**The Relationship Between Social Networks
and Sociometric Status in Children**

by

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the Faculty of Graduate Studies and Research
in partial fulfillment of
the requirements for the degree of
Master of Arts**

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Abstract

The purpose of this study was to examine the relationship between children's peer groups and children's social status. Of particular interest were low-accepted children. A total of 392 students in Grades 4-6 and their teachers participated in this study. Students completed sociometric nominations and a measure of their peer groups. This measure assessed both how salient individual children were within their group (individual centrality) and how high profile their groups were within the larger social network (group centrality). Teachers completed a behavioural assessment of the students. Overall, individual centrality was related to social status while group centrality was not. Furthermore, when the analyses were broken down by sociometric status, results indicated that rejected (but not neglected) children were less likely to belong to a group than expected. Limitations and future directions for research were discussed.

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The Relationship Between Sociometric Status and Social Networks in Children

While young children rely on their parents and family for socialization (Hartup, 1979), older children and adolescents rely increasingly on their peers for input into their daily activities and behaviours (Adler & Adler, 1998). In fact, researchers have found that peers are a fundamentally important aspect of the lives of children and adolescents. Peers provide direct instruction on how to behave (Hartup, 1979), provide feedback with respect to social skills and social competence (Asher, 1978), offer protection and support from bullying (Olweus, 1993; Rigby, 1998), and fulfil a basic need for interpersonal intimacy (Newcomb & Bagwell, 1996). Essentially, peers help children learn what is acceptable behaviour and what is not and often provide support when it is required.

Given the importance of peers, many researchers have studied the relationships that children have with their peers (Cairns, Perrin & Cairns, 1985; Parker & Asher, 1993). Peer relationships exist on a number of different levels: dyadic friendships, small social groups, and larger social networks. Studies of dyadic peer friendships provide researchers insight into what such a relationship provides to its members and allow researchers to gain a better understanding of the influence and impact that friends have on each other. Researchers who have studied small and larger social groups have done so to understand the different social positions individual children hold within their peer groups (Farmer & Cairns, 1991; Xie, Cairns & Cairns, 1999). Children of differing positions within the peer group may exert more or less influence over their peers than children in other group positions. Finally, researchers who have studied children's perceptions of peers have done so to learn more about why some children are liked while others are disliked (Coie, Dodge & Coppotelli, 1982).

While much research has focused on the dyadic peer relationship (Parker & Asher, 1993), less research has focused on the dynamics of the larger peer group (Cairns et al., 1985). To provide information pertaining to the peer group, researchers have developed a number of different techniques. One such technique is the mapping of children's social networks within their grade (Cairns et al., 1985). This Social Cognitive Map (SCM) procedure enables researchers to identify the peers children affiliate with. This technique also allows researchers to determine the degree of centrality (or salience) of each group and each child within each group.

Unfortunately, social network research does not provide information about the status of individual children in the group as perceived by other children. Although some researchers in the past used behavioural observations to determine how well liked and disliked children are by their peers (social status), this method has been criticized as not allowing for a deeper understanding of the perceptions peers have of one another, with respect to likability (Moreno, 1934).

More recently, researchers interested in studying the social status of children have relied on peer assessment tools to obtain sociometric information on individual children. Although a variety of tools have been developed to conduct such assessments, a preference has developed in the field for positive and negative peer nominations. These nominations require children to identify peers whom they like and whom they dislike (Coie et al., 1982). Answers to these questions provide researchers with information on which children are extremely well-liked (popular), extremely disliked (rejected), both quite well-liked and disliked (controversial), as well as those who are neither especially liked nor disliked (neglected). Over the past thirty years, a wealth of information has been collected pertaining to the characteristics of children in these different sociometric status groups. Of particular focus in much of the research, though, are the

children who have low-accepted status (rejected and neglected children). With respect to rejected children, researchers have found that these children do not form a homogeneous group, rather some rejected children are characterized as being aggressive while others are characterized as being withdrawn. In general, sociometrics has provided researchers with a powerful tool to study children's social relationships on an individual by individual basis, however, it does not provide information pertaining to the dynamics of the social group to which individuals belong.

Over the years, researchers have tended to focus on either social networks or sociometrics. While there is a considerable amount of information known about the stability, frequency and behavioural characteristics of children in different social status positions, very little is known about the characteristics of children's social groups. By combining information on social networks and sociometrics, a greater understanding of the group structure of children with differing social status positions can be gained.

By using both the Social Cognitive Map and traditional sociometric peer assessment techniques, the major focus of this study was to expand the work of previous researchers (Ladd, 1983; Farmer & Rodkin, 1996) and to identify the social affiliations of children who were popular, rejected, controversial and neglected. This study described who the individual children in social groups were in terms of sociometric status. In addition, how well known children were within their group and how high profile their group was within the larger peer network were examined. Of particular interest were the social groups of rejected and neglected children. From the sociometric literature, it is known that rejected children are disliked by their peers and neglected children are generally ignored by their peers but little is known about how aware other children are of rejected and neglected children and the groups to which they belong. This study

aids in the understanding of how children relate to others and, for example, whether rejected and neglected children were more likely to be isolated from their peers.

In this paper, the concept of social cognitive maps is introduced and the characteristics, stability and size of social networks are discussed. Following this, the different methods of peer assessment of social status are discussed. This will help provide the reader with an understanding of the different measures available and give some insight into the reasons for the measure chosen for use in this study. After a discussion of the measure chosen for this study, the behavioural and cognitive characteristics of the different social status groups are identified. At the end of this literature review, the studies that examined both social networks and sociometrics are presented and discussed. This is followed by the identification of the hypotheses and research questions of this study. Finally, the details of the method and results are provided and the findings of this study are discussed.

Composite Social Cognitive Maps (SCM)

Children's peer relationships occur on many different levels (e.g., dyadic, small social groups, larger networks) and all impact on a child's emotional and social development (Cairns, Xie & Leung, 1998). While much research has focused on children's dyadic relationships, in particular children's best friendships (Parker & Asher, 1993), children function within the context of a larger peer group. It is this larger social group that is of interest in the present study.

The larger group was first studied by Cairns and colleagues (Cairns, Perrin & Cairns, 1985). They reflected on the research that studied friendships or social status and found that information about the larger groups of children in which friendships often occur was lost. By simply examining two children, and the relationship they shared, researchers were not able to

discuss other potential influences on children. Cairns et al. (1985) argued that information about a child's membership in a peer group and his/her position within that group is important in that it potentially provides unique information about the social actions of children within very complex peer environments.

In the context of research, certain terms have been used to help describe children's peer relationships within the larger peer group. Terms such as cliques, clusters and social groups have been used to describe a group of children who are identified by peers as regularly affiliating with one another. The term social network has been used when referring to the larger group of children (often all in one grade). Social networks are often made up of many different social groups.

Cairns and colleagues (Farmer & Cairns, 1991; Xie, Cairns & Cairns, 1999) have used the term centrality to describe the relative prominence of individual children and the social group to which they belong. This concept of centrality has allowed researchers to ask questions about which children are well-known by their peers and which social groups are particularly high profile. While it may be tempting to think of centrality as a reflection of leadership or influence, it is important to understand that it is essentially a measure of salience.

Cairns and colleagues (Xie, Cairns & Cairns, 1999) have used the term centrality to describe two important concepts: individual centrality and group centrality. Individual centrality refers to how high profile a certain child is within his/her social group. A highly central child refers to the child that all (or most) other children identify as belonging to that specific social group. On the other hand, group centrality refers to how high profile a certain social group is within the larger social network. A specific social group may be well-known for many different

reasons (e.g., highly aggressive or very prosocial) and it is the level of salience, not the reasons for it, that is fundamental to the measure of group centrality.

In the mid 1980's, Cairns, Perrin and Cairns (1985) sought a method for analyzing peer relationships within the larger group context. They wanted to collect information on the social networks to which children belong. To that end, they asked students in Grades 7, 8, and 9 to identify people in their class who "hang around together" and who "don't hang around with a particular group." The students were instructed to write down as many groups as they could think of. They were reminded to name themselves in the groups to which they belonged. From this information social maps were created for each child and, based on this, maps were created for each grade. Results indicated that, independent of whether they belonged to a social group, students produced maps that were very similar to those produced by their classmates. In addition to the information collected from students, two trained researchers observed the classes for a minimum of one hour over eight days both in the classroom and during gym class. By comparing the students social maps to the behavioural observations conducted by the researchers, it was concluded that student's identifications of social groups within their grade were quite accurate. Respondents did not make many errors of omission and very rarely made errors of commission.

In 1988, Cairns, Cairns, Neckerman, Gest and Garipey investigated the social structure in which aggressive children function (e.g., who affiliates with whom and the salience of the groups). Based on earlier research (Cairns et al., 1985), these researchers asked a large number of students in Grade 7 ($N = 695$) who "hangs around together" and who "hangs around by themselves." These researchers were also interested in identifying how aware the children were of their group, other groups, members of their group, and members of other groups. In essence,

these researchers were trying to distinguish between particularly salient groups (and children) and not especially salient groups (and children). After analyzing all of the social maps created by the children, a composite social map was created for each grade in which certain groups of children, or clusters, were identified as more or less central than others. Furthermore, each child's centrality within each of the clusters was determined.

The breakdown of centrality both for the groups as a whole and for the individuals within the group contained three possible categories: nuclear (most central), secondary, and peripheral (least central). The determinant of centrality for *individuals* was the number of times that a child was identified by others as belonging to that certain group. The determinant of centrality for the *groups* as a whole was simply the average of the two children in the cluster who received the highest number of nominations. To identify the levels of differentially salient children or groups, cut-off criteria were determined by Cairns et al. (1988). These cut-offs have now become the standard when identifying the different levels of centrality in children or groups. Children or groups who had been identified in the upper 30% of the nominations were classified nuclear. Children or groups who had been identified in the middle 40% of the nominations were classified secondary. Children or groups who had been identified in the lower 30% of the nominations were classified peripheral. In addition to these categories, children were identified as isolated if they were identified by peers as not belonging to any specific group. Essentially, *group* centrality reflects how well-known a specific peer group is to the children within that grade while *individual* centrality reflects how well-known it is that a child belongs to a specific group. This is important information because it provides researchers with a different view of peer relations than do either friendship or popularity information.

