roistacher (1974), Singleton and Asher (1977), differ from the traditional ratings in that they provide the subject an option of responding "don't know" (D.K.). Mason (1985) found that this alternative increases the reliability of the measure by not putting the subject in a situation of being forced to make a choice.

The crystallized ratings should reflect a better attitude - behavior fit than the traditional ratings. The DK factor should weed out the subjects with borderline acceptance for certain peers instead of placing them into the "don't care either way" category. In this case also the scores were represented in a sociometric matrix.

3.6.4.5. Pilot Test of the CSN and CSR

A pilot test was conducted with four preschool children to evaluate the questions developed for the sociometric scales. The responses were analyzed, evaluated and when required, changes were made on the instruments before actual data collection.

The pilot study data was used to guide development of a coding scheme for the attitude responses on the Crystallized Sociometric Nomination Scale. Inter-coder
reliability was established. A minimum reliability of 80 percent was accepted. To ensure a 80 percent consensus, two researchers were asked to code the same interview questions and then compare the codes. Discrepancies were discussed and resolved.

3.6.5. Reliability of Nominations and Ratings

The test-retest reliability of the crystallized sociometric nominations and ratings should be greater than that of the traditional sociometric scores. Exclusivity, crystallized friendship and the friendship concepts for the crystallized nominations, and the crystallized ratings for time1 and time2 were correlated with each other.

As in the main body of data, the reliability data was represented in a sociometric matrix for each of the three variables. These were be standardized to project the total score for each subject to be a percentage of one. However, summing across subjects and obtaining a composite score to correlate time1 and time2 data will lose information regarding deviations in the subjects choice of nominees from time1 to time2.

The approach for the establishment of reliability entailed two parts. First, the scores for each nominee were
summed across a row for all subjects at both time1 and time2. Each nomination for a subject then becomes a variable for that group. These scores were then correlated to represent the consistency in the nominations given. In the second step, correlations for all variables were then averaged by child. These results are presented in the results section.

Inter coder reliability was calculated for two coders. Ten observations per child were simultaneously recorded by the two observers. The percentage of correspondence between the two was 90%. All discrepancies were discussed.
Chapter 4

RESULTS

The variables studied were forced choice nominations, peer exclusivity, friendship concepts, crystallized friendship, social participation, crystallized ratings and the traditional ratings. The ability of the Crystallized Sociometric Nomination and Rating Scales to discriminate between children with and without an attitude towards peers was measured.

"Social participation" was the comparison variable used to measure the strength of the children's attitude regarding friendship and their social status. It reflected the relative amount of time and the level of play of each subject while interacting with each of his/her peers.

The responses to questions one, two, three, and five (see section 3.6.4.2) were used to determine the level and strength of friendship between members of the peer group. These yielded a crystallized preference score for each child. These scores, represented in a subject by subject matrix, portray the degree of "peer exclusivity" of the children's relationship with each other. This variable was created with the assumption that depending on the number of peers nominated, the scores given to each nominee would
vary. A relationship is deemed to be more exclusive if a child nominates some peers compared to nominating all peers.

To assess the strength of the friendship between the nominator and each nominee more precisely, an even more refined measure was developed using questions three and five. This variable was labeled "crystallized friendship". This was done by weighting the exclusivity scores for each child by their friendship concept. The "friendship concept" has been explained as the level at which subjects perceive their relationships with their peers. This concept was gathered via probes in the form of open-ended questions regarding the level of friendship.

"Forced choice nominations" were standardized scores of sociometric nominations obtained by using the traditional method of sociometric assessment (Marshall & McCandless, 1957). "Forced choice friendship" was created by multiplying the forced choice nominations with the friendship concept, only the scores of the nominated peers were weighted by the friendship concept. This variable differentiated the effects of exclusivity from that of crystallized friendship.

Both "crystallized sociometric ratings" and the "traditional sociometric ratings" provide a subject by subject comparison of the degree of acceptance by their peers. Crystallized ratings, though based on the sociometric
rating scales of Roistacher (1974), Singleton and Asher (1977), differ from the traditional ratings in that they provide the subject an option of responding "don't know" (D.K.) instead of being neutral.

Data manipulation was made possible by obtaining one score for each child for every variable. Each variable is a summary score reflecting the discrepancy between social participation and sociometric nomination scores and between social participation and crystallized nomination scores. However, just doing that does not furnish an accurate picture of the social structure. The formulation of a socio-matrix facilitated the study of individual scores for each subject, and all the peers they interacted with, resulting in a more comprehensive picture.

A socio-matrix is a child by child representation of the scores on all variables providing information on all subjects. The subjects serve both as respondents (that is, as raters or nominators) and recipients (that is, as ratees or nominees) of peer preference or acceptance. Information loss using this process is minimal and various computations of data are possible.

To ensure that all the scores were standardized across subjects, a procedure was developed to represent the score of each nominee as a percentage of one. The sociometric rating scores, both traditional and crystallized, were
standardized by summing across subjects and weighting the scores by the total number of ratees.

