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Reliability and validity of a sociometric picture rating scale for preschoolers.

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RELIABILITY AND VALIDITY OF A
SOCIOMETRIC PICTURE RATING SCALE
FOR PRESCHOOLERS

A Dissertation Presented

by

JOANNE FRANCES KALESNIK

Submitted to the Graduate School of the
University of Massachusetts in partial fulfillment
of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 1990

School of Education

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DEDICATION

To the hope that this research
might benefit all the kids
"whose names are never called
when choosing sides
for basketball."

ACKNOWLEDGMENTS

I acknowledge and thank the members of my committee, Dr. Ena Vazquez Nuttall, who served as chairperson, Dr. Marla Brassard and Dr. Gail McGee for their insightful comments and supportive feedback. Their guidance and belief in this research were motivating and most appreciated.

This project would not have been possible without the participation of thirty-two boys and girls attending preschool programs in Western Massachusetts. I thank them for their cooperation and enthusiasm. I also acknowledge the teachers who willingly became involved and the parents who gave permission for their children to participate.

Finally, I thank my family members and friends, not only for their support of my dissertation research, but for the many positive social experiences they have provided me with through the years. Their friendships are quite special.

ABSTRACT

RELIABILITY AND VALIDITY OF A SOCIOMETRIC PICTURE RATING SCALE FOR PRESCHOOLERS

MAY 1990

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The purpose of this study was to investigate the degree to which preschool children are able to provide reliable and valid sociometric data pertaining to their classroom peers. The applicability of a sociometric picture rating scale was assessed by examining its concurrent validity using the Kohn Social Competence Scale, a teacher rating instrument designed to provide an indication of the classroom social behavior of preschool children based on teacher observation. Reliability of the sociometric rating scale was investigated through a test-retest procedure over a six-week interval.

Subjects were thirty-two 3 and 4 year olds (16 male; 16 female) attending public school preschool programs in a rural community in Western Massachusetts. The data obtained included two sets of sociometric scores for each subject (test, retest) as well as scores from the rating scales teachers completed for each subject.

Analysis of the data involved investigation of the strength of association between teacher rating scale scores and sociometric scores, as well as stability of the sociometric scores over the six-week test-retest interval. Additionally, analyses were undertaken to determine if there were statistically significant differences in the sociometric scores due to a subject's age, gender, prior socialization experiences, or Special Education status.

Results indicated fairly good reliability of the sociometric picture rating scale (correlation between the test and retest sets of scores = .71, $p < .01$). Significant relationships were also found between the sociometric scores and those obtained from the teacher rating scale. Therefore, concurrent validity of the sociometric measure was demonstrated.

The only differences of statistical significance found in the sociometric scores were those related to a subject's gender. In this study, females were more likely to receive high sociometric ratings from peers and males were more likely to receive low ratings.

Based on the findings, it was concluded that the picture rating scale technique represents a valid and reliable sociometric measure for preschoolers. It was suggested that sociometrics always be used in conjunction with other measures of social functioning, namely direct observations of behavior or teacher rating scales.

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CHAPTER I

STATEMENT OF THE PROBLEM

In order to place this study in context, it is important to note what is presently happening within the field of Special Education at a federal level. The new Public Law 99-457 constituting the amendments to Public Law 99-142 were signed into effect by the 99th Congress in October 1986. These amendments require all states to extend their Special Education services down to age three by the 1990/91 school year. In present context, this means that by next year, all special needs children between the ages of three and five will be eligible to receive a free and appropriate public education. The law stipulates that a multidisciplinary team comprised of school personnel determine the presence and significance of a delay in one or more areas of the child's development: cognition; speech and language; motor; and social-emotional.

The need for early childhood services mandated by this new law means that school psychologists will be called upon to assess these young children and provide input on what kinds of interventions should be provided for them. For most school psychologists,

this presents a real challenge because they have either never worked with preschool populations or been trained to do so.

Social competency is one aspect of development that is often overlooked or not fully attended to during the assessment process. Often practitioners look to cognitive development (IQ), speech and language functioning, and academic achievement to explain why children are experiencing developmental delays or are not making it within a preschool setting. However, as Rebecca Fewell stated during the NASP Conference on Preschool Assessment (1988), ". . . poor social competency is what causes kids to fail in classrooms, but no one is assessing it or paying much attention to it. There is a desperate need for good methods of assessing the social competency of preschoolers, both the handicapped and non-handicapped." Of course, poor social competency is not the only reason why children experience difficulty within preschool programs. However, it can play a significant role in terms of a child's level of adjustment and adaptation and is one area that is vulnerable to being overlooked in the assessment process.

The importance of social competency has been noted by a number of other professionals in the field. For example, after concluding a study on evaluating early childhood intervention programs, Zigler and Trickett (1978) of Yale University's Child Study Center argued that social competence, rather than IQ, should be the primary measure of the success of intervention efforts with preschool children. When the Head Start Program began in 1965, it had as a primary purpose the development of greater social competence in disadvantaged children with a much lesser focus on academic or cognitive achievements (Anderson & Messick, 1974).

Social competency and more specifically, the development of social skills, have been cited in numerous studies as being extremely important for a child's school adjustment, academic success, peer acceptance, interpersonal relations, overall adjustment, and later functioning in life and society (Berndt, 1983; Eisenberg, Cameron, Tryon, & Dodez, 1981; Gottman, Gonso, & Rasmussen, 1975; Harper & Huie, 1987; Hymel, 1983; Kohn & Rosman, 1974; Ladd, 1983; Wolman, 1982).

Deficits in social competency often hinder normal social and academic development and can have

long-term negative consequences which may serve as precursors to severe problems in adolescence and adulthood (Hightower, Work, Cowen, Lotyczewski, Spinell, Guare, & Rohrbeck, 1986). Gottman and colleagues (1975) cite low peer acceptance and low popularity as having strong positive relationships with suicide, depression, delinquency, and conduct disorder. They suggest that patterns of poor social competency which lead to these types of conditions later in life are traceable back to the early childhood years. A study done by Kohn and Rosman (1974) found that children who are socially well-adjusted tend to learn more, utilize their cognitive processes in more productive ways, and make more gains in cognitive achievement than children who are socially maladjusted, namely those who rate high in apathy and withdrawal.

The problem to be addressed in this study can therefore be stated as two-fold: (a) because of the new federal law, school psychologists will be called upon to assess preschool children often in the absence of any formal training to do so and/or with a lack of previous experience in working with this age group; and (b) given this, school psychologists are in need of specific techniques and measures which can

appropriately assess the developmental functioning of preschool children, particularly in the very important area of social competency.

In regard to social competency assessment, what is needed is not a test, per se, but an instrument capable of identifying a child's social status within a group so that children with low social status receive appropriate intervention in the form of social skills training or more focused social integration experiences.

Purpose of Study

The main purpose of this study was to investigate the degree to which preschool children are able to provide reliable and valid sociometric data pertaining to their classroom peers. The applicability of a sociometric picture rating scale for preschoolers (Asher, Singleton, Tinsley, & Hymel, 1979) was assessed by examining its concurrent validity using the Kohn Social Competence Scale (Kohn & Rosman, 1972), a teacher rating instrument designed to "provide an indication of the preschool child's social competence within the classroom from the point of view of the child's overt behaviors and interpersonal relations" [p.432]. A test-retest

correlation coefficient was obtained on the sociometric scores for a six-week interval.

Additionally, the existing sociometric picture rating scale was informally modified to include post-administration questioning in the re-test condition. After children completed the sociometric task for a second time (re-test), they were asked a series of seven questions pertaining to each peer they just rated. The questions covered seven different domains associated with social behavior and status: sharing; aggression; invitation; compliance; acceptance; reputation; and physical attractiveness.

The purpose of this informal modification was to examine if responses to the post-administration questions were related to the scores obtained from the sociometric picture rating scale and the teacher rating scale of social competence.

Analysis of the data included investigation of the strength of association between the teacher rating scale scores and the sociometric scores, as well as the stability of the sociometric scores over the six-week test-retest interval. Responses to the post-administration questions in the re-test condition were not included in the statistical analyses, as such modification was informal and the

post-administration questions had not been proven valid or reliable.

Significance and Rationale

Clearly, relationships exist between early social functioning and later learning, achievement, and mental health status. Because the tendency to become socially involved with peers first emerges during the preschool period between the ages of 2-1/2 and 4 years (Harper & Huie, 1987), assessing the levels of this emerging social competence is important in terms of identifying any deficits or difficulties children are having in making friends, developing social skills, and in adjusting to the social standards of their particular classroom setting. The assessment of social competency during the preschool years should be of particular interest to school psychologists because of the potential benefit of intervening early in the lives of at-risk children.

Early identification should ultimately lead to early intervention, which exemplifies the spirit of Public Law 99-457. According to McGee and colleagues (1986), "teaching social interaction skills to children must begin early because deficits in social

behaviors are easier to remediate when developmental gaps are smaller" [p.10]. These researchers further purport that socially integrated preschool programs should be a focal point of service delivery because they provide early opportunities to develop peer interaction skills. Preparing the child early to meet and cope with the many demands of social milieus, interpersonal relations, and learning will hopefully alleviate academic, behavioral, and mental health problems down the road.

If young children are able to provide valid and reliable sociometric data pertaining to their classroom peers, school psychologists could use such data not only for assessment of a referred child, but also to identify other children who may be at-risk in their social competence and relatedness. Further, the identification of children with high social status is just as important, particularly in terms of studying their overt classroom behaviors, using them as positive role models in intervention efforts with low-status children, and in understanding what constitutes popular and acceptable behavior unique to the group, its ecology, and individual setting.

A sociometric technique for young children which is capable of adequately providing an indication of

social status within a group constitutes a significant contribution to the area of social competency assessment with preschool aged children.

In the next chapter, a review of the investigations published on the use of sociometric techniques with preschoolers is presented. Issues pertaining to reliability, validity, and the utility of preschool sociometric data are discussed.

Chapter III describes the research methodology of this study including the research design; research questions; the population and sample; instruments used; and procedures employed in the data collection and statistical analyses.

Chapter IV presents the results obtained and answers the main research questions in a sequential and systematic manner.

Chapter V summarizes the study by discussing and evaluating the findings and the limitations of the research design. This chapter further presents conclusions drawn from the results and provides suggestions for future research.

CHAPTER II

REVIEW OF THE LITERATURE

This section involves a review of the investigations published on the use of sociometric techniques with preschool children aged three to five. It presents information on the types of techniques which have been used as well as reliability and validity data that have been obtained. Before proceeding, it is important to clarify that although a substantial body of research is available on sociometry in general, investigations with preschoolers have been limited. The majority of sociometric studies using preschool children has been conducted by a small group of researchers, namely McCandless and Marshall in the late 1950's followed by Hymel and Asher in the late 1970's and to the present. Therefore, their names will appear often in reference to the different studies they have done.

Why and With Whom Sociometry Has Been Used

Developmental psychologists have long held that peers play significant roles in the growth of social, social-cognitive, and cognitive skills (Rubin & Daniels-Beirness, 1983). Piaget believed that peer

interaction was a critical determinant in the development of negotiation skills, cooperation, and the understanding of social rules of compromise and reciprocity (Thomas, 1985). Children as young as the preschool age have been provided social skills training to increase their acceptance by peers (Rubin & Daniels-Beirness, 1983) in an attempt to prevent adolescent and adult outcomes of dysfunctional behavior such as poor academic achievement, learning difficulties, school failure and drop-out, psychopathology, juvenile delinquency, suicide, and other emotional problems.

Sociometric assessment has been used since the early 1930's (e.g., Hagman, 1933; Koch, 1933) to gain an understanding of the dynamics of peer acceptance and rejection within social interactions and settings such as nursery schools, elementary school classrooms, adult education programs, industry, and the armed forces (Marshall, 1957; Moore & Updegraff, 1964). Sociometry is a procedure for measuring the "attraction" between individual members of a specified group (Asher & Hymel, 1981). It is concerned with discovering the preferred relationships which are present in a group at a particular time (Marshall, 1957). Although

sociometric data can provide information about who likes whom and vice versa, it does not, in and of itself, provide an explanation of why the interpersonal dynamics are as they are. Later in this chapter, research pertaining to some of the behavioral correlates of sociometric status will be discussed.