Group status within the network and individual status within the group were used to determine a student's overall network centrality. High centrality meant that the student was a nuclear member of a high-centrality group. Median centrality identified students who either had secondary status in a high-centrality group or nuclear or secondary status in a group of median centrality. Low centrality students were either peripheral members of any group or members of low-centrality groups. Isolated children were children who were identified as not a part of any group. In this study, this information was used by the researchers to comment on who aggressive children associated with, the centrality of the aggressive children in their groups, and the centrality of their groups as a whole (Cairns et al., 1988). As expected, it was found that physically aggressive children associated with other physically aggressive children. In addition, it was concluded that although highly aggressive children were less likely to be popular, they were equally as likely to be nuclear members of a group as other children and were no more likely than other children to be isolated.

Cairns, Gariepy, Kindermann and Leung (1998) extended earlier work by Cairns (Cairns et al., 1988; Cairns et al., 1985) and developed a method to analyze the composite social cognitive maps using a computer program. Information continued to be collected by asking students to identify social groups, however, analysis of the data collected was much less time consuming and complicated than in previous studies.

Overall, Cairns and colleagues have developed a new measure, the Social Cognitive Map procedure, and technology to analyze this measure, that is capable of identifying the groups of children that are affiliated with each other. This measure also identifies the salience of these groups and the children that belong to these groups. Through the use of this procedure, much has

been learned about the composition, characteristics, stability and size of the social groups of children.

Evidence of Within Group Homophily

Many researchers have closely examined the social groups that are identified by the SCM procedure to determine if there is any evidence of within-group homophily (e.g., do children affiliate with others who are like them). This area of research is particularly interesting because children and their peers exert mutual influences on one another. Of special interest has been aggressive children and their social groups (Cairns et al., 1988). Researchers have been interested in determining to what extent aggressive children hang around with other aggressive children. Knowing the composition of the peer groups can be an important factor in understanding the developmental outcomes associated with participation in a social group.

After almost a decade of research, there seems to be agreement that the children who make up each cluster share many similarities. At a very basic level, children who comprise groups tend to be similar in age, gender, socio-economic status, race, popularity, and the classroom they are in (Neckerman, 1992). Furthermore, children tend to be similar with respect to their academic motivations (Kindermann, 1993) and academic competence (Leung, 1993; Neckerman, 1992; Sun, 1994; Xie, Cairns & Cairns, 1999). Finally, children who belong to the same cluster tend to be similar with respect to aggression (Cairns et al., 1988; Gaines, Cairns & Cairns, 1994; Leung, 1993; Sun, 1994; Xie, Cairns & Cairns, 1999) and school suspensions and punishment (Gaines, Cairns, Cairns, 1994).

Behavioural Characteristics for the Four Social Cognitive Map Positions

The composite Social Cognitive Map procedure by which these researchers (Cairns et al., 1985; Cairns et al., 1998) identify the social maps of a large group of children has been utilized by many other researchers (Farmer & Rodkin, 1996; Kindermann, 1993; Rodkin, Farmer, Pearl & Van Acker, 2000; Xie, Cairns & Cairns, 1999). In 1996, Farmer and Rodkin examined the correlates of the four different composite social map positions: nuclear, secondary, peripheral and isolate. Participants in this study were 246 students from Grades 3 through 6. These students were asked to provide information about who hangs out together and who hangs out alone. They were also asked to nominate other students for a number of antisocial and prosocial items such as popular, athletic, shy/withdrawn, disruptive, and starts fights. Overall, they found that nuclear students were more often athletic, cooperative, leaders, popular and academic than were other students. Furthermore, while starting fights and being generally disruptive were correlated with lower centrality among girls, such antisocial behaviours in boys were not related to lower centrality. In fact, though non-significant, the means for these antisocial behaviours were higher for nuclear boys than for any other group. This is important because it suggests that aggression and antisocial behaviour may raise the awareness of peers regarding the child's social position.

In order to examine whether highly aggressive children tended to affiliate with each other, Xie, Cairns and Cairns (1999) examined the social networks of children with emotional and behavioural disorders in inner-city schools. The students who participated in their study ranged from Grades 4 to 7. These researchers were particularly interested in the aggressive children because of the potential influence group members have on each other with respect to academic learning and development. They noted that some relationships may be counterproductive to

learning and may not promote future school success. Rather, associations with deviant peers often support school dropout, failure and expulsion. They further wanted to examine the centrality of these highly aggressive children to determine if they tended to be nuclear in their social group or be isolated by their peers. They collected information pertaining to the social networks of the children and their interpersonal competence such as popularity and aggression. They found that nuclear girls tended to score high on popularity while nuclear boys tended to score high on aggression. Furthermore, as expected, children tended to affiliate with peers with similar behavioural characteristics.

Overall, research indicates that children tended to affiliate with like children. In addition, nuclear children tended to score high on popularity, leadership and academic ability. Furthermore, there seemed to be an interaction between gender and group status: antisocial girls were not highly salient to the peer group however aggressive boys were.

Stability of Social Networks

There is evidence that the social cognitive maps created by children are stable across time. In 1985, Cairns et al. found that the stability of these social maps created by Grade 7, 8, and 9 students over one year was quite high ($r = .70$). The groups obtained in the spring of the first year of data collection were remarkably similar to those obtained in the spring of the second year (Cairns et al., 1985). In 1991, Farmer and Cairns studied a small group ($N = 19$) of 10-13 year-old children. Although the correlations were not reported, they stated that, over one-week intervals, social networks of children were highly stable. In 1993, Kindermann studied the academic motivational composition of clusters of children in a larger group of Grade 4 and 5 children ($N = 109$). This was done by While the actual group membership fluctuated over a

period of one year, the motivational composition of the groups remained stable. Furthermore, Neckerman (1992) found that the stability of social networks can differ depending on the policies of the school the children attend. Neckerman concluded that the cluster stability is much lower in schools where the classroom composition changes from one year to the next than in schools where students remain together with other students in their classes from one year to the next.

In general, the limited literature on the stability of social networks indicates that, while social groups of children tend to be stable across time, this stability can fluctuate but mostly as an accurate reflection of the changes in the membership of the group over time. More research is needed to examine the stability of social networks.

Size of Social Networks

In general, there seems to be a trend that younger children belong to smaller groups than older children and that girls belong to smaller groups than boys, although findings are somewhat inconsistent across studies.

Cairns, Leung, Buchanan & Cairns (1995) studied 132 children from Grades 4 and 7 and found that the Grade 4 students formed smaller ($M = 5.02$) groups than did Grade 7 students ($M = 5.46$). The trend of older children having larger social networks was confirmed by Neckerman (1992) who examined 695 students from Grades 4 and 5 and re-examined these same students when they were in Grades 7 and 8. It was concluded that the groups of children were larger in the higher grades than they were in the lower grades.

Lagerspetz, Bjorkvest and Peltonen (1988) studied 167 Grade 5 children and found that boys formed larger groups ($M = 2.57$) than did girls ($M = 2.32$). The trend of boys having larger groups than girls was also reported by Leung (1993) who studied 305 children from Grades 4 and

7 in Hong Kong. Although the sizes of the groups were much larger than what was found by Lagerspetz et al., Leung also concluded that boys formed larger groups ($M = 6.04$) than did girls ($M = 4.77$). Furthermore, Kindermann (1993) found that while there was high variability of cluster size ($M = 2.13$) within the classrooms, the largest cluster in his study contained 7 boys. It is interesting to note that while boys belonged to larger groups than girls, more girls were clearly placed in social groups by their peers (95.3%) than were boys (66.9%) (Lagerspetz et al., 1988).

In general, although a general trend has emerged that younger children and girls belong to smaller groups while older children and boys belong to larger groups, the findings are not consistent and often the reported size difference in social groups is quite small. Furthermore, researchers have not consistently reported a similar size for social groups of children (group sizes reported in the literature have ranged from approximately 2 to 6 children). In sum, it appears that there is large variability in the sizes of children's peer groups.

Summary

In general, the Social Cognitive Map procedure has allowed researchers to study groups of children, who affiliates with whom and the centrality of different groups and individual children. Overall, it has been shown that children who make up social groups share many similarities (e.g., age, gender, race) (Cairns et al., 1988; Xie et al., 1999). Furthermore, research has shown that nuclear children tend to score high on popularity, leadership and academic ability than their peers (Farmer & Rodkin, 1996). In addition, research conducted to examine the stability and sizes of children's social groups have indicated that while children's social groups are relatively stable over time (Cairns et al., 1985), there is large variability identified in the sizes of these groups (Cairns et al., 1995; Lagerspetz et al, 1988).

Unlike the SCM literature, one area of peer literature which has not focused on the peer group structure but rather has focused on children's likability and social status within the peer group is the sociometric literature. While this literature has focused on the individual (as opposed to the group), it has generated much research on the impact of positive peer relations and the risks of peer rejection (e.g., being disliked by one's peers). In the present thesis, sociometric status and social network characteristics are examined in order to present a more complete picture of the child's social world and the structure of peer networks (joining group structure information with sociometric information).

Assessing Social Status of Children

Given the importance of peers, an effective method for assessing the peer system is required. Over the years, researchers have employed different assessment tools for examining the level of likability or popularity possessed by individual children. Although some researchers in the past simply observed groups of children to identify social status, Moreno (1934) commented that this procedure only permitted the researcher to comment on pairs of children, isolated children and the group with a distinct leader. Behavioural observations did not allow for deeper understanding of the group beyond these surface judgements.

One way to gain a deeper understanding was to examine the perceptions that children have of their peers, with respect to likability. It is quite informative to find out from children who, among their peers, is especially liked and who is especially disliked, thereby identifying children who hold different social status positions. Social status refers to the way in which a child is viewed by his/her peers. There are many different ways one can think about the possible social status positions within a peer group. Some children are especially liked and are very

popular with their peers. Others might be highly aggressive, particularly withdrawn or especially prosocial and these characteristics might have an impact on their popularity, or how well they are liked, within their peer groups. To allow for such a deeper understanding, different methods have been developed to assess the social status of children.