This process helped to standardize the scores of all variables so that they could be compared with each other and yield comprehensible results.

4.1. **CALCULATION OF DISCREPANCY SCORES**

Standardization of scores resulted in six variables. These were the forced choice nominations, forced friendship, peer exclusivity, crystallized friendship, crystallized ratings, and traditional ratings. Social participation, an observational record of behavior, was used as a comparison variable.

Discrepancy scores for the traditional sociometric nominations and the crystallized sociometric nominations were calculated by subtracting from the social participation score, the scores of the other nomination variables listed above. Both crystallized and traditional ratings are discussed later. After the discrepancy scores were obtained, the scores of each subject were summed to give a composite score for every variable per child.
4.1.1. Nominations

The sociometric nomination measures were further transformed by calculating the discrepancy between social participation and the sociometric scores. This was done by subtracting the nomination variables from the social participation for each subject. As all scores were portrayed in a subject by subject socio-matrix, each individual score was subtracted.

For example, take two matrices with five subjects. Matrix "s" represents social participation scores and matrix "e" peer exclusivity for the same subjects, "c" represents columns and "r" rows.

Table 3. An example of the calculation of discrepancy scores.

<table>
<thead>
<tr>
<th>&quot;S&quot; Matrix</th>
<th>&quot;E&quot; Matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td>sc1 sc2 sc3 sc4 sc5 ec1 ec2 ec3 ec4 ec5</td>
<td></td>
</tr>
<tr>
<td>sr1 1 0 1 1 0</td>
<td>er1 1 0 0 1 1</td>
</tr>
<tr>
<td>sr2 1 1 1 1 0</td>
<td>er2 0 0 0 1 1</td>
</tr>
<tr>
<td>sr3 0 1 1 0 1</td>
<td>er3 1 0 1 0 0</td>
</tr>
<tr>
<td>sr4 0 1 1 0 1</td>
<td>er4 0 1 0 1 1</td>
</tr>
<tr>
<td>sr5 1 0 0 0 0</td>
<td>er5 1 1 1 1 1</td>
</tr>
</tbody>
</table>
Table 3. cont. An example of the calculation of discrepancy scores.

<table>
<thead>
<tr>
<th>(&quot;s&quot; - &quot;e&quot;)</th>
<th>....</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1</td>
<td>0-0</td>
</tr>
<tr>
<td>1-0</td>
<td>1-0</td>
</tr>
<tr>
<td>0-1</td>
<td>1-1</td>
</tr>
<tr>
<td>0-0</td>
<td>1-1</td>
</tr>
<tr>
<td>1-1</td>
<td>0-1</td>
</tr>
<tr>
<td>0-0</td>
<td>1-0</td>
</tr>
<tr>
<td>1-1</td>
<td>0-1</td>
</tr>
<tr>
<td>0-1</td>
<td>1-0</td>
</tr>
</tbody>
</table>

4.1.1.1. Attitude-behavior fit of the nomination variables.

To demonstrate the degree of the attitude-behavior fit between social participation and both the traditional sociometric nomination and crystallized sociometric nomination measures, six paired t-tests of the discrepancy scores were computed. The differences between the means and the probability levels were used to determine which variables showed the least discrepancy with social participation. The variable with the lower mean in each pair and a significant t-value indicated that it had a better attitude-behavior fit. See table IV.
Table 4. T-Values reflecting the attitude-behavior fit between the sociometric nomination variables and social participation.

<table>
<thead>
<tr>
<th>t-test pairs</th>
<th>means</th>
<th>t-value</th>
<th>2-tail</th>
</tr>
</thead>
<tbody>
<tr>
<td>crystallized friendships</td>
<td>1.0987</td>
<td>-5.39</td>
<td>.000</td>
</tr>
<tr>
<td>forced nominations</td>
<td>1.3952</td>
<td></td>
<td></td>
</tr>
<tr>
<td>crystallized friendships</td>
<td>1.0987</td>
<td>1.66</td>
<td>.105</td>
</tr>
<tr>
<td>peer exclusivity</td>
<td>1.0774</td>
<td></td>
<td></td>
</tr>
<tr>
<td>peer exclusivity</td>
<td>1.0774</td>
<td>-6.06</td>
<td>.000</td>
</tr>
<tr>
<td>forced nominations</td>
<td>1.3952</td>
<td></td>
<td></td>
</tr>
<tr>
<td>forced friendships</td>
<td>1.4075</td>
<td>1.18</td>
<td>.245</td>
</tr>
<tr>
<td>forced nominations</td>
<td>1.3952</td>
<td></td>
<td></td>
</tr>
<tr>
<td>forced friendships</td>
<td>1.4075</td>
<td>6.38</td>
<td>.000</td>
</tr>
<tr>
<td>peer exclusivity</td>
<td>1.0774</td>
<td></td>
<td></td>
</tr>
<tr>
<td>forced friendships</td>
<td>1.4075</td>
<td>5.79</td>
<td>.000</td>
</tr>
<tr>
<td>crystallized friendships</td>
<td>1.0987</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The paired t-tests indicate that peer exclusivity (M=1.0774, t = -6.06, p = 0.000) as a sociometric measure yields significantly less discrepancy with social participation than forced choice nominations (M=1.4021). When comparing crystallized friendship (M=1.0987, t = 1.66, p = 0.105), it is possible that the effect of peer exclusivity (M = 1.0774) is confounding as crystallized
friendship is actually exclusivity weighted by the friendship concept. Although crystallized friendship is not very different from peer exclusivity, the latter is a better fit. However crystallized friendship ($M = 1.0987, t = -5.39, p = 0.000$) shows significantly less discrepancy than forced choice nominations ($1.3952$).