The usefulness of the sociometric score as a measure of social acceptance and interpersonal attraction has been debated and investigated for over 56 years. Sociometric status has been utilized often in social-cognition research based on the assumption that social competency underlies popularity or acceptance among peers (Vaughn & Waters, 1981). Several different types of sociometric measures have been developed, each of which is designed to measure how well individuals are liked or disliked by their peers. As Hymel (1983) points out, there are several advantages to using sociometric measures within a classroom setting.

First, they provide a simple procedure for gathering information on a considerable number of children in a relatively short amount of time. Second, they provide an evaluation of a child's peer relations from the perspective of the peers

themselves, rather than relying solely on outside or external sources of information (e.g., teacher rating scales or behavioral observations) which may be biased due to adult values and expectations about what constitutes appropriate peer relations.

Although Hymel does not state this, it would also seem that because sociometric measures tap peer perceptions and judgments, they may additionally provide important normative data on what children find appealing or not appealing about certain social behaviors in present-day contexts.

Although the majority of sociometric studies have been conducted with elementary school aged children, the preschool group situation may well afford the most extensive opportunity to study the spontaneous social participation of children than can be found for any other age level (Marshall, 1957; Rubin & Hayvren, 1981; Vaughn & Waters, 1980). The less structured atmosphere compared to the elementary school classroom provides preschoolers with ample time for free play and continuous social contact. Indeed, early childhood programs created in response to Public Law 99-457 will most likely be structured as "socially integrated" to include both handicapped and nonhandicapped youngsters. This is particularly

vital in light of the fact that these programs will be primarily servicing children with special needs who stand to benefit from the role models of typical children.

Spontaneous social interaction occurs with high frequency during the early childhood period. Thus, the preschool situation affords a good opportunity to assess emerging levels of social competence so that at-risk children are identified and provided services early. Given this, an investigation of the applicability of sociometric techniques with preschoolers seems a worthwhile endeavor.

The researchers who have conducted the most sociometric studies with preschoolers (e.g., Marshall & McCandless and Asher & Hymel) continued in their investigations over the years because they were convinced that friendships of a reasonably stable and discriminating type exist at the preschool age. They sought to demonstrate that preschool sociometric scores were valid (or useful) in predicting social acceptance by showing that they were related to other measures of social behavior such as observed group relationships or teacher judgments of friendship and popularity (e.g., Asher & Hymel, 1981; Asher, Markell, & Hymel, 1981; Asher, Singleton, Tinsley, &

Hymel, 1979; Marshall, 1957; Marshall & McCandless, 1957; McCandless & Marshall, 1957). Following is a review of the sociometric techniques used by them and by others as well as the findings from a variety of investigations.

Three Sociometric Techniques

The three major types of sociometric techniques which have been employed for use with preschool children are the peer nominations technique, the paired-comparison technique, and peer rating scales.

The peer nominations technique involves asking children to identify a number of peers according to some specified interpersonal criteria (e.g., best friend, especially liked, favorite playmate).

Photographs of peers are usually used with preschoolers so as to simplify the task and to avoid the chance of nominations not being made because of a name not being remembered. Typically, this is done by laying out photos of all classmates on a table at one time. It is assumed that each child searches the array of photos while being questioned in regard to his or her nominations for the specified criteria. This is done in an individual session with each child requiring approximately 5 to 10 minutes. Both

positive and negative sociometric criteria may be used such as, "Name (or point to) 3 kids you especially like" versus "Name (or point to) 3 kids you don't like very much." In both cases, a child's score (unweighted) is simply the number of nominations, either positive or negative, received from peers. Positive nominations received from peers are used to compute acceptance scores, while negative nominations comprise rejection scores (Asher & Hymel, 1981; Hymel, 1983).

Earlier research with preschoolers using the nominations technique involved a weighting of the scores. For example, Dunnington (1957) used a weighted scoring system in which children's first nomination choices were given a weight of 14, second choices a weight of 7, and third choices a weight of 5. A child's sociometric score was then calculated as the total sum of the weighted scores received from peers. Hartup and colleagues (1967) followed a similar procedure.

However, Asher and fellow researchers (1979) found that weighted and unweighted scores were highly correlated. There seemed to be no advantage to the time consuming weighting procedure in calculating a child's score, so a shift toward using unweighted

scores was made (Hymel, 1983). Further, unless explicitly stated in the directions to a child, it could not be assumed that first choices were any more of a "friend" or an "enemy" than later choices. In this regard, weighted acceptance and rejection scores had the tendency to be misleading. However, some researchers (e.g., Vaughn & Waters, 1981) continued to use a weighted scoring method with nomination data. Research with preschool children found that the acceptance (positive nominations) and rejection (negative nominations) scores were only moderately negatively correlated and were therefore probably tapping different aspects of children's peer relations (Hartup, Glazer, & Charlesworth, 1967; Hymel & Asher, 1977; Moore & Updegraff, 1964; Roff, Sells, & Golden, 1972).

Procedures to represent acceptance and rejection scores for nomination data have varied. Gronlund (1959) considered each to be separate indices of social status and calculated and examined them independently. Hartup et al. (1967) created a single status score by subtracting rejection from acceptance scores. Peery (1979) followed a similar procedure and additionally calculated a "social impact score" defined as, "acceptance plus rejection scores."

The second sociometric technique, paired-comparison, involves presenting a child, in turn, with all possible pairs of peers within the classroom. For each pair, the child is asked to state a preference for one or the other according to some specified interpersonal criteria such as, "Which one would you most (or least) like to play with?" As with the nominations technique, photographs of the peers are typically used with preschoolers to simplify the task.

A child's score on this measure is the number of times he or she is chosen by others as the preferred child of the pair. Depending on the criteria used (positive or negative), acceptance or rejection scores may be obtained. The paired-comparison technique ensures equal consideration of all children in the class, as each child must compare each peer with every other peer (Asher & Hymel, 1981; Hymel, 1983). This procedure provides a large number of data points on which to base a child's score (Hymel, 1983), however it also takes a considerable amount of time to administer, approximately 30 minutes per child in an individual session. Lengthy administration may be why the paired-comparison

technique has been used the least in sociometric research with preschool children.

The third type of sociometric technique, peer rating scales, was modified for use with preschool children by Asher and colleagues (1979). In their adaptation, a "picture sociometric rating scale," children are required to rate peers by assigning photographs of classmates to one of three boxes according to specified interpersonal criteria (e.g., "How much would you like to sit by this peer in a group situation?").

On the cover of the boxes is either a happy, neutral, or sad face to represent three Likert-type choice options. The three boxes have a slot in the top so that photos can be placed inside. The assigned values for the sociometric ratings made by placing a photograph inside of a box are: happy face = 3; neutral face = 2; and sad face = 1. Regardless of the interpersonal criteria used, a child's score on this measure is computed as the average rating received from peers (Asher & Hymel, 1981; Hymel, 1983).

According to Hymel (1983), the rating scale technique has several advantages over the other two types of sociometric measures for use with preschool

children. First, each child rates all members of the class, so like the paired-comparison technique, an indication of the child's attitude toward each of his or her classmates is provided. In contrast, on the nominations measure only the child's view of those peers he or she nominates is learned.

Secondly, the rating scale technique yields a sociometric score for a child which is based on ratings received from all class members. This provides a much larger number of data points than would be used in the computation of nomination scores. Although the paired-comparison technique also yields a large number of data points on which to base a child's score, the 30-minute administration time is extreme compared to the 5-minute interview required for the rating scale technique. It would also seem that because the rating scale technique uses concrete visual representations to aid children in making their choices (i.e., the happy, neutral, and sad faces), they might tend to be less confused about what to do and thus understand the nature of the task to a greater degree.

Reliability

Although all three sociometric measures have been employed with preschoolers, only one has been found to be appropriate in terms of reliability, the picture rating scale technique (Asher et al., 1979; Hymel, 1983). The greater reliability of rating scale scores is most likely due to the fact that a child's score is the average rating received from a large number of peers and, as such, a change in the rating given by one or two peers would have relatively little effect. In contrast, on the nominations technique, children typically receive a few positive or negative nominations and the gain or loss of a single nomination per child could have dramatic effects on the distribution of scores (Asher & Hymel, 1981).

The paired-comparison technique has been found to be reliable given that, like the rating scales technique, scores are based on a larger number of data points (Hymel, 1983). However, as already stated, a major drawback of using the paired-comparison technique is that it takes a considerable amount of time (an average of 30 minutes per child). For this reason it has been used the least in preschool research. Even when it has been used

(e.g., Koch, 1933), it was found that preschool children tended to favor the last names in the pair of peers presented to them due to fatigue or loss of interest in the long administration time (Hymel, 1983). Loss of interest and waivering attention during the lengthy administration can affect the reliability of the paired-comparison scores obtained.

Test-retest reliability was quite problematic in early investigations using the nominations technique with preschoolers (e.g., Bronfenbrenner, 1944). In order to deal with this issue of poor stability of nomination scores, McCandless & Marshall (1957) modified the technique to include photographs which children could refer to while making their nominations. Horowitz (1961) carried such a modification further by designing a sociometric task apparatus which displayed the photographs in frames on an upright board. Each frame was connected to an electronic circuit. The child merely touched the frame to make a nomination and his or her response was recorded on a meter.

Despite these modifications, reliability was found to be moderate at best (e.g., .66 over a 10-day period and .45 over a 20-day interval in the McCandless and Marshall study, and .45 over a one-

week period in the Horowitz investigation). Other researchers using the modified, photo nominations technique likewise found only moderate test-retest correlations ranging from .39 to .52 over varying intervals of time (e.g., Asher, Singleton, Tinsley, & Hymel, 1979; Hartup, Glazer, & Charlesworth, 1967; Marshall, 1957; Peery, 1979). Moore & Updegraff (1964) reported the lowest correlation, .33 over a three-week period.

However, test-retest reliability of nomination scores has been found to vary according to the type of score employed (Hymel, 1983). Acceptance scores were found to be more reliable than both rejection scores and "status scores" which are a combination of acceptance and rejection scores (e.g., Asher et al., 1979; Cohen & Van Tassel, 1978; Hartup et al., 1967). Nonetheless, the results of studies conducted with preschool children indicate that the nominations technique does not provide a reliable method of assessing peer status among this age group (Hymel, 1983).

Test-retest reliability data obtained in several studies (e.g., Asher et al., 1979; Cohen & Van Tassel, 1978; Hymel, 1982; Oden & Asher, 1977; Thompson & Powell, 1951; Vaughn & Waters, 1981)

suggest that the paired-comparison and rating scale techniques provide a better estimate of peer acceptance since sociometric preferences of an entire classroom of children, when taken together, help to override individual fluctuations or inconsistencies often apparent in the nominations made for any given child (Asher & Hymel, 1981). As cited previously, the paired-comparison and rating scale techniques have the advantage of a larger number of data points on which to base a child's score.

This larger data base has resulted in findings of higher test-retest reliability coefficients for both paired-comparison scores over nomination scores (Cohen & Van Tassel, 1978; Vaughn & Waters, 1981) and rating scale scores over nomination scores (Asher et al., 1979; Hymel, 1982).

Vaughn and Waters (1981) reported test-retest correlations of .90 for positive criteria paired-comparison scores and .54 for negative criteria scores over three preschool terms. These results are consistent with those already mentioned which found nominations technique "acceptance scores" (based on positive criteria) to be more reliable than "rejection scores" (based on negative criteria). Hymel (1983) believes that acceptance scores ("I

would like to play with") tend to be more stable over time with preschool children because this age group is more consistently sure about who they like ("My best friend") than who they do not like.

Asher and fellow researchers (1979) were the first to modify the rating scale technique specifically for use with preschool children. They used photographs with the three shoe boxes having either a happy, neutral, or sad face on their slotted lids. Using this modification (a "picture rating scale technique"), they found test-retest reliability correlations of .81 for one classroom and .74 for a second classroom over a 4-week period. Such modification proved to be appropriate for use with preschoolers, as the data they obtained was significantly better than that reported in previous studies which utilized the verbal-only method of making nominations (e.g., Oden & Asher, 1977; Singleton & Asher, 1977).

Employing the picture rating scale technique, Hymel (1982) found a test-retest correlation of .83 over a 6-week period for a group of 4-year-olds. Data obtained for a group of 3-year-olds proved to be much less reliable ($r=.33$). These findings, along with other data she had obtained in previous studies,

led Hymel to conclude that, "in regard to reliability, the picture rating scale technique is not only reliable, but is the most reliable of all the sociometric measures for use with children age 4 and older" (Hymel, 1983, p.257).