Over three decades, many researchers have used some variety of a rating scale, using either a class list or pictures of classmates, to obtain sociometric data about children (Asher & Dodge, 1986; Cillessen, van Ijzendoorn, van Lieshout & Hartup, 1992; French, 1990; Hymel, Bowker & Woody, 1993; Hymel, Rubin, Rowden & LeMare, 1990; Ladd, 1983; Ladd, Kochenderfer & Coleman, 1997; Rubin & Daniels-Beirness, 1983). Although rating scales have been used by many, there has been dissatisfaction expressed by some that ratings are limited in the information they provide as they cannot be used to distinguish between subtypes of low-accepted children. Another method that has been used to try to address this issue are peer nomination procedures.

Peer Nominations

Peer nominations of classmates as a basis for identifying social status have been used for more than 50 years. There are two types of peer nominations: positive - where children are simply required to identify other children who they like, and positive and negative - where children are required to identify other children who they both like and dislike.

Positive Nominations. Moreno (1934) introduced the concept of positive sociometric nominations by asking elementary school students to identify who they would like to sit next to in class. He instructed them to think carefully about the question and write down the names of two other children in the class. From these positive nominations, indices of attraction and

isolation were determined. Students who received three positive peer nominations were identified as attractive while students who received no peer nominations were identified as isolated.

Based on Moreno's (1934) work, Busk, Ford and Schulman (1973) examined 607 students in Grades 4 through 8 using positive peer nominations in order to determine the stability of sociometric responses in the classroom. These researchers asked children "whom in this class do you personally like the most?" Similar to Moreno, from this single measure information regarding acceptance and rejection were determined. They concluded that sociometric peer nominations were relatively stable, with a trend towards greater stability as children increase with age, reaching a ceiling at Grade 6 (i.e., no significant differences in stability of sociometric nominations between Grades 6, 7 and 8). Furthermore, as was expected, stability decreased when the length of time between sociometric nominations was increased.

Despite these findings, other researchers have argued that this measure of peer sociometric status is inadequate because low scores on positive nominations do not allow the researchers to distinguish between children of differing low-status (Asher & Hymel, 1981; Dodge, 1983). Positive nomination scores have a low correlation ($r = -.2$) with negative nominations scores (Asher & Hymel, 1981). Therefore, using only a low frequency of positive nominations to define low-status confounds the different groups of low-status children. There is no differentiation between children who are actively disliked and children who are not especially liked or disliked (Dodge, 1983). Furthermore, Coie, Dodge and Coppotelli (1982) argued that constructually there is a large difference between children who are not frequently listed as being liked and children who are listed as being not liked; there is a difference between simply not

being nominated as liked and being actively disliked by peers. Even though some researchers have used Busk et al.'s (1973) procedure for positive peer nominations as a means to identify sociometric status within a group of children (Asher & Dodge, 1986), rating scales and positive and negative nominations have been the most frequent methods of obtaining sociometric information about children.

Positive and Negative Nominations. Despite the stability of unidimensional peer nominations, researchers have questioned the face validity of interpreting a lack of nominations as meaning rejection (Schneider, 2000). To counter this, many researchers turned to positive and negative peer nominations which required children to nominate other children who they like as well as children who they do not like. To elicit these nominations, children were asked, for example, to list three children who they liked the most and three children who they liked the least (Hartup, Glazer & Charlesworth, 1967; Peery, 1979), who they best like to play with and who they don't like to play with (Dunnington, 1957), and who their best friends were and who they least liked to play with (Green, Vosk, Forehand & Beck, 1981; Newcomb & Bukowski, 1983). While some of the researchers were requiring children to spontaneously make their nominations (Dunnington, 1957; Newcomb & Bukowski, 1983; Peery, 1979), other researchers provided the children with a class list to make their choices from (Green et al., 1981) or a set of pictures of the group of children from which they should make their nominations (Dodge, 1983; Hartup et al., 1967).

Often considered seminal work in the area of positive and negative sociometric classifications, Dunnington (1957) asked children who they best liked to play with and who they didn't like to play with. The data were analyzed by summing the positive and negative

nominations. A single score was then obtained by subtracting the negative nominations from the positive nominations. From this information, three distinct social status groups were identified: high status, middle status, and low status. Results indicated that high status children exhibited more positive expression towards peers than did low status peers. Furthermore, high status children were more often self-initiators and sought adult assistance less often than low status peers.

Based on Dunnington's 1957 work, Peery (1979) used two general scores for social acceptance (number of positive peer nominations) and social rejection (number of negative peer nominations) to identify the social impact and social preference of each child. Social impact scores were computed by summing the number of positive and negative scores a child received while social preference scores were computed by subtracting the number of negative scores from the number of positive scores. Essentially, social impact scores measured how much of an impact a child made on his/her environment while social preference scores measured how well a child was liked. Using these two new indices, Peery was able to identify four specific social status positions (popular, rejected, amiable and isolated) rather than relying on Dunnington's (1957) three-point range (high, middle and low). Peery defined popular children as having high social impact scores and high social preference scores, while rejected children had high social impact scores but low social preference scores. Amiable children had low social impact scores and high social preference scores and finally, isolated children had low social impact and social preference scores.

Current Measure of Sociometric Status

After consideration based on literature available at the time (Dunnington, 1957; Peery, 1979), Coie et al. (1982) collected data by asking children to nominate peers who they like most (LM) and peers who they like least (LL). These liked most (LM) and liked least (LL) scores were summed and standardized across grade. From this information, "social preference" scores were obtained by subtracting the standardized LL scores from the LM scores. "Social impact" scores were obtained by adding the standardized LM and LL scores. Using the social impact and social preference scores, five different sociometric status positions were defined with every child fitting into one of the five positions. "Popular" children had social preference scores greater than 1.0, standardized LM scores greater than 0, and standardized LL scores less than 0. "Rejected" children had social preference scores less than -1.0, standardized LM scores less than 0, and standardized LL scores greater than 0. "Controversial" children had social impact scores greater than 1.0 and had both standardized LM and LL scores greater than 0. "Neglected" children had social impact scores less than -1.0 and absolute LM scores of 0. "Average" children had social preference scores between -.5 and +.5. In addition to these five social status positions, some researchers have reported on unclassified children in their sample. These are all of the other children (those not classified as popular, rejected, controversial, neglected or average). These children score between .5 and 1.0 standard deviations on social preference and therefore are not classified into one of the five sociometric status positions. While some researchers made no mentions of these children (Coie & Dodge, 1983; Kupersmidt & Coie, 1990), others identified them but usually did not include them in any of their analyses (Coie et al., 1982; Ray, Cohen, Secrist & Duncan, 1997).

Although the criteria for being identified in one of the first four status groups tended to remained the same across studies, there does not appear to be agreement with respect to the identification of the average and unclassified status. While Coie et al. (1982) defined average children as having standard scores between $-.5$ and $+.5$ on social preference and unclassified children as having standardized social preference scores between $+.5$ and $+1.0$, these researchers (and others) have at other times simply defined the average children as having scores between -1.0 and $+1.0$ on social preference, essentially combining the average and unclassified children, (Bagwell, Coie, Terry & Lockman, 2000; Coie & Dodge, 1983; Coie & Kupersmidt, 1983; Kupersmidt & Coie, 1990).

In general, the Coie et al. (1982) criteria for identifying popular, rejected, controversial and average children seems to be well accepted and is the most commonly used technique for identifying children of different social status positions (Coie & Dodge, 1983; Ray et al., 1997).

Stability of Sociometric Nominations

In 1983, Coie and Dodge conducted a longitudinal study of third and fifth grade students, over a five year period, to examine the stability of elementary school children's behaviour characteristics and social adjustment with peers. Through the use of positive and negative sociometric measures they found that the rejected group was the most stable of the five social status groups (correlations ranged from $r = .45$ after one year to $r = .30$ after four years). Popularity in children was found to be moderately stable over one year ($r = .36$) and, not surprisingly, much less stable over four years ($r = .21$). The stability of controversial children ($r = .31$ over one year; $r = .14$ over four years) and neglected children ($r = .25$ over one year; $r = .24$ over four years) was notably lower than it was for rejected children. Overall, the researchers

did conclude that status in one year was significantly related to the status of that child during the previous year, and that there were no significant gender differences in stability of social status. These findings were consistent with those of Cillessen, Bukowski and Haselager (2000) who conducted a 12 study review, involving children of all grades, of sociometric stability over periods of one month to four years . They concluded that the stability of social status groups was weaker as the test-retest interval increased and that the rejected, popular and average categories were more stable than were the neglected and controversial categories.

Furthermore, sociometric status predictability was enhanced when certain behaviour characteristics were known (Coie & Dodge, 1983). Being cooperative and starting fights were highly predictive of social preference scores and both were relatively stable over time (correlations over four years ranged from $r = .62$ to $r = .38$ for being cooperative and $r = .83$ to $r = .44$ for starting fights). Of particular interest was the stability of neglected children. The researchers pointed out that these children did not become rejected or controversial as they got older. However, many of the rejected children became neglected over time. In general, researchers have concluded that nominations of sociometric acceptance and rejection of elementary school children are quite stable over time (Asher & Dodge, 1986; Asher et al., 1979; Cillessen, Bukowski & Haselager, 2000; Coie & Dodge, 1983; Coie & Kupersmidt, 1983; Kupersmidt, Burchinal & Patterson, 1995).

Percentage of Children Within Sociometric Status Groups

There does seem to be a general consensus on what percentage of children belong in each of the five sociometric status groups. It is important to note that although the percentage of children within sociometric status groups is informative, they are somewhat artificial since the

groups themselves (popular, rejected, controversial and neglected) are defined by establishing a criterion cut-off of scores greater than one standard deviation from the mean. Whether this cut-off has any clinical meaning may be questionable.

Kupersmidt and Coie (1990), who studied Grade 5 children, identified 12% of their sample as popular, while other researchers have identified a higher percentage. Coie and Dodge (1983), who studied children in Grades 3 and 5, identified 23% of the children in their study as popular and Coie et al. (1982), who studied students in Grades 3, 5, and 8, identified 22% of their students as popular. With respect to rejected children, there is general agreement that approximately 20% of children are identified as rejected by their peers (Coie & Dodge, 1983; Coie et al., 1982; Kupersmidt & Coie, 1990). Kupersmidt and Coie (1990) and Coie and Dodge (1983) identified low numbers of controversial children (approximately 5%) while Coie et al. (1982) reported that almost 15% of their sample were controversial. This difference might be accounted for by the differing age ranges in the different studies. The percentage of children who were identified by their peers as neglected ranged from 10% (Kupersmidt & Coie, 1990) to 20% and 24% (Coie & Dodge, 1983 and Coie et al., 1982 respectively). Finally, average children were identified using various criterion. Coie et al. (1982) identified 16.5% of children as average using the criteria of having social preference scores between $-.5$ and $+.5$. Using different criteria (simply identifying all children not previously categorized into the other four social status groups) Coie and Dodge (1983) identified 30% of their sample as average and Kupersmidt and Coie (1990) identified 56% of their sample as average.