Forced choice nominations and forced choice friendships were not significantly different. However, when forced choice friendship ($M = 1.4075$ and $1.4075$ respectively) discrepancy scores were compared with both peer exclusivity ($M = 1.077, t = 6.38, p = 0.000$) and crystallized friendship ($M = 1.0987, t = 5.75, p = 0.000$), both were significantly less discrepant with social participation than were the forced choice nominations.

Thus, crystallized friendship shows less discrepancy with social participation than do forced choice nominations. Exclusivity when compared to forced choice friendships is less discrepant. This would indicate that the friendship concept per se does not emerge as a better indicator of social participation. It can also be inferred that the crystallization of friendship concept does not necessarily affect the actual social participation.
4.1.2. Ratings

To facilitate data manipulation for the ratings, both crystallized and traditional, each score for every subject was correlated with a corresponding score for the same subject in social participation. The process involved arranging the scores in a socio-matrix for both the rating scores and the social participation scores. For example, the scores on ratings and social participation for three subjects would be represented as follows.

Table 5. An example of the calculation of both traditional and crystallized sociometric rating scores

<table>
<thead>
<tr>
<th>ratings</th>
<th>sopart.</th>
<th>correlate R&amp;S</th>
<th>average corr =</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td></td>
</tr>
<tr>
<td>0 1 4</td>
<td>10 22 33</td>
<td>0/10 1/22 4/33</td>
<td>EX1=/3</td>
</tr>
<tr>
<td>5 0 2</td>
<td>12 34 45</td>
<td>5/12 0/34 2/45</td>
<td>EX2=/3</td>
</tr>
<tr>
<td>3 3 0</td>
<td>55 11 10</td>
<td>3/55 3/11 0/10</td>
<td>EX3=/3</td>
</tr>
</tbody>
</table>

The above manipulation will yield an average matched correlation between social participation and crystallized ratings and also between social participation and
traditional ratings. The reason that ratings were not standardized as a proportion of one was because ratings are not a proportion of preference of a ratee but an absolute amount of acceptance designated by a subject to every peer in the group.

Table 6. t-value comparisons of traditional and crystallized ratings.

<table>
<thead>
<tr>
<th>t-test pair</th>
<th>mean</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>crystallized ratings</td>
<td>0.2244</td>
<td>-0.85</td>
<td>.400</td>
</tr>
<tr>
<td>traditional ratings</td>
<td>0.1928</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Once the average correlation has been calculated for both the crystallized and traditional rating scores with social participation, a paired t-test was calculated to determine if there was a difference between the crystallized and the traditional ratings. The crystallized ratings ($M = 0.2244$, $t = -0.8518$, $p = ns$) were not different than the traditional ratings ($M = 0.1928$). The means indicate that the crystallized ratings may be a slightly better indicator of social participation than the traditional rating technique. However, the difference is not significant.
4.1.3. PPVT and Age

Age and language ability (PPVT-R) were used as control variables. There is no significant correlation between age and PPVT. When the scores from the friendship concept were correlated with PPVT a correlation of .32 was established which was not significant.

The above findings seemed to indicate that the degree of language acquisition and expression did not alter the friendship structure. This was concluded because it was expected that the higher a PPVT score the greater would be the ability of a subject to give reasons for peer nominations and exclusivity.

A multiple regression analysis of the difference between the three pairs derived from the discrepancy scores of peer exclusivity, crystallized friendship, and forced choice nominations was conducted. Age and PPVT were the independent variables. The constant was interpreted as the dependent variable, in this case a difference score. Results did not show any significant ability of either age or PPVT to affect exclusivity, crystallized friendship, or the forced choice nominations.
Table 7. Effect of language and age on peer exclusivity, crystallized friendship, and forced choice friendship.