No study has yet directly compared the test-retest reliability of the rating scale and paired-comparison techniques (they have each been consistently compared to the nominations technique). Again, the paired-comparison technique has seldom been utilized with preschoolers, so little reliability data is available.

Concurrent Validity

In terms of concurrent validity, all three of the sociometric techniques have been shown to be related to observational measures of peer interaction as an index of social competence in preschoolers (e.g., Asher & Hymel, 1981; Dunnington, 1957; Hartup et al., 1967; Hymel, 1983; Marshall & McCandless, 1957; Vaughn & Waters, 1981), and for the nominations and paired-comparison techniques, to teacher ratings of social standing and friendship (e.g., Connolly & Doyle, 1981; Hymel, 1983).

Despite only moderate reliability, nomination scores have been found to be related to social-

cognitive abilities (Peery, 1979); to observed social behavior within the classroom (Dunnington, 1957; Furman & Masters, 1980; Hartup et al., 1967; McCandless & Marshall, 1957; Moore & Updegraff, 1964); to behavior on the playground (Marshall & McCandless, 1957); and to teacher ratings of friendship or popularity (Connolly & Doyle, 1981; Horowitz, 1961; McCandless & Marshall, 1957). Acceptance and rejection scores obtained from the nominations technique tend to be more related to observed social behavior than the status scores (Hartup et al., 1967; Peery, 1979).

There is considerably less data available on the concurrent validity of the paired-comparison technique due to the fact that it has been used less frequently with preschoolers (Hymel, 1983). In reviewing some of the studies which have used paired-comparison measures with 3- and 4-year-olds (e.g., Vaughn & Waters, 1981), researchers have given little attention to the issue of concurrent validity. However, Cohen and Van Tassel (1978) did report that direct observations in their study revealed that the highly preferred children (i.e., those chosen often over another in a pair) were more accepting of peers and of the classroom rule system, while least

preferred children tended to push or pull others, refuse requests, or strike out in aggressive manners.

With preschool children, the concurrent validity of the picture rating scale technique using observational measures has been shown to be superior to that of nomination measures (Asher & Hymel, 1981; Hymel, 1983); it has not yet been compared to the paired-comparison technique (Hymel, 1983). Although few studies have used teacher ratings or judgments as a measure to demonstrate the concurrent validity of traditional rating scale scores, McCandless and Marshall (1957) found preschool sociometric ratings and teacher judgment scores to correlate significantly (.71 with one group and .68 with a second group).

To date, no study has investigated the relationship between the (newer) sociometric picture rating scale and scores obtained from teacher ratings of social behavior.

Hymel (1983) reports that an unpublished study conducted by Hymel, Asher, Tinsley, and Geraci (Note 1) found the picture rating scale scores of preschoolers to be significantly and positively related to the amount of positive peer interaction

observed and significantly and negatively related to the amount of negative peer interaction observed.

In another unpublished study by Hayvren (Note 2) as reported by Hymel (1983), it was found that picture rating scale scores were highly related to the maturity of children's observed play. More highly rated children engaged in less unoccupied behavior, less solitary-functional play, less solitary-exploratory play, more conversations with peers, and more group play than did less highly rated peers. At least in these two studies, picture rating scale scores were found to be related to observed social interaction, thus demonstrating concurrent validity of the rating scale technique with preschoolers based on observational measures.

Predictive Validity

According to Hymel (1983), predictive validity data on preschoolers are not available for any of the three sociometric techniques. Much of the longitudinal research which has studied the relationship between sociometric status and later adjustment and social functioning has been conducted with elementary school-age or adolescent populations (Asher & Hymel, 1981).

Utility of Preschool Sociometric Data

Given that the bulk of evidence on the utility of sociometric techniques has been conducted with older populations, it is important to briefly summarize the findings discussed previously pertaining to reliability and validity, and to consider which applications of these techniques to preschool children are appropriate.

Nomination scores have been the traditional measure of sociometric status for 56 years. When sociometric studies were first performed with preschoolers (e.g., Hagman, 1933; Koch, 1933), nomination techniques were used exclusively, however with no modification for the preschool aged child. Even after modifications were finally made in order to simplify the task (McCandless & Marshall, 1957), findings revealed moderate test-retest correlations at best. Acceptance scores obtained from the nominations technique were consistently found to be more reliable than rejection or status scores. However, the reliability of acceptance scores varied according to the procedures used to tabulate and represent them. This presented both statistical problems and misleading data in some cases.

The paired-comparison technique has been used the least in preschool research primarily because it takes so much time to administer. Reliability tends to be affected by the preschool child tiring during the task.

Ironically, the rating scale technique was not modified for use with preschoolers until 1979, forty-six years after the first preschool sociometric studies and twenty-two years after the modification of the nominations technique, yet it has proved to be the most reliable of all the methods and also highly related to various indices of social competence, particularly those derived from direct observations of behavior.

The picture rating scale technique combines the advantages of a short administration time, a large data base on which to base scores, and the potential to provide a reliable index of peer acceptance and to demonstrate concurrent validity with other measures of social competence such as direct observations.

Therefore, application of the picture rating scale technique to preschool children appears to be appropriate. However, in choosing a sociometric measure for investigating preschool children's peer

relations, the goal of the research being conducted must also be considered (Hymel, 1983).

Sociometric rating scale techniques may provide a reliable index of how well children are "collectively" liked or disliked by their peers; a measure of their overall acceptability or likability within the group (Asher & Hymel, 1981). However, they do not provide enough information about preschool children's peer preferences at a dyadic level and they cannot be used to distinguish between the two groups of low-status children (i.e., the "rejected" and the "neglected," often termed the "social isolates").

Although sociometric rating scale techniques may be valid and reliable for identifying preschool children as at-risk in their peer relations in a general sense, the scores obtained on these measures should be used along with other sources of information such as the data derived from direct observations or teacher and parent rating scales. This would insure that a greater understanding of the behavioral competencies associated with peer acceptance and friendship or social isolation and rejection is achieved. As Hymel (1983) notes, "while it seems important to identify at-risk children from

the perspective of the child's peers, we must be willing to use alternative sources of information in defining the problem and identifying the underlying causes " [p. 257].

Correlates of Sociometric Status

Studies of some of the correlates of sociometric status have found that reciprocal or mutual friendships among preschoolers are more stable over time than are unilateral ones (Gershman & Hayes, 1983). Preschool children who seldom interact with their peers are unlikely to be rated as popular, but are most likely to be identified as "neglected," meaning that they are neither strongly liked or disliked among peers (Berndt, 1983). However, a lower than average level of interactive behavior, in and of itself, is not always indicative of problematic social behavior; the use of total interaction rate as a measure for identifying children as withdrawn and at-risk in their peer relations is not empirically based (Asher, Markell, & Hymel, 1981).

Likewise, while there is abundant evidence that low-accepted children often have few friends within a classroom (Hymel & Asher, 1977; Ladd, 1983; Oden &

Asher, 1977), research does not indicate that unpopular children are necessarily asocial or unable to take part in peer interaction (Asher, Markell, & Hymel, 1981; Dodge, Schlundt, Schocken, & Delugach, 1983).

Rejected children (Dodge et al., 1983) and unpopular children (Putallaz & Gottman, 1981) often are unsuccessful when they try to gain entry into an interacting group of peers and are more likely to be judged by their peers as disagreeable, disruptive, and aggressive. The lack of success experienced by rejected or unpopular children in their attempts to join a group of popular children may also reflect a cohesiveness and "cliquishness" associated with popular children's groups (Ladd, 1983).

Low status group members tend to seek a greater proportion of peer and teacher attention than do high status members, and they tend to reject, to a greater degree, adult stimulation given to them whether solicited or unsolicited (Dunnington, 1957).

Features of the social environment are influential in that sociometric status may depend more on the group the child is in than on his or her individual characteristics per se, and a child's sociometric status may vary as she or he moves to

different groups of classmates, teachers, and classroom structures (Berndt, 1983; Ladd, 1983). Features of the home environment may also be influential. For example, Hetherington, Cox, and Cox (1979) found that when parent-child relationships either improve or deteriorate, corresponding changes in children's sociometric status are likely to occur. Putallaz (1987) found significant relationships between maternal social knowledge and behavior and the child's sociometric status.

The literature on cross-race peer relations indicates that preschool Black and White children tend to accept or like one another as measured by sociometric rating scales (Singleton & Asher, 1977), even though they do not typically nominate each other as best friends or most preferred playmates on nominations measures (Shaw, 1973). The role of socioeconomic level in relation to sociometric status has not been reported in the preschool sociometry literature.

Children's reputation may affect their sociometric status more strongly than their actual behavior, as in the phenomenon of the self-fulfilling prophecy (Cairns, 1983). Differences in the behavior of popular and unpopular children are due partly to

differences in their social skills, but deficits in social skills are not the only source of unpopularity during childhood (Anderson & Messick, 1974; Gottman, Gonso, & Rasmussen, 1975; Rubin & Daniels-Beirness, 1983). Other sources may be related to body type or physical attractiveness (Berndt, 1983; Foster & Ritchey, 1979), and this is especially relevant to the sociometric status of physically handicapped children (Umansky, 1983).

Age and sex are not often related to popularity within preschool groups (Moore & Updegraff, 1964; Peery, 1979), however there is a tendency for older children to give positive ratings to same-sex peers and negative ratings to opposite-sex peers (Criswell, 1939; Hymel & Asher, 1977; Singleton & Asher, 1977).

Lastly, although behavioral correlates of sociometric status provide important information about the characteristics of accepted/liked versus rejected/disliked children, they do not imply causation of behavior (Asher & Hymel, 1981; Cairns, 1983; Hymel, 1983; McKim & Cowen, 1987). More information is needed to describe the process by which social status develops and is maintained. Thus, the need for multiperspective and multimeasure

assessment of social competency in young children is underscored.

Summary and Implications

Characteristics of poor social competency evident during the early childhood years, such as low acceptance among peers and low popularity, have been found to be linked to emotional, academic, and behavioral problems occurring in later childhood, adolescence, and even adulthood (e.g., Gottman et al., 1975; Harper & Huie, 1987). Social competency and social skill development have been cited in numerous studies as being vital to a child's school adjustment, success at learning, peer acceptance, interpersonal relations, overall adjustment, and later functioning in life and society (e.g., Berndt, 1983; Eisenberg et al., 1981; Kohn & Rosman, 1974; Wolman, 1982).

School psychologists need to know how to assess children's level of social competency at an early age in order to identify delays in this very important area of development. Reflecting the spirit of Public Law 99-457, early identification leads to early intervention, thus helping to alleviate social, behavioral, and academic problems down the road.

Because school psychologists will find themselves working with children aged five and younger to a greater degree than ever before, they are in the unique position to learn, and then use, methods for assessing levels of social competency. The preschool group situation may well provide the most extensive opportunity to study the spontaneous social participation of children than can be found for any other age level due to the less structured atmosphere and ample time for free play and continuous social contact which it affords (Marshall, 1957; Rubin & Hayvren, 1981; Vaughn & Waters, 1980).

One way to approach the assessment of social competency in young children is to look at levels of acceptance and popularity within the peer group. Sociometric techniques provide a valuable assessment procedure to this end since they tap the perspectives of the peers themselves. Such a perspective may be quite different from that of the adult and, as such, provides an important source of information for child development research (Hymel, 1983).

As Cairns (1983) notes, sociometric techniques can be powerful when they are employed with meaningful questions and appropriate designs. The modification of the nominations technique (McCandless

& Marshall, 1957) and the peer rating scale (Asher et al., 1979) to include photographs for preschool children to refer to, are good examples of making the sociometric design more appropriate and meaningful for the unique population to be assessed.

None of the sociometric techniques appear to be useful for identifying individual preschool children's peer preferences at a dyadic level. However, collectively, preschool children can provide a reliable estimate of children's peer status, an index which is particularly useful for research and assessment focusing on the quantification or classification of children's peer relations (Asher & Hymel, 1981; Hymel, 1983). In a general sense, sociometric data may also help to identify the main social structures and systems within the classroom peer group (Cairns, 1983), as well as those children who are at-risk in their social relations (Asher & Hymel, 1981).

The most appropriate sociometric technique to use with preschool children is the picture rating scale. It has the advantage of a short administration time requirement and improved test-retest reliability as compared to the paired-comparison and nomination techniques, respectively.