Despite fluctuations in these findings, general estimates of the frequency of sociometric status groups can be made: popular, rejected and neglected children are approximately equal in

proportions (20%), controversial children tend to make up less than 10%, and average children comprise almost 39%. With respect to the unclassified children, frequencies ranged from 37% of a sample of 275 children (Ray et al., 1997) to 57% of a sample of 848 (Coie et al., 1982).

While most researchers simply reported the frequencies that were identified for each sociometric group, some researchers have conducted further analyses to allow for gender differences to emerge. Researchers have found that girls tended to be under-represented in both the rejected status group (girls: 10.6%; boys: 15.4%) (Coie & Dodge, 1983 ; Coie et al, 1982) and the controversial group (Coie & Dodge, 1983). Coie and Dodge did not report the percentages in their article, but did say girls were significantly under-represented in the controversial group. Furthermore, Coie, Terry, Lenox, Lochman and Hyman (1995) found that, although girls were not as frequently identified as rejected, being rejected was more predictive of maladjustment later in adolescent for girls than it was for boys.

Behavioural and Cognitive Characteristics of Sociometric Status Groups

Sociometric information has the ability to differentiate children who are liked and not liked but cannot identify specific behaviours associated with the five social status positions. Researchers began to focus on identifying the behavioural differences of the sociometric groups in the early 1980's (Coie et al., 1982; Coie & Kupersmidt, 1983). A number of conclusions were drawn about children who are popular, rejected, controversial, neglected and average.

Popular children tend to be very cooperative with peers, are often seen as leaders and generally act in a very prosocial manner (Coie et al., 1982; Rubin & Daniels-Beirness, 1983). These children tend to be less withdrawn and more sociable than average children (Newcomb, Bukowski & Pattee, 1993). Furthermore, they possess stronger cognitive and social abilities than

children in the other four social status categories (Newcomb et al., 1993; Rubin & Daniels-Beirness, 1983). Children who are popular tend to view themselves positively with respect to social competence and generally do not report being lonely (Hymel et al., 1990). In general, they are not seen as aggressive by their peers (Coie et al., 1982) and Coie and Kupersmidt (1983) found that popular girls rarely displayed physical aggression.

Rejected children, the children who are least liked by their peers, do not comprise a homogeneous group; these children can often be identified as either aggressive rejected or submissive rejected by subsequent questionnaires (Asher, Parkhurst, Hymel & Williams, 1990; Cillessen et al., 1992; French, 1990; Hymel et al., 1993; Parker & Asher, 1993; Parkhurst & Asher, 1992). Although sociometrically they are often labeled the same, these two subgroups are quite different behaviourally. Rubin, Coplan, Chen and McKinnon (1994) commented that, in general, aggressive-rejected children can be characterized as having a tendency for hostile behaviour and have limited problem solving skills with regards to interpersonal problems. On the other hand, withdrawn-rejected children can be generally characterized as having a tendency towards submissive behaviour and often feel poorly about themselves.

Unfortunately, not all research has differentiated the two types of rejected children. In studies that did not differentiate between the two types of rejected children, rejected children were often identified by their peers as those who fight, disrupt and seek outside help (Coie et al., 1982). In fact, Dodge, Coie and Brakke (1982) found that they were considerably more aggressive than popular or average children. They tend to be not cooperative, are not usually leaders (Coie et al., 1982; Dodge et al., 1982) and they spend more time on task-inappropriate behaviours in the classroom than their peers (Dodge et al., 1982). They are very talkative and

interactive and generally respond to confrontation by acting aggressively (Coie & Kupersmidt, 1983). Finally, these children tend to have higher levels of depression and anxiety than popular, average or neglected children (Newcomb et al., 1993).

Newcomb et al. (1993) performed a meta-analysis on 41 studies to identify behavioural differences in sociometric standings as found in previous bidimensional sociometric studies. Overall, consistent evidence was found in the literature that the children who were classified as rejected differ significantly from the average status group on many variables. Rejected children tended to be more aggressive and withdrawn than did average children. In addition, they exhibited less sociable actions and were less cognitively skilled than were average children. Interestingly, it is clear that aggression alone cannot be credited with the rejection status since these researchers found that controversial children were even more aggressive than the rejected children. The controversial children were very aggressive (more than any other social status group) but they were also very sociable. For rejected children, it seems to be the combination of lack of sociability and high aggressiveness that is related to their rejection by peers. Newcomb et al. concluded that the social development of rejected children is certainly at risk. Rejected children are usually deprived of the socialization that is awarded to non-rejected children. Opportunities to improve social skills and social competencies are greatly diminished for rejected children.

In addition to the many behavioural differences of rejected children there is substantial evidence that rejected children possess weaker cognitive abilities than their higher status peers. Many researchers have studied the social cognition of children and concluded that children who are viewed negatively or disliked by their peer group often have deficiencies in the way they

process social information; they think differently than higher status peers about social problems and possible solutions to social problems (Bierman & Welsh, 1997; Dodge & Feldman, 1990; Newcomb et al., 1993; Rubin, et al., 1982; Rubin, Hymel & Mills, 1989). In a 41 study meta-analysis, Newcomb et al. (1993) found that popular and rejected children both differed significantly from average children with respect to cognitive abilities. While popular children's social cognitive skills were superior, rejected children had weaker social cognitive skills than their peers in any of the other sociometric status groups.

In 1994, Crick and Dodge proposed a model of social-information processing that identified six different stages of processing and hypothesized that deficiencies in any of these stages can lead to social difficulties. The first two stages of their model involve the encoding and interpreting of cues. Crick and Dodge discussed the evidence that socially maladjusted children often attend to different (and more aggressive) cues than do well-adjusted children and often make errors in interpreting these cues. Furthermore, these researchers discussed the literature that supports the hypothesis that after interpreting (or misinterpreting) social cues, rejected children tend to process these cues with a hostile attribution bias, even when the intent was neutral. Crick and Dodge's fifth stage involves making a response to the social cue. They found that maladjusted children tend to create more aggressive and less prosocial responses than do well-adjusted children.

Controversial children are similar to both popular and rejected children. Like popular children, they are often viewed as leaders by their peers but like rejected children, they are also viewed as being generally disruptive, starting fights and seeking help (Coie et al., 1982). In fact, research indicates that controversial children exhibit higher levels of aggression than any other

sociometric group (Newcomb et al., 1993). However, unlike both popular and rejected children, controversial children are neither overly cooperative nor uncooperative (Coie et al., 1982). In general, these children are very visible (both positively and negatively). Coie et al. (1982) found that they were the least shy of the five sociometric status groups and Newcomb et al. (1993) identified controversial children as much more sociable than average children and as sociable as popular children.

Neglected children are generally not visible in terms of behavioural characteristics. These children tend to score well below the mean on cooperation, disruption, fighting, and seeking help and well above the mean on shyness (Coie et al., 1982). They are viewed as the least talkative and interactive by their peers and tend to respond to confrontation by withdrawing (Coie & Kupersmidt, 1983). In the meta-analysis performed by Newcomb et al. (1993), it was found that although neglected children were less aggressive and less sociable than average children, there were not many significant differences between the neglected and average children.

Researchers have not devoted much energy studying average children. In general, average children do not tend to deviate from the mean on scores relating to cooperation, disruption, fighting, seeking help and are above the mean on shyness (Coie et al., 1982).

Summary

Overall, it has been shown that, in the past, a variety of tools have been used to measure sociometric status. Some of these tools, such as rating scales and positive peer nominations, lacked the ability to adequately distinguish between sub-types of low-accepted children. Positive and negative peer nominations allow for such a distinction to be made between rejected and neglected children. With respect to the behavioural characteristics of the sociometric groups,

popular children tend to be leaders, cooperative and sociable. Rejected children, on the other hand, tend to be characterized as either aggressive or withdrawn. Controversial children share many of the characteristics of both popular and rejected children in that they are often viewed as leaders but also tend to be quite aggressive. Finally, neglected children are characterized by their withdrawal.

While there is a considerable amount of information known pertaining to the stability, frequency, and behavioural and cognitive characteristics of children from the five different sociometric status groups (popular, rejected, controversial, neglected and average), very little is known about the dynamic characteristics of children's social groups. The development of the Social Cognitive Map procedure gave researchers a tool to do just that. I am particularly interested in the information that can be gleaned from combining both sociometric measures and the Social Cognitive Map procedure. This will provide insight into the different social status positions of children and their group structures. Furthermore, since sociometric nominations are obtained from within the classroom while social network information is obtained from the whole grade, information pertaining to the larger group of children (within grade) will be combined with specific information pertaining to a smaller specific groups of children (within classroom).

Social Network Position and Sociometric Status

Over the years, researchers have tended to focus on either social networks or sociometrics. However, over a half a century ago, Bronfenbrenner (1943, p. 363) commented that the study of social development needs to apply to "not only the individual, but to the social organization of which he is a part". Recently, a few researchers have been interested in describing the social networks of children who have been identified as popular, rejected,

neglected, average or isolated (or some subset of these sociometric classifications). Prior to the development of the SCM procedure (Cairns et al., 1985), researchers combined sociometrics with observations of children's social networks (Ladd, 1983). Since the development of the SCM procedure, researchers have been able to combine sociometrics with children's social network positions (Farmer & Cairns, 1991; Farmer & Rodkin, 1996).

Prior to the development of the Social Cognitive Map procedure (Cairns et al., 1985), Ladd (1983) sought to examine the social networks of popular, average and rejected children. In addition to other measures, sociometric status information and social network information was collected. Sociometric status information was obtained using a rating-scale from students in Grades 1 through 6 at two different elementary schools. From the data collected, children were identified as either popular (z scores > 1.0), average (z scores between -0.5 and $+0.5$), or unpopular (z scores < -1.0). Since rating scales do not effectively distinguish between rejected and neglected status children, teachers were asked to identify the unpopular children as either rejected or neglected (57% of the unpopular children were subsequently identified as rejected by their teachers). It was noted that the teachers indicated less confidence in their identification of neglected children than in their identification of rejected children. Although data was collected on children from all grades in the two schools, the only children that were studied were those in Grades 3 and 4 (the data from the rest of the students was used to determine the social status of the companions of the Grade 3 and 4 students). The total sample for this study was 48 students (four girls and four boys in each of the popular, average and rejected groups at both schools).