<table>
<thead>
<tr>
<th>VARIABLE (dep)</th>
<th>CONSTANT</th>
<th>STD. ERROR</th>
<th>T-VALUE</th>
<th>SIG. T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forced-Excl.</td>
<td>-.304690</td>
<td>.430883</td>
<td>-.707</td>
<td>.4835</td>
</tr>
<tr>
<td>Cryst.-Excl</td>
<td>-.084432</td>
<td>.116123</td>
<td>-.727</td>
<td>.4713</td>
</tr>
<tr>
<td>cryst.-Forced</td>
<td>-.163313</td>
<td>.448379</td>
<td>-.364</td>
<td>.7175</td>
</tr>
</tbody>
</table>

To confirm this, the peer exclusivity data was recoded to count the total number of peers that each subject nominated. This recoding helped to determine the proportion of time that the subjects wished to spent with their nominees. This score was correlated with age and the PPVT scores. A correlation of .19 (ns) and .45 (p < .01), demonstrated that it was the language skill that affected the number of peers nominated. The more verbally skilled the children, the larger the number of nominations they were likely to make.

4.2. STABILITY OF THE NOMINATIONS AND RATINGS

The stability of the crystallized sociometric nominations and ratings were calculated and compared to those of the traditional sociometric nominations and ratings.
4.2.1. **Nominations**

The average correlation coefficient of the friendship concept for Sample II at time one and time two was calculated. This was done by correlating the two sociomatrices of all friendship concepts obtained for each nominee at the two points in time. This child by child correlation was .32 and not significant. However, when a total composite score was obtained by summing across each subject, the correlation between time one and time two scores was .57 (p < .05).

The forced choice nomination sociomatrix was also compared over time one and time two and yielded a coefficient of .36 which was not significant.

The crystallized nominations demonstrated an even lower correlation (.19, p = ns). However, when the total number of children nominated was analyzed over time, the correlation was higher (.63, p < .01). This would indicate that over time, the subjects nominated a similar number of peers.

4.2.2. **Ratings**

As was done for the nominations, a sociomatrix was used to obtain a subject by subject comparison of the crystallized ratings over times one and two. The two
sociomatrices were correlated \( (r = .62, p < .05) \), when the scores were summed across for each subject, and an average obtained, the scores correlated better \( (r = .79, p < .01) \).

The traditional rating scores were also stable over time. Correlating the sociomatrices at time one and time two, the correlation was lower \( (r = .54, p < .05) \) than when the scores were summed across a subject to get one composite score \( (r = .71, p < .01) \).

These findings indicate that the crystallized ratings are more stable over time compared to the traditional ratings. Although the sociomatrix comparison yielded a lower correlation in both cases, traditional and crystallized, it does give a more comprehensive picture of the social structure because a subject by subject comparison is available.
Chapter 5

DISCUSSION and CONCLUSION

Sociometric scales have been increasingly used for the assessment of peer relations because of their benefit over other measures used for the same purpose. The sociometric technique provides a means to obtain information on a large number of children in a relatively short period of time (Asher & Hymel, 1981). This technique also allows peers themselves to evaluate each other and the group, thus eliminating adult bias, and indexing social status.

The purpose of this study was to develop sociometric scales which would help to improve the attitude-behavior fit between sociometry as a measure of attitudes and social participation as a measure of behavior. Children were assessed in terms of those with crystallized friendships with members of their peer group, versus those that had more fluid relationships. In addition the degree exclusivity of individual peer was examined.

Mason et al (1988) have demonstrated that when any thought provoking opinion questions are asked, the inclusion of "what" and "why" open-ended questions help to distinguish between people who can give reasonable answers versus those who are unable to do so.
Based on this premise, allowing for subjects to express crystallized preference for peers should increase the fit between who they play with and who they want to. Selecting unlimited peers from their group should facilitate the selection of friends from non-friends.

The degree of crystallization of a child's attitude regarding friendship would be an important determinant in the study of peer relations. There are two ways of looking at crystallized attitudes. First, the degree to which the relationship is exclusive and second, based on the friendship concept or the level at which the friendship is perceived.

Children with fluid attitudes would not be expected to have exclusive friends. They may also have low levels of friendship (Berndt, 1981; Bigelow & LaGaipa, 1977) with their peers. These children could call all their peers their friends or have no friends. Responses elicited regarding friendship patterns may not correspond to observations during free play for non-friends if children do not have crystallized attitudes about friendship (Hinde, Titmus, Easton, & Tamplin, 1985; Howes, 1988).

It is assumed that the children with crystallized attitudes about certain friendships will respond differently about selected friends when these friends are compared to other non-friends (Hinde, Titmus, Easton, & Tamplin, 1985).
Crystallized attitudes would prompt a child to justify the friendship and perceive the relationship at levels higher than those with non-friends (Bigelow & LaGaipa, 1975; Hartup, Laursen, Stewart, & Eastanson, 1988).

5.1. CRYSTALLIZED AND TRADITIONAL SOCIOMETRIC NOMINATIONS

5.1.1. Peer exclusivity

The concept of peer exclusivity implies the ability of children to form exclusive and firm friendships with some of the members in their designated peer groups. The results indicate that peer exclusivity yields significantly less discrepancy with social participation than do forced choice nominations. This finding substantiates the hypothesis that exclusivity of friendship will be a better reflection of social participation than will the forced choice nominations.