Furthermore, many studies using preschoolers have shown rating scale scores to be more highly related to concurrent measures of social competence than nomination scores.

On the picture rating scale technique, every child in the class is rated by every other child on a dimension which essentially ranges from "most liked or most preferred" to "least liked or least preferred" (i.e., the rating choices of a happy, neutral, or sad face). The large number of data points yielded by this procedure enhances the psychometric reliability of the technique and a relative ranking of each child's likability or popularity within the peer group is obtained.

A review of the literature on sociometry and implications from the studies already conducted with preschoolers points to the need for additional research in this area. The goal of this study was to further such research by investigating the relationship between sociometric scores of preschool children and those obtained from a teacher rating scale of social competence. The stability of the sociometric scores over a six-week period was also tested.

Additionally, an informal examination was undertaken pertaining to how such data were related to responses children gave to questions asked about each peer they rated in the re-test condition of the sociometric task. It was hoped that this questioning procedure would yield information pertaining to some of the behavioral correlates of sociometric status (i.e., characteristics of the children either liked/most preferred or not liked/least preferred within their particular classroom).

Questioning children about their peers following the administration of a picture rating scale task had never been done. Therefore, such a procedure represented an informal modification of the existing picture rating scale technique. Another unique contribution which this study makes to the area of social competency research with preschoolers is the use of a teacher rating scale as a concurrent measure of social competence with the picture rating scale technique.

The next chapter describes the research design of the study including the main research questions; subjects; instruments used; and procedures employed in the data collection and analyses.

CHAPTER III

METHODOLOGY

The main purpose of this study was to investigate the degree to which preschool children are able to provide reliable and valid sociometric data pertaining to their classroom peers.

The applicability of a sociometric picture rating scale for preschoolers (Asher, Singleton, Tinsley, & Hymel, 1979) was assessed by examining its concurrent validity using the Kohn Social Competence Scale (Kohn & Rosman, 1972), a teacher rating instrument. To assess the reliability of the sociometric rating scale, a correlation coefficient was obtained for two sets of scores collected in a six-week test-retest procedure.

A secondary purpose of this study involved informally modifying the existing sociometric picture rating scale by asking subjects a series of seven questions pertaining to each peer they had just rated in the re-test administration of the sociometric task. The questions covered seven different domains associated with social behavior and status: sharing; aggression; invitation; compliance; acceptance; reputation; and physical attractiveness.

The purpose of this informal modification was to examine if responses to the post-administration questions were related to the scores obtained from the sociometric picture rating scale and the teacher rating scale of social competence. However, subjects' responses to the questions were not included in the statistical analyses, as such modification was informal and the questions had not been proven valid or reliable.

Research Questions

The main research questions of this study were as follows:

(1) Is there a statistically significant relationship between the sociometric picture rating scale scores and the teacher rating scale scores from the Kohn Social Competence Scale?

(2) Are the sociometric scores stable over time (i.e., how reliable is the picture rating scale measure)?

(3) What differences are there in the sociometric scores related to subject gender and how significant are these differences?

(4) What differences are there in the sociometric scores related to subject age and how significant are these differences?

(5) What differences are there in the sociometric scores related to subject Special Education status and how significant are these differences?

(6) What differences are there in the sociometric scores related to a subject having had prior socialization experiences such as nursery school or daycare and how significant are such differences?

(7) From an informal examination, are there relationships between the sociometric scores, teacher rating scale scores, and subjects' responses to the seven questions asked in the modified re-test condition of the sociometric task?

Research Design

This was a reliability and validity study of a sociometric picture rating scale for preschoolers (Asher, Singleton, Tinsley, & Hymel, 1979). To demonstrate concurrent validity of the sociometric rating scale, the Kohn Social Competence Scale (Kohn & Rosman, 1972) was used. The Kohn Scale is a

teacher rating instrument designed to provide an indication of the social behavior of preschool children based on teacher observation.

The relationship between the sociometric rating scale scores and those obtained from the Kohn Social Competence Scale was investigated through chi-square analyses and Fisher's exact tests of statistical significance. To gain a measure of the strength of association between the sociometric scores and those derived from the teacher rating scale, Kendall's tau-b was computed on matched sets of scores.

To assess the stability of the sociometric rating scale scores over time, a test-retest procedure was used over a six-week interval. A nonparametric correlation coefficient was obtained using Kendall's tau-b, a measure of rank-order correlation useful in assessing the strength of association between ordinal-level variables.

Differences in the sociometric scores related to gender, age, prior socialization experience, and Special Education status were investigated through a crosstabulation analysis including chi-squares and Fisher's exact test of statistical significance. The variables gender, age, and Special Education status

were additionally subjected to multiple regression analyses in relation to the sociometric rating scale scores.

Subjects' responses to questions asked in the modified re-test condition of the sociometric task were not included in the statistical analyses, as these questions had no proven validity or reliability.

Subjects

Thirty-two children (16 male; 16 female) attending a public school preschool program participated in this study. Preschools were located in a University community and suburban town of Western Massachusetts. Only those subjects for whom parental consent had been obtained participated. Subjects' ages ranged from 3 years, 8 months to 4 years, 10 months with the mean age being 4 years, 3 months. All 32 subjects were Caucasian and English speaking.

Subjects were classified as "over 4 years of age" (n=18) or "under 4 years of age" (n=14). Females comprised 56% of the over-4 group (n=10) and males, 44% (n=8). The under-4 group was 43% female (n=6) and 57% male (n=8). Eleven of the 32 subjects received Special Education services (7 males; 4

females). Eleven of the 32 subjects also entered their preschool program with prior socialization experiences such as nursery school or daycare (8 males; 3 females).

Instruments

Measure of Sociometric Status

To obtain a measure of sociometric status for each subject, a sociometric picture rating scale was used (Asher et al., 1979). This instrument consisted of color, 3x3 photographs of each subject which were regularly used in their preschool classrooms as "visual nametags" (photos were taken with a Polaroid instamatic camera) and three shoe boxes (11x7x2) covered with contact paper, each having either a happy face, a neutral face, or a sad face on their lids (faces were 4x4 circles; blank ink markings hand-drawn on a yellow background). Also on the lid of each shoebox was a slot (4x1) so that the 3x3 color photographs could be placed inside the box.

Subjects were shown the familiar photographs of all subjects other than themselves one at a time and asked, "Do you like to play with him/her here in the classroom?" The location of "here in the classroom" was emphasized, as teachers were instructed to

complete the teacher rating scale based on their observations of each subject within the classroom setting. To respond to the question, subjects placed each photo in the shoe box which represented their rating. The three choice options were explained in advance to each subject as the happy face meaning a definite "yes" or "a lot"; the neutral face, "sometimes" or "not sure"; and the sad face meaning a firm "no" or "never." A tally sheet listing all subjects' names was used to record the numerical values of the sociometric ratings made: happy face = 3; neutral face = 2; sad face = 1.

The individual ratings which a subject received from all other subjects were then summed. Total sums for each subject were then added together to attain one total sum for the entire group. A raw-score formula standard deviation was computed for this group total so that subjects could be assigned a single sociometric score which reflected how their individual summed total compared to the group mean.

To qualify for a single sociometric score of 3, subjects had to have a total sum of ratings which was one or more standard deviations above the group mean. To be assigned a score of 2, their total had to fall within the mid-range, and to receive a single

sociometric score of 1, a subject's total sum of ratings had to be one or more standard deviations below the group mean. These single sociometric scores which subjects were assigned (based on how their summed ratings from all other subjects compared to the group mean) were the scores used in the final statistical analyses. The procedure was the same in the re-test condition.

The ascribed sociometric status for the three different scores were as follows (Asher et al., 1979; Hartup, Glazer, & Charlesworth, 1967): 3 = high status (popular; accepted by peers); 2 = moderate status (neither strongly accepted nor rejected by peers); and, 1 = low status (unpopular; rejected by peers).

Teacher Rating Scale

While direct observation of behavior in a natural setting such as the classroom represents the most desirable type of behavioral assessment procedure (Foster & Ritchey, 1979), a teacher rating scale was selected for use in this research because no study to date has used this type of measure to demonstrate concurrent validity of the sociometric picture rating scale with preschoolers. Thus, the use of a teacher rating scale in this investigation

provides a unique contribution to the body of preschool sociometry research.

When used alone, teacher ratings can provide valid and reliable data pertaining to preschool children's social competence (Connolly & Doyle, 1981). If used in conjunction with a peer-based measure, they provide an independent yet complementary source of information (Asher & Hymel, 1981; Connolly & Doyle, 1981; Hymel, 1983; McKim & Cowen, 1987). With older children, substantial correlations have been found between teacher and sociometric ratings (e.g., McKim & Cowen, 1987). The combination of teacher ratings and sociometric data has been found to offer a valid, reliable index of children's social adjustment in the elementary grades (Berndt, 1983; Connolly & Doyle, 1981; Gronlund, 1959; Hightower et al., 1986).

The Kohn Social Competence Scale (Kohn & Rosman, 1972) was chosen for use in this study because it is specifically designed for preschoolers and has been shown to be a reliable and valid measure of a preschool child's social competence as it reveals itself in the classroom setting (Connolly & Doyle, 1981; Khan & Hoge, 1983; Kohn, 1977; Kohn & Rosman, 1972, 1973, 1974). Satisfactory levels of test-

retest and interrater agreement reliabilites have been demonstrated in previous studies ranging from .79 to .93 (e.g., Connolly & Doyle, 1981; Khan & Hoge, 1983; Kohn, 1977; Kohn & Rosman, 1972, 1973, 1974).

The Kohn scale was developed as a teacher rating instrument to assess overt classroom behavior in terms of the child's interpersonal relations. It consists of 40 items which load onto four factors: interest-participation (IP); cooperation-compliance (CC); apathy-withdrawal (AW); and anger-defiance (AD). The IP and CC factors consist of items indicating curiosity, outgoingness, interest and participation in interpersonal interactions, and willingness to comply with rules and regulations established by the classroom teacher or associated with the structure of games and activities. Items loading onto the IP and CC factors reflect overt behaviors associated with healthy and competent social functioning (Kohn, 1977; Kohn & Rosman, 1972).

The AW (apathy-withdrawal) and AD (anger-defiance) factors consist of items denoting lack of interest in the environment, shyness, absence of interpersonal interaction, disobedience, hostility or aggressiveness, and non-compliance with classroom

rules and regulations. Items which load onto these factors reflect overt behaviors associated with unhealthy and less competent social functioning (Kohn, 1977; Kohn & Rosman, 1972).

According to Kohn & Rosman (1972), the scale's four factors are broad enough to account for an appreciable portion of the variance of social functioning. They purport that such factors are not only replicable across instruments, but that they also manifest stability over time and generality across settings (e.g., Kohn, 1977; Kohn & Rosman, 1972, 1973, 1974).

Khan and Hoge (1983) report that the four factors do have a high degree of generality because similar types of factors have been derived from teacher-judgment data in several studies (e.g., Behar, 1977; Blunden, Spring, & Greenberg, 1974; Lambert & Nicoll, 1977; McDermott, 1981; Quay & Quay, 1965; Ross, Lacey, & Parton, 1965).

Information supporting the construct validity of the Kohn scale has also been presented: Factor analyses of data collected from teachers have confirmed the factor-structure (Kohn & Rosman, 1972, 1973); and scores have been shown to discriminate between clinical groupings of subjects (Kohn &

Rosman, 1973), to relate significantly to alternative teacher-judgment measures (Kohn & Rosman, 1972, 1973), and to correlate highly with observational measures (Connolly & Doyle, 1981; Khan & Hoge, 1983; Kohn, 1977; Kohn & Rosman, 1972, 1973, 1974).

The criterion-related validity of the measure has also been established. The factor scores have been found to be related to indexes of academic achievement (Feshbach, Adelman, & Fuller, 1977; Kohn & Rosman, 1973, 1974; Perry, Guidubaldi, & Kehle, 1979); to levels of social maturity derived from observational data (Khan & Hoge, 1983); to observations of behavior in test situations (Kohn, 1977; Kohn & Rosman, 1973); and to scores from preschool sociometric measures (Connolly & Doyle, 1981; Khan & Hoge, 1983).