The social network information was collected through playground observation. Playground observations took place over a 16-week period. Observers recorded such

information as: interactive behaviour (social conversation, cooperative play, arguments, and rough and tumble play), non-interactive behaviour (unoccupied, on looking, solitary play, and parallel play), and extraneous (other) behaviours. The observations also yielded information about the percentage of time the children spent in various behaviours on the playground and the percentage of time the children spent with peers of similar grade levels and gender.

In general, Ladd (1983) found that there were significant differences between the three sociometric groups with respect to their behaviours within social networks. First, it was found that popular and average children spent significantly more time engaged in social interactions with their peers than rejected children. Despite gender differences with respect to the type of activities the children engaged in (boys tended to play in organized activities while girls tended to engage in social conversation) this finding indicates that popular and average children do belong to social networks. It was also found that rejected children spent more time alone and were unoccupied on the playground more than either popular or average children. In terms of social networks, it can be concluded that popular and average children belong to more groups or are more central in groups than are rejected children, who often do not belong to any group. A particularly interesting finding was that rejected and average children spent equal amounts of time watching others play. This indicates that average and rejected children might not be as central to the social networks as popular children. Another interesting finding was that rejected girls were involved in three times as much parallel play as either boys or girls in the other two sociometric status groups. This indicates that they "hang out" with other children, but do so on the edge of the group.

Overall, Ladd has shown that popular children seem to have many interactions with peers

and spend the least amount of time alone. In terms of the social networks of popular children, Ladd's findings seem to indicate that these children might be the ones who hold nuclear positions within social networks. Average children spend more time with others than do rejected children but similar amounts of time watching others play as rejected children. In terms of social networks, these children might occupy the secondary network positions rather than nuclear ones. The rejected children spend less time engaged in social interactions and more time alone than other children. In terms of their social networks, it seems that these children do not hold positions in groups (they are isolated) or they hold peripheral positions.

Since the development of the SCM procedure, Farmer and colleagues (Farmer & Cairns, 1991; Farmer & Farmer, 1996; Farmer & Rodkin, 1996) examined the overlap of social status and social network position. In 1991, Farmer and Cairns studied the social status and social networks of emotionally disturbed children. They recruited 10-13 year-old children ($N=19$) who attended a residential school for emotionally disturbed children. Social networks were analyzed using the SCM procedure described in Cairns et al. (1985). The sociometric status information was collected through bidimensional nominations and children were categorized into one of five sociometric status groups (popular, rejected, neglected, controversial, and average) according to Dodge (1983). Although there was a very small sample size, there was quite a high correspondence between cluster membership and sociometric status. Farmer and Cairns (1991) found that popular children were almost always cluster members while neglected and rejected children were not likely to be cluster members.

In 1996, Farmer and colleagues (Farmer & Farmer, 1996; Farmer & Rodkin, 1996) sought to identify some of the correlates (including popularity and withdrawal) of social network

positions in children with exceptionalities. They recruited 246 students from mainstream classrooms who had previously been identified as emotionally and behaviourally disordered, academically gifted, learning disabled or in general education. Social network information was collected using the SCM procedure (Cairns et al., 1985). Although sociometric nominations were not collected, children were required to nominate three children who best fit the following eight descriptors: cooperative, starts fights, popular, athletic, disruptive, leaders, good at school work, and shy/withdrawn.

Overall, these researchers found that children who were nuclear members of a group were more often nominated as popular, leaders and good at school work than were children in any other social network position. Furthermore, children who were isolated were more frequently identified as shy/withdrawn by their peers than were children in any other social network position. An interesting gender difference also emerged; physically aggressive behaviour was positively associated with higher centrality among boys, yet positively associated with lower centrality among girls. In general, these results support previous findings (Ladd, 1983) which suggested popular children are nuclear members of social groups. Finally, this data also suggests that withdrawn or neglected children are isolated from social networks or are peripheral in social groups.

More recently, Bagwell, Coie, Terry and Lochman (2000) conducted research to examine the relationship between peer rejection and participation in peer cliques in pre-adolescence. They were interested in exploring the relation between physically aggressive-rejected children and their affiliation with deviant peer cliques.

The students included in the sociometric roster were in Grades 4-8 ($N = 824$). The

measure used to determine peer group membership was adapted from Cairns et al. (1985). In total, 623 completed sociometric rosters, identifying the peers they “hang around with” and nominating both themselves and peers on five different prosocial and antisocial behavioural characteristics. From this information, children were categorized into one of five sociometric groups, based on the method used by Coie et al. (1982). Individual status within a clique was determined by using a factor analytic method based on the work by Cairns et al. (1985). Aggression status was determined by summing and standardizing the nominations received for the item “stars fights, picks on other kids, teases them.” Children with standardized aggression scores greater than one were classified as aggressive and all other children were classified as non-aggressive.

These researchers found that rejected children were less central members of the clique to which they belonged than were average or neglected peers. Moreover, not only were rejected children more peripheral members of cliques, but they often belonged to cliques with other low-status peers.

In general, the research that combines sociometrics with social networks has been quite limited. In 1983, Ladd provided insight into this area but did so before analysis of social cognitive maps had been fully established. Subsequently, Farmer and colleagues (Farmer & Cairns, 1991; Farmer & Farmer, 1996) studied this area but did so with small samples of non-normative children. In fact, quite recently Kindermann (1998) commented that researchers should be encouraged to examine the relations between existing sociometric classifications procedures (Coie et al., 1982) and the Social Composite Map procedure (Cairns, et al., 1985). This was the purpose of the present study.

The Present Study

As an extension of current research, the present study sought to examine the different social status positions of children with respect to their centrality within their social group and the centrality of their group within the larger social network. To do so, children completed both positive and negative sociometric nominations and a social cognitive map procedure. In addition, the children completed a behavioural assessment measure that allowed analyses pertaining to rejected children to include aggression as a possible variable. The information on the overlap between social networks and social status is particularly interesting considering the measures used. Social network information was obtained by asking children about all of their peers in their grade while social status was obtained by restricting children to peers they like and dislike within their classroom. In other words, when a child is identified as rejected, it is by his/her classmates. This status does not provide the researcher with any information pertaining to the larger peer group involving all of his/her grade-mates.

The focus of this study was to examine the social affiliations of pre-adolescent children who are popular, rejected, controversial and neglected. Previous research has provided researchers with information pertaining to individual characteristics of these children and this study will extend our knowledge by describing the members of their social groups in terms of social status and, for rejected children, in terms of aggression. Of particular interest will be the rejected and neglected children. As defined by sociometrics, rejected children are very disliked by their peers, however, until recently researchers did not have the tools to study, in detail, the characteristics of those children they associate with. Furthermore, as defined by sociometrics, neglected children are generally not liked or disliked by their peers. This study will provide us

with a greater understanding of their social groups, as well. In general, this study will provide insight into the social dynamics of all children, and particularly, of children who are low-accepted by their peers.

Hypotheses and Research Questions

Research Questions

There were two general research questions that were addressed in this study. First, there was some question about the relationship between the individual level (or group level) of centrality and the scores that were used to categorize children into their sociometric status. Thus the first research question was, "Are social impact and social preference scores related to a child's individual or group centrality?" Second, with respect to all of the hypotheses and the above research question, it would be interesting to learn of any potential gender differences. There were no specific expectations about what differences there might be, rather this research was exploratory. Thus, the second research question was, "When examining the overlap between social networks and sociometrics, are there differences between girls and boys?"

Hypotheses

Given the previous research on both social networks and sociometrics, a number of hypotheses have been generated pertaining to the centrality of the popular, rejected, controversial and neglected children within their social group and the centrality of the group to which they belong.

Popular children are often identified by their peers as leaders and are very prosocial (Coie et al., 1982). They are identified as being well liked, possess stronger cognitive abilities than their peers (Crick & Ladd, 1994; Newcomb et al., 1991) and are not generally seen as aggressive

(Coie et al., 1982). Research conducted by both Ladd (1983) and Farmer (Farmer & Cairns, 1991; Farmer & Rodkin, 1996) has suggested that popular children definitely belong to social networks and are most likely nuclear members within these groups. Therefore, it is the first hypothesis of this study that popular children will be nuclear members of their social groups. Moreover, it is predicted that their overall network centrality scores will be higher than that of their peers.

Rejected children are characterized by a tendency to be either aggressive or withdrawn. They are not as cognitively able as their peers (Newcomb et al., 1991) and are identified by their peers as those who fight, disrupt and seek help (Coie et al., 1982). Research by Farmer and Cairns (1991) found that rejected children were not likely to belong to a group. It is the second hypothesis of this study that rejected children will differ from their peers with respect to their centrality within their social group and with respect to the centrality of the group to which they belong. Specifically, it is hypothesized that rejected children, compared to their peers, will have the lowest overall network centrality scores. Finally, since some rejected children are very aggressive while others are withdrawn, it is hypothesized that these children will not be homogeneous with respect to group membership. Aggression status will be examined to identify any possible relationship with group membership and rejected status. More specifically, analyses will be conducted to determine if there is a difference, with respect to aggression, between rejected children who belong to a group and those who do not.

Controversial children are often viewed as leaders by their peers, but are also very disruptive and start fights (Coie et al., 1982). They are more aggressive (Newcomb et al., 1991) and less shy (Coie et al., 1982) than their peers. The literature on the overlap of sociometric

status and social network position does not indicate which position these children may occupy, but the research on sociometric status alone suggests that they have high status in low status groups. It is, therefore, the third hypothesis of this study that controversial children will have nuclear status in secondary or peripheral groups.

The consensus in the literature on neglected children seems to be that they are not seen. They are the least talkative and interactive of children in all sociometric status categories (Coie & Kupersmidt, 1983). They score well below the mean on cooperation, disrupting, fighting and seeking help, and are considerably shyer than their peers (Coie et al., 1982). Farmer and Cairns (1991) found that they do not tend to belong to any social groups, and Farmer and Rodkin (1996) confirmed that shy children are more often isolated than children in any other social network position. Thus, it is the fourth hypothesis of this study that neglected children will either hold secondary or peripheral positions in secondary or peripheral groups or be isolated from the greater social network.