By allowing subjects to select unlimited peers from their group, the error factor due to the constraint imposed on the subjects is reduced. Mason (1985) technique for the enhancement of the attitude-behavior fit has been resubstantiated here and the concept used to determine the attitude-behavior fit between children's sociometric choices and social participation. The open-ended questions
facilitate the attitude-behavior fit when peer exclusivity is compared to the subjects actual social participation.

This finding questions the finding of Howes (1988) who reported friendship structures, social status, and social participation to be completely independent of each other. One reason for this variation could be the difference in the method of data manipulation. The use of sociomatrices allowed a subject by subject comparison, helping to minimize the loss of information. Therefore, although friendship structures, social status, and social participation are different measures they are related to each other. All the three aspects determine peer relations with a different methodological emphasis.

Traditional sociometric nomination studies dichotomize 'friends' and 'non-friends' in a group by requiring each subject to identify three to five friends and classifying the rest of the peers in the class into a homogenous group of 'non-friends' (Bigelow & LaGaipa, 1980). Most preschool children have been found to make stable distinctions between friends and other members of the peer group. This has been demonstrated among older children both in free play, where children spend greater time with friends than others, and in sociometric interviews (Hinde et al., 1985). Thus, peer exclusivity demonstrates a better attitude-behavior fit than
forced nominations, the former providing a better measure of peer preference.

The focus of studies on in-group and out-group peer preferences also use the traditional sociometric peer nomination scale that severely restricts the number of 'others' a child can choose and generally results in the nomination of few very close friends. It is possible that because of the limited choice, only in-group members are nominated (Schofield and Whitlley Jr., 1983). This is demonstrated by the present study by finding peer exclusivity to be a better predictor of social participation than the traditional sociometric measures.

As a large number of sociometric studies are conducted in preschool situations, no differentiation is made between the degree of acquaintance of the 'non-friends' with that of the child's friend. By assuming the degree of acquaintance to be the same for all members of a peer group in the preschool situation, the existence of exclusivity in the friendship structure of the children in this age group is not taken into account.
5.1.2. **Crystallized friendship:**

A basic assumption of this study was that the higher the level of the friendship concept, the more crystallized the subject's attitude about friendship is likely to be. By eliciting the friendship concept it would be possible to distinguish between children with crystallized attitudes about friendship from those who still have fluid attitudes.

The existing sociometric techniques do not distinguish between the two kinds of attitudes. To better understand sociometry in relation to the nature of friendship among children, crystallized friendship was studied.

It is possible that the effect of peer exclusivity is confounding as crystallized friendship is calculated by multiplying peer exclusivity by the recoded friendship concept. But, crystallized friendship shows significantly less discrepancy with social participation than does forced choice nominations. However, crystallized friendship does not provide a significant improvement of the friendship structure compared to peer exclusivity. Crystallized friendship displays a better relationship with social participation than forced choice friendship and forced choice nominations.
Forced choice nominations and forced choice friendships were not significantly different from each other. However, when forced choice friendship discrepancy scores were compared with both peer exclusivity and crystallized friendship, both the crystallized sociometric nomination measures indicated a better fit with social participation.

This would indicate that the frequency of play is positively related to peer acceptance (Marshall & McCandless, 1957). In all categories of a friendly nature in spontaneous play, the degree of a child's participation is positively related to his or her sociometric score. However, in a study of older children (Dishion et al, 1991) it was reported that not all interactions of a friendly nature signified peer group acceptance. Even when antisocial children were not accepted by their peers, they still had high interaction with their nominated friends (Andrews et al., 1991).

Studying the social participation and sociometric popularity in preschool children, Krantz (1982) reported the sociometric scores of same-sex peers. It was found that children who were relatively high in social participation were more aware of the friendship patterns of their peers and were also perceived as more popular by their peers. Social participation and popularity were all significantly related to each other. In this study however, the friendship
concept per se does not emerge as a better indicator of social participation, but the peer exclusivity does. This makes peer exclusivity a major contribution of this study.

Assessing individual differences in preschool competence Rubin & Daniel-Beirness (1983) found that positive interactions were significantly correlated with sociometric status. In the present study, both peer exclusivity and crystallized friendship are significantly better than forced choice nominations regarding their fit with social participation scores. However, crystallization of friendship concept does not necessarily contribute to the actual social participation with the same children.

Thus, crystallized friendship demonstrates a better fit with social participation than do forced choice nominations. Exclusivity when compared to forced choice friendship is also an improved measure of the attitude-behavior relationship.

5.1.3. Crystallized and traditional ratings:

The crystallized ratings did not demonstrate a better fit with the social participation than the traditional ratings, even though the average correlation of social participation with crystallized ratings ($r = .22$) was greater than that of traditional ratings ($r = .19$). As the
crystallized ratings did not prove to be a significant improvement to the traditional ratings, the findings did not support the hypothesis that crystallized ratings are a better predictor of social participation than the traditional ratings.

This finding could imply that although the children rated all their peers, the ratings were more an indication of the degree of acceptance of their peers than an assessment of friendship. It was expected that providing a choice of "don't know" in the crystallized rating scale would improve the scale in comparison to the traditional rating scale. But, the crystallized sociometric ratings were not significantly better.