In completing the Kohn scale for each child, teachers are instructed to make ratings based on their observations of the child within the classroom setting only (i.e., not on the playground or gym room, etc.). Ratings reflect the degree to which the child does or does not exhibit the stated behaviors along the following continuum: 1 = hardly ever or never; 2 = seldom; 3 = sometimes; 4 = often; and 5 = very often.

The values obtained for each subject are summed and converted to scaled scores which load onto the four factors (IP,CC,AW,AD). Thus, a subject receives a single scaled score in each of four areas assessed by the instrument: interest-participation; cooperation-compliance; apathy-withdrawal; and anger-defiance (Kohn, Parnes, & Rosman, 1979).

Cut-off points are used to determine if a subject's score falls within the high, mid, or low range for any given factor. For the purposes of this study, subjects were assigned a numerical value for each of the four factors to denote where their score fell: 3 = high range; 2 = mid range; and 1 = low range. These values corresponded to those of the sociometric picture rating scale.

Modified Sociometric Task

Unique to this study, the existing sociometric picture rating scale was informally modified for the re-test condition as follows: Immediately after completing the rating scale task for a second time (6-weeks from the initial administration), subjects were re-presented with the photographs one at a time and asked seven questions about each subject they had just finished rating. Response options for the questions were: Yes; Sometimes; No; and I Don't Know.

These were explained to subjects before they began the task. The questions were designed to cover seven different domains of social behavior including sharing, aggression, invitation, compliance, acceptance, reputation, and physical attractiveness.

DOMAIN

QUESTIONS

- Sharing - "Does he/she share things with you?"
- Aggression - "Does he/she play too rough, like hitting, pushing, kicking, or grabbing things?"
- Invitation - "Does he/she ask you to play with him/her?"
- Compliance - "Does he/she follow the rules in a game?"
- Acceptance - "Do you ask him/her to play with you?"
- Reputation - "Does he/she get into trouble with the teachers a lot?"
- Physical
Attractiveness - "Do you like the way he/she looks?"

In formulating the seven post-administration questions, the following research findings were taken into account. In describing their peers, young children focus more on behavioral dimensions which are easily observable and they tend to use more personal and concrete constructs such as, "She gives me things," "He hits me," or "We play together"

(Asher & Hymel, 1981; Asher, Oden, & Gottman, 1977). In contrast, older children are more likely to employ less personal and more abstract constructs in their peer descriptions such as, "She is kind," "He is fair," or "She is intelligent" (Asher & Hymel, 1981).

Thus, a preschool child's reason for liking or not liking a peer will usually be based on concrete constructs involving sharing, physical contact, or mutual interests. There should be much less of the complex or idiosyncratic reasons which are characteristic of older children. The wording of the post-administration questions attempted to be as straightforward, personal, and concrete as possible so as to increase the subjects' understanding. However, it was also understood that the wording of the seven questions necessitated each subject to make an evaluative judgment (e.g., "Do you like the way he or she looks?") which can be a difficult task, particularly for preschoolers.

The seven different domains of social behavior which underlie the questions tap the constructs of sharing, physical contact, and mutual interests. They reflect social behaviors which are concrete and therefore easily observable: sharing; aggression;

invitation; compliance; acceptance; reputation; and physical attractiveness. The use of the seven questions in this study represented an informal procedure; the questions had no proven reliability or validity.

Data Collection and Analysis

Instruments were administered as follows: First, the sociometric picture rating scale was administered within the classroom setting to each subject in an individual session by the researcher, a certified school psychologist with experience in assessing young children; Second, teachers were asked to complete the Kohn Social Competence Scale for each subject (teachers completed their rating scales by the mid-point of the six-week test-retest interval); and Third, the sociometric picture rating scale was administered to each subject within the classroom setting for a second time (six-weeks from the initial administration) in an individual session by the researcher. In the re-test condition, the existing sociometric task was informally modified to include post-administration questioning of each subject.

All subjects were seen within their preschool classroom in a private and unused corner of the room.

The first administration of the sociometric rating scale took approximately 3 minutes per subject. Due to the questioning procedure employed in the second administration, the time requirement doubled. All subjects received a sticker for having participated after both administrations. Teachers were paid twenty dollars for the rating scales they completed.

To limit the effects of examiner bias, the individual ratings a subject received from all other subjects on the sociometric task were summed only after both sets of sociometric data had been collected (test and re-test conditions). For the two separate administrations, total sums for each subject were then added together to attain one total sum for the entire group. Raw-score formula standard deviations were computed for group totals so that subjects could be assigned a single sociometric score which reflected how their individual summed totals compared to the group mean in both the test and re-test conditions.

To qualify for a single sociometric score of 3, subjects had to have a total sum of ratings which was one or more standard deviations above the group mean. To be assigned a score of 2, their total had to fall within the mid-range, and to receive a single

sociometric score of 1, a subject's total sum of ratings had to be one or more standard deviations below the group mean.

The single sociometric scores which subjects were assigned (based on how their summed ratings from all other subjects compared to the group mean) were the scores used in the final statistical analyses. Each subject had two sociometric scores: one from the initial administration (SM1) and one from the re-test administration six-weeks later (SM2).

The ascribed sociometric status for the three different scores were as follows (Asher et al., 1979; Hartup, Glazer, & Charlesworth, 1967): 3 = high status (popular; accepted by peers); 2 = moderate status (neither strongly accepted nor rejected by peers); and, 1 = low status (unpopular; rejected by peers).

The Kohn Social Competence Scales which teachers completed for each subject were received by the mid-point of the six-week test-retest interval, but not scored until after all the sociometric data had been collected. Ratings teachers made reflected the degree to which they observed subjects to exhibit behaviors within the classroom setting along the

following continuum: 1 = hardly ever or never; 2 = seldom; 3 = sometimes; 4 = often; and 5 = very often.

The values obtained for each subject were summed and converted to scaled scores for each of four factors represented in the scale: interest-participation (IP); cooperation-compliance (CC); apathy-withdrawal (AW); and anger-defiance (AD). Cut-off points were used to determine if a subject's score fell within the high, mid, or low range for any given factor (Kohn, Parnes, & Rosman, 1979).

For the purposes of this study, subjects were assigned a numerical value for each of the four factors to denote where their score fell: 3 = high range; 2 = mid range; and 1 = low range. Thus, based on teacher ratings, each subject received a score of 3, 2, or 1 for behaviors loading on four different factors: IP (interest-participation); CC (cooperation-compliance); AW (apathy-withdrawal); and AD (anger-defiance). These weighted values corresponded to those of the sociometric picture rating scale (i.e., 3 being high and 1 being low).

In addition to the two sets of sociometric scores (SM1, SM2) and the teacher rating scale scores (IP, CC, AW, AD), the data set consisted of the

following variables: subject ID code; gender; age (either under- or over-4); prior socialization experience; and Special Education status. Subjects' responses to questions asked in the modified re-test condition of the sociometric task were not included in the statistical analyses, as such modification was informal and the questions had not been proven valid or reliable.

In conducting the data analyses, the Statistical Package for the Social Sciences (SPSS-Update 7-9; Nie & Hull, 1981) was utilized through the computer services at the University of Massachusetts. The statistical analyses included crosstabulation, measures of association, multiple regressions, and tests of statistical significance for all variables in the data set. The following chapter presents the rationale for the statistical analyses performed and the results obtained from such procedures.

CHAPTER IV

RESULTS

This chapter presents the results obtained from statistical analyses of the data and answers the main research questions in a sequential and systematic manner. Both the descriptive and inferential statistics of the study are described.

The variables in this study were as follows: two sets of sociometric scores, test and re-test (SM1,SM2); teacher rating scale scores across four factors (IP:interest-participation; CC:cooperation-compliance; AW:apathy-withdrawal; and AD:anger-defiance); and subject gender, age, Special Education status, and prior socialization experiences. Contingency table (crosstabulation) analyses were performed on all variables because each had the characteristic of being discrete and numeric. Crosstabulation of variables yielded joint frequency distributions of cases by their position on other variables. For example, age by sociometric score or teacher rating scale scores by sociometric ranking.

The joint frequency distributions generated by crosstabulation procedures represented proportions of cases as percentages. These percentages were useful

as descriptive statistics for each variable, however further analysis was required to determine whether differences in variable percentages were statistically significant.

To investigate whether the variables age, gender, Special Education status, and prior socialization experience represented in the crosstabulation frequency distributions were statistically independent of sociometric score variables, chi-square analyses were conducted and subjected to Fisher's exact tests of statistical significance. These statistics indicated whether a systematic relationship existed between given sets of these variables and at what level such relationship was significant. If the variables were statistically independent (no relationship), the differences seen in the crosstabulation percentages were not significant, and vice versa.

To examine the influence which the variables gender, age, and Special Education status had on sociometric scores, multiple regression analyses were conducted. Joint contributions were investigated through combining all three variables in the regression equation. Single contributions of each

variable were investigated through stepwise multiple regression procedures.

For the teacher rating scale variables (IP,CC, AW,AD) and the sociometric scores (SM1,SM2), a measure of association was obtained to indicate how strongly these variables were related to one another. A measure of association representing strength of relationship had to be employed in order to investigate the issue of concurrent validity of the sociometric scale.

Tau-b was the procedure chosen because teacher and sociometric variables were ordinal-level and could be paired for each subject (both sets were on a 3, 2, 1 scale with 3 being high and 1 being low). When a preponderance of pairs ordered in the same direction on both variables (e.g., a subject with a high sociometric score and a high teacher rating score in the cooperation-compliance factor), the final statistic was positive to indicate a positive association between the two variables.

Likewise, when a preponderance of pairs ordered in the opposite direction (e.g., high sociometric scores with low anger-defiance factor scores), the final statistic was negative. The tau-b statistic therefore indicated how strongly variables were

related to one another (via a stated level of significance) by virtue of their association when paired. Levels of significance yielded by the tau-b statistic were based on one-tailed tests because the direction of the relationship between pairs of the variables could be hypothesized prior to the analyses.

To address the issue of reliability of the sociometric picture rating scale (i.e., the stability of sociometric scores over time), a nonparametric correlation coefficient was computed for the scores using the Kendall rank-order correlation procedure. This procedure was chosen because the two sets of sociometric scores (SM1, SM2) were numeric, ordinal rankings classified into a relatively small number of categories (i.e., rankings of 3, 2, and 1).

The Kendall rank-order coefficient was selected for use over Spearman's rho because the two data sets contained a large number of tied ranks. The correlation coefficient yielded by the Kendall procedure indicated the amount of agreement between the two sets of sociometric scores. A test of statistical significance accompanied the correlation coefficient computed.

The main research questions of this study will now be answered based on the results obtained from the statistical analyses just described.

Question 1: Is there a statistically significant relationship between the sociometric picture rating scale scores and the teacher rating scale scores from the Kohn Social Competence Scale? Four factors contained within the Kohn scale were as follows: interest-participation (IP); cooperation-compliance (CC); apathy-withdrawal (AW); and anger-defiance (AD). Items on the Kohn scale loading onto the IP (interest-participation) and CC (cooperation-compliance) factors reflect overt behaviors associated with healthy and competent social functioning; items which load onto the AP (apathy-withdrawal) and AD (anger-defiance) factors reflect overt behaviors associated with unhealthy and less competent social functioning (Kohn, 1977; Kohn & Rosman, 1972).

Tables 1-4 on the following pages present joint frequency distributions generated by crosstabulation analyses. Proportions of cases by their position on the teacher rating scale variables (IP,CC,AW,AD) and sociometric score variables (SM1,SM2) are represented as percentages.

Table 1
Proportions of Cases (N=32) by Their Position
on Teacher Rating Scale Factor IP
and Sociometric Scores (SM1, SM2)

	Interest-Participation (IP)					
	Low		Moderate		High	
	SM1	SM2	SM1	SM2	SM1	SM2
Low Social Status	50%	52%	31%	56%	8%	8%
Moderate Social Status	50%	48%	69%	38%	33%	42%
High Social Status	0%	0%	0%	6%	59%	50%

As can be seen in Table 1, subjects who received ratings of high sociometric status from their peers received predominantly high ratings from teachers on the IP factor and no low ratings. Subjects with low sociometric status received moderate to low ratings from teachers on the IP factor. For the moderate social status group, teacher ratings on the IP factor were distributed more equally across the low, moderate, and high ranges. At least in this study, descriptive statistics revealed that high interest-participation was most associated with high sociometric status.