Method

Participants

The participants in this study were 499 children from Grades 4, 5, and 6 (252 girls; 247 boys). The age of these children ranged from 9 years to 12 years with a mean age of 10.47 ($SD = .93$) years. All of the children were students in one of 26 classes from three elementary schools in the Ottawa Carleton District School Board. Parental consent forms had previously been sent out to 646 children, 77% whom were granted permission to participate in the study. The average consent rate for the classes was 75% with a range from 28% to 91% (See Appendix B for distributions). Due to an inadequate consent rate in seven classes (i.e., less than 70%

participation rate) (Crick & Ladd, 1989), only 19 classrooms were included in these analyses, yielding a final total of 392 children (199 girls, 193 boys). With the exclusion of these classes, the classroom consent rate ranged from 70% to 91%. The data for this study were collected as a part of a larger study conducted by a Ph.D. candidate at Carleton University.

Measures

Three measures were used in this study. Two of these measures were completed by the students (Sociometric Nominations and Social Cognitive Maps) and one measure was completed by the classroom teachers (Ratings of Children's Social Behavior - Teacher Form). These measures assessed social status, social networks, and behavioural style respectively.

Sociometric Nominations. To assess social status cross-gender nominations were collected. The participating students were asked to nominate three peers in their class they especially like to spend the most time with (LM) and the three peers they especially do not like to spend time with (LL) (See Appendix C). The children were instructed that, although they cannot list more than three children for each scenario, it is acceptable to name fewer. Furthermore, the children were asked not to discuss their responses with their peers and thus were assured of the confidentiality of their responses.

Sociometric status was determined based upon the method as outlined by Coie et al. (1982). For each participant, the LM (liked most) and LL (liked least) nominations were totaled, transformed into standard scores within each class. Social preference scores were calculated by subtracting the standardized LL scores from the standardized LM scores. Social impact scores were calculated by adding the standardized LM and LL scores. Children with social preference scores greater than 1.0, standardized LM scores greater than 0, and standardized LL scores less

than 0 were classified as popular. Children with social preference scores less than -1.0, standardized LM scores less than 0, and standardized LL scores greater than 0 were classified as rejected. Children with social impact scores less than -1.0 and absolute LM scores of 0 were classified as neglected. Children with social impact scores greater than 1.0 and had both standardized LM and LL scores greater than were classified as controversial. Children with social preference scores between -.5 and +.5 were classified as average. Anyone within .5 standard deviation was categorized as unclassified.

Social Cognitive Maps. Data were collected regarding the social networks for each grade (See Appendix D). Consistent with past research, the children were instructed to think of groups of children that “hang around” together in their grade. They were told that if they could think of groups, they should list the names of all of the students in each group. The children were then instructed to list all of the groups that they could think of. They were reminded to list their own group and include themselves if they belonged to a group. They were also asked to list all the children who do not hang around in a group. These procedures followed the protocol developed by Cairns et al. (1985). The children’s responses were analyzed according to the SCM procedures developed by Cairns, Gariepy, Kindermann and Leung (1991).

This program generated a co-occurrence matrix, which listed all the students in a grade in the row and the column. Each off-diagonal number in the matrix summarized the number of times two students corresponding to the row and the column were nominated in the same group. Each diagonal number represented the total number of occasions that a given person was named to any group. A correlational matrix was then generated by intercorrelating the column in the co-occurrence matrix. The magnitude of the correlations represented the degree of similarity

between two personal profiles of co-occurrences. If two students were groupmates, high similarity in their personal profiles of co-occurrences was expected. Based on the recommendation of Cairns et al. (1991), a cut-off point of .40 was employed to determine whether two people were in the same social group.

Ratings of Children's Social Behavior - Teacher Form. To assess children's overall behavioural style, data were collected from teachers regarding the aggression and prosocial behaviour of the children in their class (See Appendix E). Teachers were asked to rate each child on a 5-point Likert scale on how true the statements were about the child (never true to always true). Three of the subscales on this measure reflect a child's use of physical aggression (e.g., "This child hits, shoves, or pushes peers"), relational aggression (e.g., "This child spreads rumors or gossips about peers"), and prosocial behaviour (e.g., "This child tries to cheer up peers when they are sad or upset about something"). This measure is the teacher version of the peer nomination measure designed by Crick (1996). Although researchers have shown a preference for peer nominations, research has shown teacher reports to be valid when peer nominations are not available (Crick, 1996).

Procedure

In April 2001, parental permission forms were sent home with children from the participating schools (see Appendix F). In May and June, children who received parental consent were asked to complete a set of measures, two of which were the sociometric nomination measure and the Social Cognitive Map measure. Under the direction of the principal investigator, Carleton University faculty, graduate students and senior undergraduate students administered the questionnaires during a group session in the individual classrooms, lasting

approximately 40 minutes. After briefly explaining the purpose of the study and discussing the importance of keeping all responses confidential with the students, the questionnaire was read aloud while the students followed along and recorded their responses on an answer sheet. At the end of the group session, the students were debriefed about the purpose of the study (see Appendix G) and a debriefing letter was sent home for parents (see Appendix H). Since a high consent rate was required for reliability of the sociometric nominations, a pizza party was offered to the classrooms that had the highest return rate of their consent forms (participation was not a requirement).

Results

In order to comprehensively examine the nature of the relationship between social status (likability) and centrality (salience) within social networks, two different approaches were taken in analyzing the results.

First, social status was assessed using two continuous variables, preference and impact scores, which were generated based on the number of positive and negative nominations received from peers. These variables were used as the dependent variables in the first set of analyses. These analyses ask the question: “Do children who differ in terms of their salience in their social network (individual, group, overall) also differ in preference, how well liked they are by their peers, and impact, how high a profile they have among their peers?”

Following this a second set of analyses were conducted using social status as categorical data. Based on the number of positive and negative nominations received, the sociometric classifications of popular, rejected, neglected, controversial or average were determined. Sociometric classification was then used as a criterion variable. Chi-squares were then

conducted to ask the question: “Are sociometric classification and centrality independent of each other?”

It was thought it would be important to ask both these questions because the relationship between salience and likability may be complex and require different analyses. Of specific interest was the relationship between salience of children and how well liked and impactful on peers they were. In addition, the general overall relationship between likability and salience was of interest.

Research Question Analyses

Overall, the analyses that were conducted were initially broken down by gender as an exploratory search to identify possible gender differences in the relationship between sociometric status, group centrality and individual centrality. A 3 x 3 x 2 Multivariate Analysis of Variance (MANOVA) was conducted with individual centrality (nuclear, secondary, peripheral), group centrality (nuclear, secondary, peripheral), and gender (female, male) as the three independent variables and the standardized Social Impact and Social Preference scores as the two dependent variables (as the measures of sociometric status). A significant main effect for gender was found, $F(2, 356) = 4.535, p = .011$. Post-hoc analyses revealed that girls scored significantly higher than did boys on social impact ($M_{\text{girls}} = -.008, M_{\text{boys}} = -.374$), $F(1, 357) = 6.090, p = .014$. The main effect for gender was not significant with regards to social preference scores, $F(1, 357) = 1.151, p = .284, \eta^2 = .003, \text{observed power} = .188$. Overall, the 3-way interaction was not significant, $F(4, 714) = .717, p = .580, \eta^2 = .004, \text{observed power} = .232$. In addition, significance did not emerge for either the interaction between individual centrality and gender, $F(4, 714) = 1.561, p = .183, \eta^2 = .009, \text{observed power} = .485$. or for the interaction between

group centrality and gender, $F(4, 714) = 2.161, p = .072, \eta^2 = .012, \text{observed power} = .640$.

Therefore, as no interactions involving gender were significant, subsequent analyses did not include gender as a variable.

To answer the question about the relationship between Social Impact and Social Preference scores and the individual centrality, a 4 x 4 Multivariate Analysis of Variance (MANOVA) was conducted with individual centrality (nuclear, secondary, peripheral, not a member of a group) and group centrality (nuclear, secondary, peripheral, not a member of a group) as the two independent variables and Social Impact and Social Preference scores as the two dependent variables. Due to the apriori research question regarding individual and group centrality, the overall interaction was not required to be significant. Specific to the research question, the interaction between individual and group centrality for Social Impact was not significant, $F(4, 382) = 1.217, p = .303, \eta^2 = .013, \text{observed power} = .382$ nor was the interaction between individual and group centrality for Social Preference, $F(4, 382) = 1.881, p = .113, \eta^2 = .019, \text{observed power} = .569$. This indicated that there is no evidence of a difference for Social Impact or Social Preference scores at different combinations of group and individual centrality.

Since neither interactions emerged as significant, the main effects were examined. The main effect of group centrality was non-significant for both Social Impact, $F(2, 382) = 1.491, p = .226, \eta^2 = .008, \text{observed power} = .318$ and Social Preference, $F(2, 382) = .567, p = .568, \eta^2 = .003, \text{observed power} = .114$, indicating that there was no evidence of significant differences between the different group centralities on either of the dependent variables. Due to a lack of significance on this omnibus test, no post-hoc analyses were conducted.

Finally, significance was obtained for the main effect of individual centrality for both of the dependent variables. With respect to the Social Impact scores, an overall main effect for individual centrality was significant, $F(2, 382) = 4.004, p = .019$. Post-hoc analyses indicated that children who held nuclear positions within groups had significantly higher Social Impact scores than did children who held peripheral positions ($M_{\text{nuclear}} = .149, M_{\text{peripheral}} = -.447$). In addition, children who were not members of a group had significantly higher Social Impact scores than did children who were peripheral members of a group ($M_{\text{not-member}} = .228, M_{\text{peripheral}} = -.447$). In other words, children who are nuclear members of a group and children who do not belong to a group make more of an impact on their peers than do children who hold peripheral membership in a group.