Peer acceptance utilizes the ratings of all members of the peer group by asking members to report how much they like to play with each other (Hymel & Asher, 1977). Friendliness and adept social interactions have been found to influence peer acceptance in early childhood (Hartup, 1983 and 1991; Coie, Dodge & Kupersmidt, 1990).

Howes (1988) has reported similar findings for standardized traditional ratings and observed behavior. She found that relations between observed behavior and standardized sociometric ratings were moderately correlated. Ratings for both groups of three- and four-year-olds correlated with play. This is true in this study too.
5.1.4. PPVT, Age, and Sociometry

Both age and PPVT failed to show any significant relationship with forced nominations, crystallized friendship, and peer exclusivity. This is contrary to the findings reported by Damon (1983). According to Damon (1983) the model of children's peer relationship is founded on friendship with the qualities that children seek in a friend, changing with age.

Although the subjects' ages ranged from 38 months to 68 months, within each group however, the range was not more than 23 months. Age only correlated at .187 with PPVT. This correlation was not significant. The sample in this case could be considered homogenous, age would not be expected to influence the level of friendship concepts or be related to language scores.

A significant correlation of .45 between the number of peers nominated and PPVT demonstrated that it was the language skill that affected the peer exclusivity. The more verbally skilled the children, the larger the number of nominations they were likely to make.

As the number of children in each of the six groups was not many, it is possible that age and language effects were found contrary to expectations. This was possible because the maximum number of children in each group of children was
not more than thirteen, the minimum being ten. Statistical analyses on them are likely to bias the results.

5.2. STABILITY OF THE CRYSTALLIZED NOMINATIONS AND RATINGS

Depending on the methodology used for the assessment of stability of the crystallized sociometric scores, the results differ. Sociomatrix comparisons of the friendship concept, a measure of the crystallized nominations, exhibit low stability \((r = .32)\), when compared over a period of ten days. The same scores summed across the for each subject (to provide an average friendship concept score demonstrate a higher stability \((r = .57, p < .05)\). These moderate correlations suggest that there is possibly an improvement in the stability of the friendship concept. This improvement may be because it was a correlation of the average level of the friendship concept that the subject perceived himself to be at time one and time two. This correlation did not necessarily imply interaction with the same peers.

Measuring the stability over a four week period Asher et al. (1979), found that the positive nominations correlated .56, and .38, for two preschools.

The stability of both the crystallized sociometric nominations and the forced choice nominations was low.
There could be a couple of reasons for this. First of all it is likely that at the preschool age relationships change frequently and may be based on current circumstances existing between peers. Children may also not understand the sociometric procedure very well (Hymel, 1983). Secondly, the measure may be more sensitive to these changes. This may be because the subjects are required to first nominate their peers and then to assign the degree of friendship that they perceive with the nominated peer. This factor is likely to make the measure more stringent and sensitive to changes, reflecting a lower stability over time.

Crystallized ratings were found to be more stable than the traditional ratings. The sociomatrix comparisons yielded a moderate correlation over time which increased when the scores were summed across each subject (See Table V). Howes (1988) reported that relations between observed behavior and standardized sociometric ratings were moderately correlated. She speculated that the rating scale provides a more reliable index of peer relations than the nomination technique as there are a larger number of observations from which the score is derived.

The sociometric ratings have been found to be more stable over time than the sociometric nominations in preschool-age children (Asher et al., 1979). Therefore, it was concluded that the rating scale measure was more
reliable than both the positive and negative nomination measures. The results of this study concurs with Asher et al (1979). Despite the sociomatrix comparisons yielding a lower correlation in both the traditional and revised rating scales, it did provide a more comprehensive picture of the social structure, by furnishing a child by child comparison of the social structure in the peer group.

5.3. LIMITATIONS OF THE CURRENT STUDY

Due to some methodological considerations findings of this study may be affected. These factors involve sampling and data collection.

The sampling method was not random as the subjects were students in the two laboratory preschools at the university. The sample size was also small, which would restrict the ability to generalize the findings. Also statistical analyses would be affected due to the sample size as all analysis was done by same-sex and same-class groupings (see Tables I and II).

The reliability of the crystallized sociometric procedures needs to be simplified so that it would be possible to get accurate results without any confusion. One of the reasons for the difficulty in the establishment of reliability was the many levels at which the responses had
to be consistent. Not only was the nomination of the same peers important, but also the level at which they perceived their friendship at time one and time two.

Child-by-child comparisons increased the stringency of the measure, making it much harder to demonstrate the stability of peer relations over time. This was due to the fact that the scores were not analyzed as an average of the nominations or ratings but represented the actual nomination or rating that each subject gave and received. The picture in this method of analysis is more comprehensive.