Table 2

Proportions of Cases (N=32) by Their Position
on Teacher Rating Scale Factor CC
and Sociometric Scores (SM1, SM2)

	Cooperation-Compliance (CC)					
	Low		Moderate		High	
	SM1	SM2	SM1	SM2	SM1	SM2
Low Social Status	75%	100%	38%	54%	0%	7%
Moderate Social Status	25%	0%	62%	39%	53%	46%
High Social Status	0%	0%	0%	7%	47%	47%

The figures represented in Table 2 indicate that subjects who received ratings of high sociometric status from peers also received high ratings from teachers on the CC factor and no low ratings. Subjects with low sociometric status received predominantly low ratings from teachers on the CC factor. Subjects in the moderate status group were rated primarily within moderate to high ranges on the CC factor. In this study, descriptive statistics indicated that high cooperation-compliance was most

associated with high to moderate sociometric status and low cooperation-compliance with low sociometric status.

Table 3

Proportions of Cases (N=32) by Their Position on Teacher Rating Scale Factor AW and Sociometric Scores (SM1,SM2)

	Apathy-Withdrawal (AW)					
	Low		Moderate		High	
	SM1	SM2	SM1	SM2	SM1	SM2
Low Social Status	25%	31%	11%	33%	43%	57%
Moderate Social Status	31%	31%	89%	56%	57%	29%
High Social Status	44%	38%	0%	11%	0%	14%

As can be seen in Table 3, the majority of subjects who received low ratings from teachers on the AW factor received high ratings of sociometric status from their peers. Low sociometric status subjects received predominantly high teacher ratings on the AW factor. For the group of subjects with moderate social status, ratings from teachers on the AW factor generally fell within the moderate range.

In this study, descriptive statistics revealed that low apathy-withdrawal was most associated with high sociometric status.

Table 4

Proportions of Cases (N=32) by Their Position
on Teacher Rating Scale Factor AD
and Sociometric Scores (SM1,SM2)

	Anger-Defiance (AD)					
	Low		Moderate		High	
	SM1	SM2	SM1	SM2	SM1	SM2
Low Social Status	10%	24%	25%	25%	71%	86%
Moderate Social Status	57%	38%	75%	75%	29%	14%
High Social Status	33%	38%	0%	0%	0%	0%

The figures represented in Table 4 indicate that subjects with high sociometric status received low ratings from teachers on the AD factor and no moderate or high ratings. Subjects who were rated highest on the AD factor were those having the lowest sociometric status. Subjects within the moderate sociometric status group received predominantly low to moderate ratings from teachers on the AD factor. At least in this study, low anger-defiance was most

associated with high sociometric status, and high anger-defiance with low sociometric status.

The percentages derived from crosstabulation analyses listed in Tables 1-4 were useful as descriptive statistics for the teacher and sociometric score variables. To determine whether differences in variable percentages were statistically significant, further analyses were conducted. Table 5 presents the results obtained from a tau-b measure of association with one-tailed tests of significance.

Table 5
Relationship Between Sociometric and
Teacher Rating Scale Factor Scores
(N=32)

	Sociometric Scores (SM1)	Sociometric Scores (SM2)
Factor IP	.54**	.42**
Factor CC	.65**	.62**
Factor AW	-.33*	-.23
Factor AD	-.54**	-.48**

** $p < .01$

* $p < .05$

As can be seen in Table 5, positive associations were found between the sociometric scores (SM1,SM2) and the IP and CC factors, indicating a relationship between these variables in the same direction. Such positive correlation suggests that high sociometric scores were related to high scores on the IP and CC factors, and vice versa. The CC factor appeared to be more strongly related to the sociometric scores (.65,.62) than the IP factor (.54,.42), however both of these relationships were highly significant ($p<.01$).

Negative associations were found between the sociometric scores (SM1,SM2) and the AW and AD factors, indicating a relationship between these variables in an opposite direction. Such negative correlation suggests that high sociometric scores were related to low scores on the AW and AD factors, and vice versa. The AD factor appeared to be more strongly related to the sociometric scores (-.54, -.48) than the AW factor (-.33,-.23), and such a relationship of the AD factor to sociometric scores was highly significant ($p<.01$).

Question 2: Are the sociometric scores stable over time (i.e., how reliable is the picture rating scale measure)? The sociometric scores were found to

have an acceptable degree of stability over time. The correlation coefficient computed for the two sets of sociometric scores (SM1,SM2) found the picture rating scale to be a fairly reliable measure with a Kendall rank-order correlation of .71, $p < .01$.

The sociometric status of some subjects shifted over the six-week test-retest interval. However, all such shifts were from one level of sociometric status to another; no subject moved across the two extreme levels (i.e., from high down to low, or from low up to high).

Percentages derived from joint frequency distributions of crosstabulation analyses revealed the following: 86% of subjects attaining high sociometric status in the first administration of the sociometric task maintained this ranking in the re-test condition; 87% of low-status subjects maintained their ranking in the second administration; and for subjects classified as having moderate sociometric status, 60% maintained this ranking in the re-test condition.

Therefore, the most stable scores over time were those associated with high and low status. The greatest degree of fluctuation was seen in the moderate status group with the majority of subjects

shifting to low-status in the second administration and only a few to high-status.

Question 3: What differences are there in the sociometric scores related to subject gender and how significant are these differences? As can be seen in Table 6, in both administrations of the sociometric picture rating scale, females received primarily moderate to high status ratings; males received primarily moderate to low ratings.

Table 6
Sociometric Scores and Subject Gender

	Male n=16	Female n=16
First Sociometric*		
High Status	0%	44%
Moderate Status	62%	44%
Low Status	38%	12%
Second Sociometric**		
High Status	6%	44%
Moderate Status	44%	31%
Low Status	50%	25%

*chi-square (2, N=32) = 9.53, sig = .0085
 **chi-square (2, N=32) = 6.17, sig = .0458

Fisher's exact test of statistical significance for the chi-squares revealed that differences in the first set of sociometric scores were significantly related to subject gender ($p < .01$). In the second administration, the relationship between sociometric scores and subject gender was again found to be significant, however at the .05 level. Thus, the variables gender and sociometric scores were not found to be statistically independent, but rather significantly related to one another. At least in this study, females were more likely to be rated as accepted or popular by peers, whereas males were more likely to be rated as rejected or unpopular, and these differences were statistically significant.

Question 4: What differences are there in the sociometric scores related to subject age and how significant are these differences? As can be seen in Table 7, in the first administration of the sociometric rating scale, the majority of subjects classified as under-4 years of age received moderate and low ratings of sociometric status. In contrast, subjects classified as over-4 received moderate to high ratings. In the second administration, this pattern was repeated for the under-4 group. However, for subjects in the over-4 group, the distribution of

sociometric ratings became more equally distributed across the three rankings.

Table 7
Sociometric Scores and Subject Age

	Under-4 n=14	Over-4 n=18
First Sociometric*		
High Status	14%	28%
Moderate Status	50%	56%
Low Status	36%	16%
Second Sociometric**		
High Status	14%	33%
Moderate Status	50%	28%
Low Status	36%	39%

*chi-square (2, N=32) = 1.84, sig = .398

**chi-square (2, N=32) = 2.20, sig = .333

Fisher's exact test of statistical significance for the chi-squares revealed that differences in both sets of sociometric scores related to subject age were not significant. Thus, the variables age and sociometric scores were found to be statistically independent and therefore not significantly related

to one another. At least in this study, there was no significant relationship between subject age and sociometric status.

The pattern of children classified as under-4 years of age receiving moderate to low status ratings in both administrations of the sociometric rating scale may have been related to the fact that this group was 57% male (n=8) and 43% female (n=6). Because males, in general, tended to receive lower ratings of sociometric status than females, their majority presence in the under-4 group seemingly skewed the distribution of rankings downward.

Question 5: What differences are there in the sociometric scores related to subject Special Education status and how significant are these differences? As can be seen in Table 8, the majority of Special Education subjects received moderate ratings of sociometric status in the first administration of the sociometric task. In the second administration, the distribution changed somewhat. The higher percentage of low status ratings in this condition was due to a few females dropping from moderate to low sociometric status in the second administration.

Table 8
Sociometric Scores and Special Education Status

	Special Education Subjects n=11	All Other Subjects n=21
First Sociometric*		
High Status	9%	29%
Moderate Status	64%	48%
Low Status	27%	23%
Second Sociometric**		
High Status	9%	33%
Moderate Status	36%	38%
Low Status	55%	29%

*chi-square (2, N=32) = 1.64, sig = .441
 **chi-square (2, N=32) = 3.00, sig = .223

There were differences in both sets of the sociometric scores related to subject Special Education status, however such differences were not statistically significant according to Fisher's exact test of the chi-squares. The variables Special Education status and sociometric scores were found to be statistically independent and therefore not significantly related to one another.

Although not statistically significant, subjects having Special Education status in this study were unlikely to receive a high sociometric rating and more likely to be rated as having moderate to low sociometric status.

The pattern of Special Education subjects receiving primarily moderate to low ratings of sociometric status in both the test and re-test conditions may have been related to the fact that this group was 64% male (n=7) and 36% female (n=4). Because males, in general, tended to receive lower ratings of sociometric status than females, their majority presence in the Special Education group seemingly skewed the distribution of rankings downward.

Question 6: What differences are there in the sociometric scores related to a subject having had prior socialization experiences such as nursery school or daycare and how significant are such differences? As can be seen in Table 9, the majority of subjects classified as having had prior socialization experiences received moderate status ratings in the first administration of the sociometric rating scale. In the second administration, the distribution changed somewhat.

The higher percentage of low status ratings in this condition was due to a few females dropping from moderate to low sociometric status in the second administration and a few males attaining higher status over time.

Table 9
Sociometric Scores and Prior Social
Experience Status

	Prior Social Experience Subjects n=11	All Other Subjects n=21
First Sociometric*		
High Status	18%	24%
Moderate Status	55%	52%
Low Status	27%	24%
Second Sociometric**		
High Status	27%	24%
Moderate Status	28%	43%
Low Status	45%	33%

*chi-square (2, N=32) = .146, sig = .929

**chi-square (2, N=32) = .785, sig = .675

Fisher's exact test of statistical significance for the chi-squares revealed that differences in both

sets of sociometric scores related to a subject having had prior socialization experiences were not significant. Thus, the variables prior socialization experience and sociometric scores were found to be statistically independent and therefore not significantly related to one another. At least in this study, there was no significant relationship between prior socialization experiences and sociometric status.

In summary, of the variables gender, age, Special Education status, and prior socialization experience, only one was found to have a statistically significant relationship with both sets of sociometric scores: the variable, gender.

In general, males tended to receive lower ratings of sociometric status than females. Although age and Special Education status were not found to be significantly related to the sociometric scores, there was a definite trend in the data for subjects under the age of 4 and those with Special Education status to receive lower rankings of sociometric status from their peers.

Males comprised the majority of these two groups (i.e., the under-4 and Special Education status), therefore their majority presence seemingly skewed

the distribution of sociometric rankings downward. This suggested a confounding of the variables gender, age, and Special Education status in a relationship that required further investigation.

Multiple regression analyses were performed to first examine the total and overall contribution of the set of variables gender, age, and Special Education status operating jointly on the sociometric scores (SM1,SM2). Table 10 presents the results obtained.

Table 10

Overall Contribution of the Set of Variables
Gender, Age, and Special Education Status
Operating Jointly on the Sociometric
Scores (SM1,SM2)

Multiple Regression Analyses		
	SM1	SM2
Multiple R	.533	.462
R square	.284	.214
F-value	3.708	2.542
Significance of F	.023	.077

N=32

As can be seen in Table 10, the R square value obtained for the first set of sociometric scores (SM1) was .284, indicating that 28 percent of the variation in these scores was accounted for by gender, age, and Special Education status operating jointly. The multiple R of .533 indicates a moderately strong and positive relationship between the variables. The F-value with a significance of .023 indicates that the combined influence of gender, age, and Special Education status on the sociometric scores (SM1) was statistically significant ($p < .05$).

The R square value obtained for the second set of sociometric scores (SM2) was .214, indicating that 21 percent of the variation in these scores was accounted for by gender, age, and Special Education status operating jointly. The multiple R of .462 indicates a moderately strong and positive relationship between the variables. The F-value with a significance of .077 indicates that the combined influence of gender, age, and Special Education status on the sociometric scores (SM2) was not of strong statistical significance and was less significant compared to the first set of sociometric scores (SM1).