With respect to the Social Preference scores, an overall main effect for individual centrality was significant, $F(2, 382) = 4.590, p = .011$. Post-hoc analyses indicated that nuclear children had higher Social Preference scores than the secondary children ($M_{\text{nuclear}} = .010, M_{\text{secondary}} = -.411$). In addition, the children who were not a member of a group had lower Social Preference scores than did all of the other children ($M_{\text{not-member}} = -1.034, M_{\text{nuclear}} = .010, M_{\text{peripheral}} = -.007, M_{\text{secondary}} = -.411$). This indicates that peers prefer children who hold nuclear positions over those who hold secondary positions within a group. Furthermore, peers like all other children more than they like those who are not a member of a group.

It is interesting to note that those children who do not belong to a group make a significant impact on their peers and are more disliked than all other children. In addition, children who hold nuclear positions within a group make more of an impact and are more liked than other group members.

Sociometric Status and Social Network Descriptives

Initial analyses indicated that of the 392 participants in this study, 53 (13.5%) were popular, 60 (15.3%) were rejected, 28 (7.1%) were controversial, 52 (13.3%) were neglected, 53 (13.5%) were average, and 146 (37.2%) were sociometrically unclassified. These findings are generally consistent with other studies (Coie & Dodge, 1983; Kupersmidt & Coie, 1990).

Assessments of the social cognitive maps of the 392 participants in this study indicated that 171 (43.6%) children belonged to a nuclear group, 166 (42.3%) belonged to a secondary group, 36 (9.2%) belonged to a peripheral group and 19 (4.8%) did not belong to a group. Two hundred and thirty-two (59.2%) of the children held nuclear positions within their group, 115 (29.3%) were secondary members, 26 (6.6%) were peripheral members, 9 (2.3%) were isolated, and 10 (2.6%) were not nominated by their peers. When scores for the overall social network centrality were examined, it was found that 101 (25.8%) children had high overall centrality scores, 215 (54.8%) had median scores and 76 (19.4%) had low scores.

Overall, 76 groups of children were identified comprised of 373 children (19 children did not belong to a group). These groups ranged in sizes from 2 children to 26 children with a mode of 5, a median of 7 and a mean of 7.66.

Overlap Between Social Network and Sociometric Status

Details pertaining to the network positions of children of differing social status were determined. With respect to *group centrality*, 22 popular children (41.5% of popular children) were members of a nuclear group, 25 (47.2%) were members of a secondary group and 6 (11.3%) were members of a peripheral group. Seventeen rejected children (34% of rejected children who belonged to a group) were members of a nuclear group, 24 (48%) were members of a secondary

group and 9 (18%) belonged to a peripheral group. Of the controversial children, equal numbers were members of nuclear and secondary groups ($n = 13$ (46.4% of controversial children)) while 2 (7.1%) were members of a peripheral group. In addition, it can be seen that neglected children 20 (40.8% of neglected children) were members of a nuclear group, 26 (53.1%) belonged to a secondary group and 3 (7.1%) belonged to a peripheral group.

With respect to *individual centrality*, popular children were always members of a group. Furthermore, 41 of the popular children (77.4% of popular children) were nuclear members of their group, 9 (17%) were secondary members and 3 (5.7%) were peripheral members. While rejected children were not always members of a group (10 children (6.7% of rejected children) did not belong to a group), 29 (48.3%) were nuclear members of their group, 17 (28.3%) were secondary members and 4 (6.7%) were peripheral members. Controversial children were only represented as nuclear members ($n = 24$ (85.7% of controversial children)) and secondary members ($n = 4$ (14.3%)) of their group. With respect to neglected children, 19 (36.5% of nuclear children) were nuclear members of their group, 25 (48.1%) were secondary members, 5 (9.6%) were peripheral members and 3 (5.8%) were not members of a group. Of particular interest was the finding that all of the children who were identified as being popular, controversial or average were members of a group while some of the rejected and neglected children were not members of a group.

Overall network centrality scores were also examined with respect to the overlap between social networks and sociometric status. Overall network centrality is a general measure of centrality determined by both the individual centrality and group centrality. Sixteen popular children (30.2% of popular children) had high scores, 28 (52.8%) had median scores and 9 (17%)

had low scores. Ten rejected children (16.7% of rejected children) had high scores, 28 (46.7%) had median scores and 22 (36.7%) had low scores. Twelve controversial children (42.9% of controversial children) had high scores, 14 (50%) had median scores and 2 (7.1%) had low scores. Finally, 6 neglected children (11.5% of neglected children) had high scores, 35 (67.3%) had median scores and 11 (21.2%) had low scores.

A comprehensive description of the overlap between group centrality, individual centrality, overall centrality and sociometric status can be seen in Tables 1, 2 and 3 respectively.

Centrality as a Function of Sociometric Status

For each of the sociometric status positions, four general analyses were conducted. First, to determine if there was a relationship between social status and group centrality, a chi-square was conducted between sociometric status (e.g., popular, rejected, controversial, neglected and average) and group centrality (nuclear, secondary, peripheral and not a member of a group). For the purpose of these analyses, due to low cell sizes, peripheral centrality and non-members were combined to form one group. This chi-square yielded significant overall results, $\chi^2 (10, N = 392) = 26.513, p = .003$.

Second, to determine if there was a relationship between social status and individual centrality, a chi-square was conducted between sociometric status (e.g., popular, rejected, controversial, neglected and average) and individual centrality (nuclear, secondary, peripheral and not a member of a group). This chi-square also yielded significant overall results, $\chi^2 (10, N = 392) = 39.747, p = .000$.

Third, to determine if there was a relationship between social status and overall social network centrality, a chi-square was conducted between sociometric status (e.g., popular,

Table 1

The Relationship Between Sociometric Status and Group Centrality

Sociometric Status	Group Centrality		
	Nuclear	Secondary	Peripheral/ Non-member
	Observed (Expected)	Observed (Expected)	Observed (Expected)
Popular	22 (23.1)	25 (22.4)	6 (7.4)
Rejected	17 (26.2)	24 (25.4)	19 (8.4)
Controversial	13 (12.2)	13 (11.9)	2 (3.9)
Neglected	20 (22.7)	26 (22.0)	6 (7.3)
Average	24 (23.1)	26 (22.4)	3 (7.4)

 $\chi^2 (10, N = 392) = 26.513, p = .003$

Table 2

The Relationship Between Sociometric Status and Individual Centrality

Sociometric Status	Individual Centrality		
	Nuclear	Secondary	Peripheral/ Non-member
	Observed (Expected)	Observed (Expected)	Observed (Expected)
Popular	41 (31.4)	9 (15.5)	3 (6.1)
Rejected	29 (35.5)	17 (17.6)	14 (6.9)
Controversial	24 (16.6)	4 (8.2)	0 (3.2)
Neglected	19 (30.8)	25 (15.3)	8 (6.0)
Average	36 (31.4)	15 (15.5)	2 (6.1)

 $\chi^2 (10, N = 392) = 39.747, p = .000$

Table 3

The Relationship Between Sociometric Status and Overall Network Centrality

Sociometric Status	Overall Network Centrality		
	High	Median	Low
	Observed (Expected)	Observed (Expected)	Observed (Expected)
Popular	16 (13.7)	28 (29.1)	9 (10.3)
Rejected	10 (15.5)	28 (32.9)	22 (11.6)
Controversial	12 (7.2)	14 (15.4)	2 (5.4)
Neglected	6 (13.4)	35 (28.5)	11 (10.1)
Average	16 (13.7)	32 (29.1)	5 (10.3)

$$\chi^2 (10, N = 392) = 27.425, p = .002$$

rejected, controversial, neglected and average) and overall network centrality scores (high, median, low, not nominated).. This overall chi-square yielded significant overall results, $\chi^2 (10, N = 392) = 27.425, p = .002$. Finally, a chi-square was conducted to determine the relationship between sociometric status and individual centrality (nuclear, secondary, peripheral) at each level of group centrality (nuclear, secondary, peripheral). Once it was determined that the overall chi-squares were significant, the standardized adjusted residuals were examined for all sociometric status' of children.

Group Centrality. When examining the adjusted standardized residuals for group centrality, significance did not emerge for *popular* children. This indicates that popularity and group centrality are independent. In addition, an examination of the standardized adjusted residuals for group centrality indicated that *rejected* children were less likely to be members of a nuclear group, $z = -2.6$ (17 observed versus 26.2 expected) and were more likely to be members of peripheral groups or not members at all than expected by chance, $z = 4.3$ (19 observed versus 8.4 expected). Furthermore, when the adjusted standardized residuals were examined for group centrality, significance did not emerge for *controversial* children. This indicates that sociometric status and group centrality are independent for controversial children. Finally, when the adjusted standardized residuals were examined for group centrality, significance did not emerge for *neglected* children. This indicates that sociometric status and group centrality are independent for neglected children.

Individual Centrality. An examination of the standardized adjusted residuals for individual centrality indicated that *popular* children were more likely to be nuclear members of a group, $z = 2.9$ (41 observed versus 31.4 expected) and less likely to be secondary members of a group, $z = -$

2.1 (9 observed versus 15.5 expected) than expected by chance. In addition, an examination of the standardized adjusted residuals for individual centrality did not indicate any significant differences for *rejected* children. However, an examination of the standardized adjusted residuals for individual centrality indicated that *controversial* children were more likely to be nuclear members of a group than expected by chance, $z = 3.0$ (24 observed versus 16.6 expected) and less likely to be peripheral or non-members of a group than expected, $z = -2.0$ (0 observed versus 3.2 expected). Finally, an examination of the standardized adjusted residuals for individual centrality indicated that *neglected* children were less likely to be nuclear members of a group than expected by chance, $z = -3.6$ (19 observed versus 30.8 expected) and more likely to be secondary members of a group than expected, $z = 3.2$ (25 observed versus 15.3 expected).

Overall Centrality. When the adjusted standardized residuals of *popular* children were examined for overall centrality, significance did not emerge. In addition, an examination of the standardized adjusted residuals for overall network centrality indicated that *rejected* children were more likely to have low overall centrality, $z = 3.7$ (22 observed versus 11.6 expected). Furthermore, when the adjusted standardized residuals for overall network centrality were examined, significance emerged indicating that *controversial* children were more likely to have high overall network centrality than expected, $z = 2.1$ (12 observed versus 7.2 expected). Finally, the standardized adjusted residuals indicated that *neglected* children were less likely to have high overall network centrality than expected, $z = -2.5$ (6 observed versus 13.4 expected).