Language ability affected the number of peers nominated. This was unexpected and implied that the communication made the verbalization of friendship choices possible, hence, there was a correlation between language and the number of peers nominated as friends. Studies involving older children have stressed the importance of communication skills in friendship formation (Furman & Childs, 1981 in Hartup, 1991; Gottman, 1983). These findings suggest that the administration of the CSR and CSN to non English-speaking children may bias the conclusions. The present sample had children who spoke languages other than English as their primary spoken language.
5.4. IMPLICATIONS FOR FUTURE RESEARCH

More repetitions with a larger sample size are recommended. The attitude – behavior research can be improved by following Mason et al's (1985) paradigm and providing subjects with a choice of open-ended responses and giving them a choice to not answer rather than being forced to make a choice.

The methodology used in the analysis of data resulted in a minimal loss of information. It suggests that the use of sociomatrices in comparisons of variables would be more sensitive for the assessment of social status and group structures.

The findings of this study exhibit an improved attitude-behavior fit with preschool children, revealing that three- to five-year-olds are capable of having exclusive peer relations. This would provide an extension to the friendship theories of Bigelow and LaGaipa (1975, 1977, & 1980) and Berndt (1981).

The crystallized sociometric nominations were not significantly stable over time. This could have two implications for future research. First, the results obtained by the use of sociomatrices could be an indication that in fact, nominations are not as stable as they appear to be when child-by-child comparisons are done. Secondly,
that the use of average nomination scores may provide a false picture of a stability that does not exist. This would be worth further investigation. Research has shown the sociometric ratings to be more stable over time than sociometric nominations (Asher et al., 1979). This finding was also reported in the present study.

Sociometric scales are used with children as pre-diagnostic measures of social problems (Asher & Gottman, 1981; Hartup, 1978 & 1991; and Rubin & Ross, 1982). The scales help in the selection of children for intervention and monitor their progress in social development (Oden & Asher, 1977). In a review of peer relations in early and middle childhood, Hartup (1991) concluded that children who have difficulty in relating to their peers are at risk, and "face a more uncertain future" (pp 17). This would imply that with an instrument providing an increased attitude-behavior fit, more at-risk children could be identified at an even earlier age. The crystallized rating and nomination scores could be utilized as predictors of social interaction problems among children.

5.5. IMPLICATIONS FOR THEORIES OF PEER RELATIONS

The primary purpose of this study was to develop a sociometric measure which would improve the attitude-
behavior fit in peer relations. The measure helped to
distinguish between children who had crystallized attitudes
about friendship from those who had fluid attitudes.

Parallel to Berndt's (1981) theory of friendship
development, this study does not find a developmental trend
in the level of friendship. Age was not a significant
contributor to the level of a child's friendship concept.

Bigelow and LaGaipa (1975, 1977, 1980.) had formulated
the theory of friendship values and expectation based on the
premise that preschool children are too young to be able to
form friendships of a stable nature. They used six to
fourteen-year-old children to write essays on friendship
which were used to form the theoretical model.

The current study was conducted with children between
the ages of three and five years, some of who demonstrated
the ability to form exclusive relationships with their
peers. As there are only a few longitudinal studies that
have provided information beginning from preschool (Gottman,
1983; Rubin & Daniels-Bierness, 1983), these findings
replicated by the use of the CSN and CSR scales would be
worth further investigation, and may be a significant
addition to the study of friendship development.

Some preschool children showed the ability to form
crystallized friendship with their peers. The peer
exclusivity was a better construct to improve the attitude-
behavior fit than the traditional sociometric measures, when predicting social participation during free play situations. The research partially corroborates Mason's (1985) theory of enhancing the attitude-behavior fit through post-stratification of opinion responses as well as providing the "don't know" option. It seems to make the crystallized nomination scale more predictive.

5.6. CONCLUSION

Sociometry is used for the assessment of various aspects of peer relations. However, the degree to which sociometric scores represent actual behavior has always been questioned. It is known that interactions between friends are different from those between nonfriends (Hinde et al., 1985). Hartup (1991) claims that as soon as early childhood, friends develop "a sense of mutual attachment and common interests" (pp. 24). For preschoolers, this involves common activities and reciprocity.

The purpose of this study was to develop an assessment that strengthened the attitude-behavior fit, as measured by the congruence between crystallized sociometric scales and observation of children's social interactions during free play. The crystallized nomination measures aspire to establish the level of friendship among members of a peer
group, as well as determine the role of peer acceptance in predicting social participation with the same peers. Peer exclusivity among preschoolers is a significant contribution.

This study provides a more efficient methodology to improve the attitude-behavior fit. The crystallized sociometric nominations have established themselves as being better predictors of social participation than the traditional sociometric nominations. The process of unlimited number of peer nominations as well as the option of a "don't know" response have improved the sociometric measure.