The variables gender, age, and Special Education status were next singled-out so that each of their relationships to the sociometric scores (SM1, SM2) could be examined. Table 11 shows that of the three, gender had the strongest relationship with both sets of sociometric scores, $r=.50$ for SM1 and $r=.40$ for SM2.

Table 11

Correlation of Gender, Age,
Special Education Status, and
Sociometric Scores (SM1, SM2)

	SM1	SM2	Gender	Age
Gender	.50	.40		
Age	.24	.10	.13	
Special Education Status	.16	.31	.20	.16

N=32

Interestingly, of the three variables, gender and age were more strongly correlated with the first set of sociometric scores (SM1). However for the second set of scores which were obtained six-weeks later (SM2), age showed a weaker relationship and gender and Special Education status became the more significant variables (also see Table 12).

Table 12

Significance of the Correlation of
Gender, Age, and Special Education Status
With Sociometric Scores (SM1,SM2)

SM1			
	<u>B</u>	<u>T</u>	<u>Sig of T</u>
Gender	.648	2.889	.007
Age	.235	1.046	.304
Special Education Status	.056	.237	.814

SM2			
	<u>B</u>	<u>T</u>	<u>Sig of T</u>
Gender	.549	2.049	.050
Special Education Status	.382	1.350	.188
Age	.031	.116	.908

N=32

As depicted in Table 11, the relationship between gender and Special Education status ($r=.20$) was stronger than the age-gender ($r=.13$) and age-Special Education status ($r=.16$) relationships because the Special Education group was comprised of 7 males and 4 females, a more uneven distribution than was characteristic of the other two.

To examine the total and overall contribution of each of the variables gender, age, and Special

Education status operating singly on the sociometric scores (SM1,SM2), further multiple regression analyses were performed. Table 13 presents the results obtained from regressing each of the variables one at a time and by itself (gender, age, and Special Education status) on each set of sociometric scores (SM1,SM2).

Table 13

Overall Contribution of Each of the Variables
Gender, Age, and Special Education Status
Operating Singly on the Sociometric Scores
(SM1,SM2)

Multiple Regression Analyses		
	<u>SM1</u>	<u>SM2</u>
GENDER		
Multiple R	.503	.400
R square	.253	.160
F-value	10.140	5.725
Significance of F	.003	.023
AGE		
Multiple R	.236	.100
R square	.056	.010
F-value	1.769	.308
Significance of F	.193	.583
SPECIAL EDUCATION STATUS		
Multiple R	.159	.306
R square	.025	.093
F-value	.781	3.089
Significance of F	.384	.089

N=32

As can be seen in Table 13, the variable gender operating singly on the sociometric scores (SM1,SM2) had a greater degree of total influence than did the variables age or Special Education status. Such

findings confirm that in this study, the variable gender was indeed the only variable to exhibit a statistically significant relationship with the two sets of sociometric scores.

As presented in Table 10, the combined influence of the three variables gender, age, and Special Education status operating jointly accounted for 28 percent of the variation in the first set of sociometric scores (SM1) and 21 percent in the second set (SM2). As the R square values in Table 13 reveal, the variable gender, by itself, accounted for 25 percent of the variation in SM1 and 16 percent in SM2.

The R square values for age and Special Education status indicate that each of these variables provided only very small incremental contributions in relation to both SM1 and SM2. Their multiple R values indicate modest to weak relationships with the sociometric scores and no level of statistical significance.

In contrast, the multiple R's for the variable gender (see also Table 11) indicate positive and moderately strong relationships to both sets of sociometric scores (.50 for SM1 and .40 for SM2). The significance of the F-value indicates that the

influence of gender alone on the sociometric scores was statistically significant (for SM1, $p < .01$ and for SM2, $p < .05$).

A final multiple regression analysis was performed in which the contribution of a single variable over and above the other two to the sociometric scores was tested. This method involved first testing the contribution of gender over age and Special Education status; secondly testing age over gender and Special Education status; and finally testing Special Education status over gender and age. Table 14 presents the results obtained.

Table 14
Contributions of Single Variables Over
and Above Other Variables to the
Sociometric Scores (SM1, SM2)

Multiple Regression Analyses				
	SM1		SM2	
	<u>F</u>	<u>Sig of F</u>	<u>F</u>	<u>Sig of F</u>
Gender over	8.347	.007	4.197	.050
Age & SPED*	.621	.544	.958	.396
Age over	1.095	.304	.014	.908
Gender & SPED	4.473	.021	3.631	.039
SPED over	.056	.814	1.823	.188
Gender & Age	5.066	.013	2.150	.135

N=32

*SPED=Special Education Status

As Table 14 shows, gender was the only variable found to have levels of statistical significance when forced through the regression equation first. Neither age nor Special Education status (SPED) reached levels of statistical significance when tested for their degree of contribution to the sociometric scores over and above the two other variables. Through this analysis, gender was again found to be the only variable having a statistically

significant relationship with both sets of sociometric scores (SM1,SM2).

Question 7: From an informal examination, are there relationships between the sociometric scores, teacher rating scale scores, and subjects' responses to the seven questions asked in the modified re-test condition of the sociometric task? This question was not addressed through statistical analyses since the modification undertaken was informal and the seven questions had no proven reliability or validity. Findings from informal examination of subjects' responses will be discussed briefly.

It was hoped that the procedure of asking subjects questions about the peers they had rated would yield information pertaining to some of the behavioral correlates of sociometric status (i.e., characteristics of the subjects rated as either most liked/preferred or not liked/least preferred).

The seven questions which subjects were asked are presented next. Each question was based on a different domain of social behavior: sharing; aggression; invitation; compliance; acceptance; reputation; and physical attractiveness.

DOMAINQUESTIONS

- Sharing - "Does he/she share things with you?"
- Aggression - "Does he/she play too rough, like hitting, pushing, kicking, or grabbing things?"
- Invitation - "Does he/she ask you to play with him/her?"
- Compliance - "Does he/she follow the rules in a game?"
- Acceptance - "Do you ask him/her to play with you?"
- Reputation - "Does he/she get into trouble with the teachers a lot?"
- Physical
Attractiveness - "Do you like the way he/she looks?"

As could be expected, it was found that subjects who had received high sociometric status ratings from their peers likewise tended to receive many positive ("yes") responses to the questions related to sharing, compliance, and acceptance. In contrast, these high status subjects received few to no positive responses for the aggression and reputation questions.

Subjects who had received low status ratings from peers, in turn, received an overwhelming number of positive ("yes") responses to the question related to aggression, and to a lesser degree, reputation. These low status children also tended to receive

fewer positive responses for the sharing, compliance, and acceptance questions relative to higher status peers.

There seemed to be no real pattern in responses subjects made to the questions covering the "invitation" and "physical attractiveness" domains. The frequency of positive ("yes") and negative ("no") responses was distributed fairly equally across the sociometric status rankings.

Perhaps the most striking finding from informal examination of this data was the relationship between teacher rating scale scores and subjects' responses to the seven questions. High teacher ratings on the cooperation-compliance (CC) and interest-participation (IP) factors correlated greatly with positive ("yes") responses subjects gave to the questions concerning compliance and sharing. At least in this study, subjects and teachers seemed to agree in their recognition of positive social behaviors related to following the rules and sharing.

Similarly, high teacher ratings on the anger-defiance (AD) factor correlated greatly with positive ("yes") responses subjects gave to the question concerning aggression. This suggests that teachers

and subjects had a high level of agreement in their recognition of negative social behaviors related to hitting, kicking, grabbing, or playing too rough.

CHAPTER V

CONCLUSIONS AND DISCUSSION

This chapter summarizes the study by reviewing its design and rationale; evaluating its findings in the context of previous studies; and discussing the limitations of the research methods employed. This chapter further presents conclusions drawn from the results and provides suggestions for future research.

Rationale of Study

The rationale for this study was based on the the fact that characteristics of poor social competency evident during the early childhood years, such as low acceptance among peers and low popularity, have been found to be linked to emotional, academic, and behavioral problems occurring in later childhood, adolescence, and even adulthood (e.g., Gottman et al., 1975; Harper & Huie, 1987). Social competency and social skill development have been cited in numerous studies as being vital to a child's school adjustment, success at learning, peer acceptance, interpersonal relations, overall adjustment, and later functioning

in life and society (e.g., Berndt, 1983; Eisenberg et al., 1981; Kohn & Rosman, 1974; Wolman, 1982).

The foundation of Public Law 99-457 is early identification of special needs based on the assumption that early intervention helps to alleviate a confounding of problems later in life. The assessment of social competency during the preschool years should be of particular interest to school psychologists because of the potential benefit of intervening early in the lives of high- or at-risk children.

One way to approach the assessment of social competency in young children is to look at levels of acceptance and popularity within the peer group. Sociometric techniques provide a valuable assessment procedure to this end since they tap the perspectives of the peers themselves. Such a perspective may be quite different from that of the adult and, as such, provides an important source of information for child development research (Hymel, 1983).

Design of Study

In this study, the applicability of a sociometric picture rating scale (Asher et al., 1979) was assessed using a sample of thirty-two preschool

children, ages three and four. In order to investigate the concurrent validity of the sociometric measure, teachers were asked to complete a rating scale for each subject. The Kohn Social Competence Scale (Kohn & Rosman, 1972) was used because it is specifically designed for preschool children and is capable of providing a reliable and valid index of children's social behavior within a classroom setting based on teacher observation. Examination of the relationship between the teacher rating scale scores and those obtained from subjects using the sociometric picture rating scale constituted the main focus of this study.

The reliability of the sociometric rating scale was examined through a test-retest procedure over a six-week interval. In the second administration of the sociometric task, the technique was informally modified by asking each subject a series of seven questions pertaining to every other subject they had rated. It was hoped that such modification would yield information related to some of the behavioral correlates of sociometric status (i.e., characteristics of the subjects rated as most liked/preferred or not liked/least preferred).

An informal examination was undertaken to determine how such data were related to the scores obtained from both the teacher and sociometric rating scales. Statistical analyses were not performed for this examination because the seven questions had not been proven valid or reliable.

Characteristics of subjects such as gender, age, prior socialization experiences, and Special Education status were included in the data set and analyzed to determine if their relationship with, and contribution to the sociometric scores was of statistical significance.

A unique contribution which this study made to the body of preschool sociometric research was the use of a teacher rating scale as a concurrent measure of social functioning. To date, published studies have employed observational measures or teacher ratings of popularity to demonstrate concurrent validity of preschool sociometric measures. No study has used the picture rating scale technique in combination with a teacher rating scale of social behavior.

Discussion of Findings

A variety of analyses were performed on the data obtained in this study, yielding both descriptive and inferential statistics (e.g., see Tables 1-14). Results drawn from statistical analyses revealed the following. In regard to the stability of sociometric scores over time (i.e., the six-week interval), a test-retest reliability coefficient of .71 ($p < .01$) was found. The most stable sociometric rankings over time were the high status and low status. There was more fluctuation within the moderate status group with some subjects shifting to low status and a few to high status in the second administration. All shifts that occurred involved movement from one level of sociometric status to another. No subject shifted across the two extreme levels (i.e., from high down to low or from low up to high).

Correlation of .71 ($p < .01$) for the two sets of sociometric scores indicates that in this study, the sociometric picture rating scale was found to be a fairly reliable measure with three and four year olds over the six-week interval. Similar correlations have been obtained for the picture rating scale by Asher and colleagues (1979), .81 and .74 over a four-week period, and by Hymel (1982), .83 over a six-week

interval for four year olds and .33 for three year olds. Stability of the sociometric scores over time for subjects age 4 and over versus subjects under the age of 4 was not examined in this study.

In regard to concurrent validity of the sociometric rating scale, statistically significant correlations were found between both sets of sociometric scores, SM1 (test) and SM2 (retest), and those obtained across four factors of the Kohn teacher rating scale: cooperation-compliance (.65,.62); interest-participation (.54,.42); apathy-withdrawal (-.33,-.23); and anger-defiance (-.54,-.48). McCandless and Marshall (1957) found similar correlations using different but parallel instruments: the traditional rating scale approach and teacher judgments of friendship (.61,.58 across two groups).

Of the four factors on the Kohn teacher rating scale, the two having the strongest correlations with the sociometric scores (SM1 and SM2) were the cooperation-compliance factor (.65 and .62, $p < .01$) and the anger-defiance factor (-.54 and -.48, $p < .01$).

High teacher ratings in cooperation-compliance were most associated with high and moderate sociometric ratings from peers. Low cooperation-

compliance ratings from teachers were most associated with low sociometric ratings from peers.

High teacher ratings in anger-defiance were most associated with low sociometric status. Conversely, low ratings from teachers in anger-defiance were most associated with high sociometric status.

A similar pattern was also seen in the responses subjects gave to the seven questions asked in the modified re-test condition of the sociometric task. Informal examination of the data revealed that subjects with higher sociometric status were more likely to receive positive responses from their peers on questions related to sharing, acceptance, and compliance. Lower status subjects were more likely to receive positive responses in relation to the question concerning aggression.

These findings are similar to those obtained in a study conducted with Kindergarten and first-grade children (Rubin and Daniels-Beirness, 1983) which found popular/accepted children to evince more prosocial and cooperative behaviors and fewer aggressive or negative peer interactional behaviors than their less popular age-mates.

In regard to the other two factors of the teacher rating scale, interest-participation (IP) and

apathy-withdrawal (AW), their correlation to both sets of sociometric scores was statistically significant, however not as strong as the CC and AD factor scores. High ratings from teachers in interest-participation were most associated with high ratings of sociometric status from peers. Likewise, low ratings from teachers in apathy-withdrawal were most associated with high ratings of sociometric status from peers.

Based on the findings of this study it can be concluded that higher rankings of sociometric status were significantly related to higher levels of cooperation-compliance and lower levels of anger-defiance. An inverse relationship was seen for low status subjects; higher ratings in anger-defiance and lower ratings in cooperation-compliance characterized this group.

In regard to differences in the sociometric scores due to a subject's age, gender, prior socialization experiences, or Special Education status, only one of these variables was found to have statistical significance: Gender. There were trends in the data for younger subjects and those with Special Education status to receive lower ratings of sociometric status from their peers. However,

statistical analyses revealed that such trends were of no significance. The only variable found to be significantly related to the sociometric scores was gender.

Findings of no significance for the Special Education and prior socialization experience variables may have been related, in part, to the small number of subjects comprising each of these subgroups (n=11) and the small number of total subjects (N=32).

The finding that a subject's Special Education status was not significantly related to his or her sociometric status might reflect that younger children are less prejudice or aware of "labels" and have a higher degree of tolerance and acceptance related to personal differences and handicaps.

In regard to subject age, an absence of age effects was also found in a study of three and four year olds conducted by Kohn and Rosman (1972). However, Hymel (1982) reported differences in sociometric status due to age; three year olds were found to have lower sociometric ratings than four year olds. Such was the case in this study as well, however the trend of subjects under the age of four

receiving lower ratings of sociometric status was found to have no statistical significance.

In terms of gender being the most significant variable in this study, females were more likely to be rated as accepted/popular by peers (high sociometric status) and males were more likely to be rated as rejected/unpopular (low sociometric status). The high status group was predominantly female and the low status group was predominantly male.

Females received a greater number of high ratings on the CC factor of the teacher rating scale compared to males and males received a greater number of high ratings on the AD factor compared to females.

A similar pattern was seen in subjects' responses to the questions asked in the second administration of the sociometric task. Females received more positive ("yes") responses to questions about prosocial/acceptable behaviors and males received more positive ("yes") responses to questions about less social/unacceptable behaviors.

Whiting and Edwards (1988) purport that more emphasis is placed on socializing girls early for prosocial involvement than is placed on boys, and this is true in many different cultures. At the preschool level, girls tend to mature faster and are

often more verbal than are boys who tend to communicate to a greater degree through non-verbal actions.

It has been found that teachers are more likely to value and react positively to high levels of compliant prosocial behaviors, and that such reaction shapes the opinions children have of one another's behavior within the classroom (Eisenberg, Cameron, Tryon, & Dodez, 1981). In this study, both subjects and teachers seemed to have agreement in their recognition of compliant and cooperative behavior. Based on the sociometric ratings made, subjects who rated high in cooperation-compliance tended to have higher sociometric status, indicating some degree of association between such behavior and peer acceptance within the group.

Subjects and teachers also seemed to agree in their recognition of aggressive and defiant behavior. Based on the sociometric ratings made, subjects who rated high in anger-defiance tended to have lower sociometric status, indicating some degree of association between such behavior and peer acceptance within the group.

Special considerations associated with sociometric research in general will now be discussed

as they pertain to this study. When making sociometric ratings, elementary school children tend to exhibit bias against opposite-sex peers in that positive ratings are given to same-sex peers and negative ratings to opposite-sex peers (Hymel & Asher, 1977; Singleton & Asher, 1977). Such bias was not found to be the case in the present investigation. An equal number of males and females participated in this study, and while the high status group was predominantly female and the low status group predominantly male, an examination of the tally sheet listing subjects' ratings revealed no evidence of a sex-bias trend.

Noted to be an issue in sociometric research, differentiation between "rejected" and "neglected" children (those thought to collectively comprise the low status group) was problematic in this study. Low status subjects could be more clearly classified as "rejected" than as "neglected." The identification of "rejected" subjects in the low status group was easier for two reasons.

First, the majority of low status subjects received individual ratings of 1 from all other subjects. Thus, when their total sum of ratings was compared to that of the group mean, there was little

doubt that they fell one standard deviation below the mean. By giving a rating of 1, other subjects were clearly rejecting a low status subject as a playmate preference (i.e., the rating of 1 meant a firm "no" or "never" in response to the question, "Do you like to play with him/her here in the classroom?"). Had a subject been undecided or not sure about his/her rating (e.g., in the case of a "neglected" peer), the neutral face with an assigned value of 2 was the option used.

Secondly, the majority of low status subjects received primarily high ratings from teachers on the two factors denoting less healthy and less competent social functioning (namely, the anger-defiance factor) and more positive responses to the question related to aggression when compared to the moderate and high status subjects.

Thus, the "rejected" subjects comprised the majority of the low status group and ranked highest in aggressive and angry-defiant behaviors. The majority of subjects whom could be classified as "neglected" seemingly ended up in the middle, moderate status group, although this was not formally examined. It can be concluded, however, that in this study, the low status group was not collectively

comprised of both "rejected" and "neglected" subjects, but rather was represented overwhelmingly by the "rejected."

Implications of Findings for Intervention

Subjects who are low status and "rejected" by their peers in terms of sociometric ratings made should be considered prime candidates for intervention services. Research has found that there is moderate to high stability over periods ranging from 5 to 8 years among children classified as "rejected" by their peers (Cairns, 1983; Coie & Dodge, 1983). The effects of the self-fulfilling prophecy are well known and the reputation a child develops can affect sociometric status more than actual behavior (Cairns, 1983).

In this study, the "rejected" or low status group of subjects was characterized by high ratings in anger-defiance by teachers and in aggression by peers. Children rating high on the anger-defiance factor at the preschool age have been found to later exhibit problems in the elementary grades including academic deficit, underachievement, and social-emotional difficulties (Kohn, 1977; Kohn & Rosman, 1974).

Also considered at-risk are children who exhibit withdrawn and apathetic behavior regardless of their sociometric standing within the group. Most of the high AW subjects in this study received moderate ratings of sociometric status from their peers, perhaps because all subjects were instructed to choose the neutral face option with an assigned value of 2 if they were "not sure" or only liked to play with the peer "sometimes." These high AW subjects were most likely the "neglected" within the group, although this was not formally examined.

In preschool and elementary aged children, apathetic and withdrawn behavioral tendencies have been found to be associated with low frequency of peer interaction, lack of trust in the environment, greater dependency on mother, and underlying states of depression and sadness (Kohn & Parnes, 1974). Researchers have similarly found relationships between apathy-withdrawal and academic deficits, poor cognitive functioning, low achievement, and passivity in learning (Kohn, 1977; Kohn & Parnes, 1974; Kohn & Rosman, 1974).

Apart from children who are actively rejected by peers or who exhibit withdrawn and apathetic behaviors, identification of children with high

social status is just as important. Popular children can be used as positive role models in intervention efforts with low-status children. By observing the overt classroom behaviors of high-status children, information can be gained concerning what constitutes popular and acceptable behavior unique to the group, its ecology, and individual setting.

Limitations of Study

A limitation of this study, one shared by sociometry in general, was that the picture rating scale technique provided a reliable index of how well subjects were collectively liked or disliked by their peers, a measure of their overall acceptability or likability within the group, but it did not provide enough information about peer preferences at a dyadic level. The distinction between likability and friendship is an important one, as even children who are not well liked within a group may still have "friends." Further, research with preschoolers has found that mutual relationships or friendships are more stable over time than are unilateral ones (Gershman & Hayes, 1983).

A second limitation of this study was the scoring method used with the sociometric scores.

Between the two sets (SM1,SM2), there were a large number of tied ranks across the three sociometric levels (high, moderate, and low). Calculation of z-scores would have made it possible to differentiate between fluctuations within each level. For example, within the high status group which was comprised of those subjects whose total summed score fell one standard deviation above the group mean; within the moderate status group comprised of subjects having a total score which fell within the mid-range; and within the low status group which was comprised of those subjects whose total summed score fell one standard deviation below the group mean.

Another limitation of this study was the small number of total subjects (N=32) as well as the small number of subjects comprising the subgroups Special Education status and prior socialization experience (n=11 in each). A larger sample would have provided a more sufficient data base on which to test the research questions.

A more diverse population would have enriched the study, as all subjects were Caucasian, English-speaking, and from a relatively suburban community in Western Massachusetts. The socioeconomic range for subjects was somewhat restricted; the majority were

from middle-class backgrounds. Opportunities for cross-race, cross-cultural, and SES level comparisons were therefore missed.

The use of a teacher rating scale in this study as a measure of concurrent validity for the sociometric picture rating scale represented a new contribution to the body of preschool sociometric research. The combination of teacher and peer ratings has been found to offer a reliable and valid index of children's early social adjustment and functioning (McKim & Cowen, 1987). However, the use of a teacher rating scale, in and of itself, presented a limitation to the design of this study because teacher ratings, in general, are subject to problems of reliability and response bias (e.g., Glow, Glow, & Rump, 1982; King & Young, 1982; Umansky, 1983).

Further, because teachers completed a social behavior rating scale for each subject in between the two administrations of the sociometric task, they may have come to react differently to subjects based on the ratings they made. In a classroom setting, teacher reactions can shape the opinions children have of one another (Eisenberg, Cameron, Tryon, & Dodez, 1981), and in this sense, the sociometric

status of subjects in the retest condition could have been affected if there were changes in teacher behavior during the six weeks that separated the two administrations of the sociometric task.

Suggestions for Future Research

The fact that this study had conclusive findings makes it a good candidate for replication with larger and more diverse preschool samples. Because no study to date has examined the predictive validity of preschool sociometric data (Hymel, 1983), this type of research as an extension-study would be a worthwhile endeavor.

To further explore the concurrent validity of the sociometric picture rating scale, additional sources of data pertaining to children's social functioning could be used, namely those derived from observational measures.

Suggestions for modification of the present study include administering the sociometric task to teachers in order to compare their ratings to those made by the children; obtaining interrater agreement reliabilities for teacher rating scales that are used; calculating z-scores for the three levels of sociometric scores; examining the stability of

sociometric scores according to age to yield reliability data based on age; and subjecting the questioning procedure used in the modified retest condition to tests of validity and reliability.

In order to make the questioning procedure more concrete and understandable for preschoolers, photos or pictures could be used in conjunction with the questions to illustrate their meaning and the seven dimensions of social behavior they tap (e.g., illustrations which portray acts of aggression, sharing, or cooperation).

To explore issues related to the mutuality of relationships and the friendship networks operating within a classroom environment, it is recommended that in future studies "reciprocity" be incorporated as a variable. Although the sociometric picture rating scale is designed to yield general indications of a child's social standing within a specified group, including a measure of reciprocity in ratings might make it a more powerful instrument.

In summary, the sociometric picture rating scale investigated in this study was found to have applicability with the preschool children who participated. As a sociometric technique, it was found to provide a reliable and useful index of

acceptance and popularity within the peer groups studied. The picture rating scale is easily conducted with preschoolers and as such provides an inexpensive and efficient method of obtaining relevant data. However, as with all sociometric instruments, additional sources of information must be used in conjunction with the picture rating scale in order to identify the competencies that lead to peer acceptance and popularity and the deficits which lead to social isolation and rejection.

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