There still may be questions regarding the constructs of social participation and sociometric nominations and ratings. Both measure peer relations, however, one is a behavioral assessment, the other an attitudinal measure. These measures are correlated however, conceptually they are different aspects of peer relations, whose relationship can be influenced by measurement methods.
REFERENCES


APPENDIX I

Formula for the derivation of exclusivity

Exclusivity scores are obtained by allowing each subject to nominate all his/her friends in a decreasing degree of closeness. The standardized score is created by weighting the responses of every subject such that the sum of all the scores of the nominees is equal to one. Therefore, the value of the first nomination and the following nominations would increase with a decrease in the number of nominees. The relationship is deemed to be more exclusive if the child nominates just one or few peers compared to nominating all their peers.

The formula used is as follows

\[ x + \frac{x}{2} + \frac{x}{3} + \ldots + \frac{x}{n} = 1 \]

\( x \) = the score obtained by the first friend nominated by the subject.

\( n \) = the total number of friends nominated by the subject. "n" can have values ranging from zero to the number of children in the group the subject belongs to, excluding the subject.

For purposes of demonstration the formula will be solved for various values of "n".

"n" = 1
\[ \frac{x}{1} = 1 \]
\[ x = 1 \]

"n" = 2
\[ \frac{x}{1} + \frac{x}{2} = 1 \]
therefore, \[ 2x + x = 2 \]
therefore, \[ 3x = 2 \]
therefore, \[ x = \frac{2}{3} = .67 \]
\[ \frac{x}{1} = .67 \]
\[ \frac{x}{2} = .33 \]
\[ \frac{x}{1} + \frac{x}{2} = 1 \]
"n" = 3
\[ \frac{x}{1} + \frac{x}{2} + \frac{x}{3} = 1 \]
therefore, \( \frac{(6x + 3x + 2x)}{6} = 1 \)
therefore, \( 11x = 6 \)
therefore \( x = \frac{6}{11} = .545 \)
\( x/1 = .545 \)
\( x/2 = .273 \)
\( x/3 = .182 \)

"n" = 4
\[ \frac{x}{1} + \frac{x}{2} + \frac{x}{3} + \frac{x}{4} = 1 \]
therefore, \( 12x + 6x + 4x + 3x = 12 \)
therefore, \( 25x = 12 \)
x = \( \frac{12}{25} = .48 \)
x/1 = .48
x/2 = .24
x/3 = .16
x/4 = .12

Values are being provided for "n" = 9 as that was the maximum number of friends nominated by a subject.

"n" = 5
\( x/1 = .438 \)
\( x/2 = .219 \)
\( x/3 = .146 \)
\( x/4 = .109 \)
\( x/5 = .088 \)

"n" = 6
\( x/1 = .408 \)
\( x/2 = .204 \)
\( x/3 = .136 \)
\( x/4 = .102 \)
\( x/5 = .082 \)
\( x/6 = .068 \)

"n" = 7
\( x/1 = .386 \)
\( x/2 = .193 \)
\( x/3 = .129 \)
\( x/4 = .096 \)
\( x/5 = .077 \)
\( x/6 = .064 \)
\( x/7 = .055 \)
"n" = 8
   x/1 = .368
   x/2 = .184
   x/3 = .123
   x/4 = .092
   x/5 = .074
   x/6 = .061
   x/7 = .052
   x/8 = .046

"n" = 9
   x/1 = .353
   x/2 = .172
   x/3 = .118
   x/4 = .088
   x/5 = .071
   x/6 = .059
   x/7 = .050
   x/8 = .044
   x/9 = .039
APPENDIX II

Letter of Permission from Parents

April 25, 1988

Dear Parents,

I would like to take this opportunity to inform you of the research activities that will occur at the Child Development Center for the remaining term of school. Your support for our research endeavor is vital and will be greatly appreciated.

Within the next five weeks, your child will be interviewed individually about their social preferences. This will take approximately ten minutes. The interviews are conducted using a game like format which children invariably enjoy.

In addition, your child's play with other school mates will be observed and recorded. We are interested in the type of interaction that occurs during free play situations. These observations will provide us with valuable information regarding patterns of social interaction.

Children will be selecting pictures of classmates with whom they enjoy playing. Two other activities will be conducted individually. These will take a little over five minutes each.

Your child's participation will be really appreciated. If you have any questions or concerns about the research, please feel free to call me at 754-4765 or 753 8231.

Thank you for your cooperation.

Sincerely,

Ila Shankar, Graduate Student
David Andrews, Ph.D.
Principal Investigator
Department Head
Department of Human Development and Family Studies
November 2nd. 1989.

Dear Parents,

I would like to take this opportunity to inform you of the research activities that will occur at the Child Development Center for the next three weeks of school. Your support for our research endeavor is vital and will be greatly appreciated.

Within the next three weeks, your child will be interviewed individually about his/her social preferences. This will take approximately ten minutes. The interviews are conducted using a game like format which children invariably enjoy.

Children will be selecting pictures of classmates with whom they enjoy playing. Your child's participation will be really appreciated. If you have any questions or concerns about the research, please feel free to call me at 645-3328 or 737-4765.

Thank you for your cooperation.

Sincerely,

Ila Shankar, Graduate Student
Principal Investigator
Department of Human Development and Family Sciences.