Sociometric Status and Individual Centrality at Each Level of Group Centrality. When the adjusted standardized residuals of the chi-squares pertaining to sociometric status and individual centrality at each level of group centrality were examined, no significance emerged for *popular*

children. In other words, there is no evidence that popular children are more likely to be nuclear members of nuclear or secondary groups as was hypothesized. In addition, the adjusted standardized residuals for the chi-squares pertaining to sociometric status and individual centrality at each level of group centrality did not reveal any significant differences for *rejected* children. Furthermore, an examination of the standardized adjusted residuals for sociometric status and individual centrality at each level of group centrality revealed that *controversial* children were more likely to be nuclear members of nuclear groups than expected by chance, $z = 2.5$ (12 observed versus 7.7 expected) and less likely to be secondary members of nuclear groups, $z = -2.2$ (1 observed versus 4.6 expected) than expected. The chi-squares for the secondary and peripheral groups were both non-significant, $\chi^2_{\text{secondary}} (2, n = 166) = 1.711, p = .425$; $\chi^2_{\text{peripheral}} (2, n = 36) = .706, p = .703$. Finally, an examination of the standardized adjusted residuals pertaining to sociometric status and individual centrality at each level of group centrality indicated that *neglected* children were less likely to be nuclear members of nuclear groups, $z = -2.8$ (6 observed versus 11.8 expected), more likely to be secondary members of nuclear groups, $z = 2.0$ (11 observed versus 7 expected), less likely to be nuclear members of secondary groups, $z = -2.8$ (10 observed versus 16.3 expected), and more likely to be secondary members of secondary groups, $z = 2.9$ (14 observed versus 7.8 expected) than expected by chance.

Additional Analyses. In addition to the general analyses conducted, a chi-square was conducted for rejected children to determine if they are less likely to belong to a group than their peers, as was hypothesized. A 2 x 2 chi-square was performed on sociometric status (rejected and non-rejected) and group membership (member, non-member). Of the 60 children who were identified as sociometrically rejected, 50 were members of a group while 10 were either isolated or not

nominated by their peers. It should be noted that while these two constructs are different (isolated, not nominated by peers), they both represented children who did not belong to a group. Furthermore, there were insufficient sample sizes in each of these categories to perform separate analyses therefore they were combined. This overall chi-square was significant, indicating that rejection and group membership are not independent, $\chi^2 (1, N=392) = 21.460, p = .000$. Examination of the standardized adjusted residuals indicated that rejected children were significantly less represented as group members than would be expected, $z = -4.6$ (50 observed versus 57.1 expected). Furthermore, rejected children were significantly more represented as non-group members than expected, $z = 4.6$, (10 observed versus 2.9 expected).

A subsequent ANOVA on aggression scores and group membership was conducted to determine if rejected children who belong to groups were more aggressive than those who do not belong to a group. Analyses indicated that there is no evidence of a difference in levels of overall aggression between rejected children who are members of a group and those who are not members of a group, $F (1, 58) = .003, p = .957, \eta^2 = .000, \text{observed power} = .050$.

In addition, ANOVA's were conducted on aggression scores and group membership to determine if more central children differed on aggression than less central children and if children in more central groups differed on aggression than children in less central groups. Overall, significance was found for both individual, $F (2, 373) = 3.760, p = .024$, and group centrality. $F (2, 373) = 9.122, p = .000$. For individual centrality, post-hoc analyses indicated that secondary children were more aggressive than nuclear children ($M_{\text{secondary}} = 23.634, M_{\text{nuclear}} = 18.107$). For group centrality, post-hoc analyses indicated that nuclear groups were more

aggressive than were secondary and peripheral groups ($M_{\text{nuclear}} = 24.446$, $M_{\text{secondary}} = 18.201$, $M_{\text{peripheral}} = 17.951$).

With respect to neglected children, in addition to the general analyses conducted, a chi-square was conducted to determine if they are less likely to belong to a group than their peers, as was hypothesized. A 2 x 2 chi-square was performed for sociometric status (neglected, not neglected) and group membership (member, not member) to determine if neglected children were as likely to be members of a group. Analyses did not reveal evidence that neglected children were less likely to belong to a group than expected, $\chi^2(1, N = 392) = .111, p = .739$.

In sum, it can be seen that children of differing social status positions are often of differing salience to their peers. Group centrality only appears to be related to rejected children while individual centrality appears to be related to most children.

Discussion

One of the main purposes of this study was to determine the extent of the relationship between social status and centrality. The results indicated that some aspects of centrality are related to social status, but not all.

In general, results indicated that individual centrality was related to social impact and social preference while group centrality was not. In other words, the impact that a child had on his/her peers (social impact) and how well liked that child was by his/her peers (social preference) was related to how well known a child was within a group (individual centrality) but not how high profile the child's group was (group centrality). This finding is not surprising considering the methodology behind the sociometric nominations. Children were required to identify their preference for individuals, not groups of individuals. In general, it seems that the

social status of a child was reflected in how well-known that child was within a group but was not related to how high profile his/her group was.

When the relationship was further examined, it was revealed that how much of an impact a child made on his/her peers (*social impact*) was related to all levels of individual centrality. This finding has face validity given that the social network information was based on the salience of individual children. A child was asked to write down all of the individuals in all of the groups that s/he could think of. A child who scored very low on impact (sociometrically) was quite likely not going to be remembered and identified as a group member as readily as another child whose social impact on peers was higher. Nuclear children are the most visible, or salient, with respect to social networks and this is related to the impact that these children have on peers in terms of how well liked they are. Secondary children are less visible than nuclear children yet more so than peripheral children. The social impact scores of the secondary children reflected this difference. Finally, peripheral children are less visible than their peers and this was reflected by significantly lower impact scores.

In contrast, how well liked a child was by their peers (*social preference*) was related to individual centrality only with respect to the difference between nuclear and secondary children, and the differences between the children who did not belong to a group (non-members) and those who did (members). In fact, children who did not belong to a group were the least liked of all of their peers. It is quite clear that children who do not belong to a group are especially disliked by their peers.

In sum, it seems that there was certainly an association between how well liked and how much of an impact children made on their peers, and how well known they were within their

social group. However, there was no evidence that this association existed with respect to how high profile their specific social group was within the larger social network.

In addition to the goal of determining the relationship between social status and centrality, one of the purposes of this research was to study the social networks of the children of differing social status'. To that end, the social networks of popular, rejected, controversial and neglected children were examined.

Popular Children. In this study there were two specific hypotheses with regards to popular children. First, it was hypothesized that children who were reported as being popular by their peers would be very well-known members of the groups to which they belong. This hypothesis was supported. Popular children were more likely to be nuclear members of a group (and less likely to be secondary members) than expected by chance. This finding is consistent with past research findings that nuclear children were often popular. Researchers who have examined the overlap between sociometrics and social networks have consistently found popular children to belong to social groups (Ladd, 1983; Farmer & Cairns, 1991) and be nuclear members of those groups (Farmer & Farmer, 1996; Farmer & Rodkin, 1996).

It was expected that children who were reported as being popular by their peers would also be identified as generally highly salient (overall network centrality). This hypothesis was not supported in the current study. Both individual and group centrality combine to create the overall network centrality scores. However, there was no evidence that popular children were more likely to belong to nuclear groups. Given that popular children were not more or less likely to belong to a particular centrality of groups, it is understandable why popular children did not have higher overall network centrality scores than expected compared to their peers.

In sum, it can be concluded that popular children were quite well known and high profile within their social groups. There did not seem to be any evidence, however, that the groups to which they belong were higher profile than those of less popular children.

Rejected Children. The first hypothesis for rejected children in this study was that they would differ from their peers with respect to both individual and group centrality. This hypothesis was partially supported in that they differed from their peers only with regards to group centrality. Rejected children were less likely to belong to a group than expected when compared to their non-rejected peers. Furthermore, when they did belong to a group it was less likely to be a nuclear group and more likely to be a peripheral group. However, there were no differences from their peers with respect to how high profile they were within their group. These findings support earlier research which concluded that rejected children spend more time alone or unoccupied on the playground than popular children (Ladd, 1983) and are not as likely to be members of a peer group (Farmer & Cairns, 1991). However, these findings are not consistent with those of Bagwell et al. (2000) who found that rejected children were less central members of a group than their peers. One possible reason for this difference is that these researchers obtained social network information based on only the classroom (rather than the whole grade). It is quite possible that children who are actively rejected by their classmates are more accepted by the grade as a whole and are members in somewhat non-central groups. Despite these findings, it is important to realize that many rejected children did belong to a group ($n = 50$, 83%) and many of those belonged to a nuclear ($n = 17$, 28.3%) or secondary group ($n = 24$, 40%).

It was also expected that rejected children would be identified by their peers as generally

less salient (overall network centrality) than expected. This hypothesis was supported. Rejected children were, in fact, more likely to have low overall centrality.

The findings for rejected children were especially interesting considering that this group of children were of particular interest in this research. By definition, rejected children are especially disliked by members of their own class. This research provides us with insight into where, in the broader grade structure, these children fit. In general, rejected children were less often members of a group than would be expected. Furthermore, when they were members of a group they tended to have lower centrality than expected. Rejected children are not completely shunned by their peers - in fact 50 of the 60 rejected children in this study were identified as a member of a group. However, more rejected children did not belong to a group than expected and those who were a member of a group had considerably lower overall network centrality scores.

The implications for this are quite meaningful. Rejected children were the only children who were more likely to be isolated or otherwise not belong to a group. This means that the children in their class do not affiliate with them nor do their non-classmate grade-mates. However, even though these children are quite disliked, the majority of them were perceived by their peers to affiliated with a group of peers. They tended to belong to non-central groups and were over-represented as members of peripheral groups.

In order to try to determine whether rejected non-group members differed behaviourally from rejected children who were identified as members of a group, level of overall aggression was assessed for these two groups. No significant differences in aggression were found. This

lack of significance could have been, in part, due to the low sample size. There were only 10 rejected children who did not belong to a group and the reported power was extremely low.

In order to have a reasonable sample size of children who do not belong to a group, those children who were identified as non-members of the groups by their peers (isolated) were combined with those children who were not nominated at all. Conceptually, it seemed that these were both groups of children who were isolated and not members of the larger social network. In retrospect, although these two groups may both be isolated, they may be non-members for different reasons. A trend was found indicating that rejected-isolated children were the least aggressive of the rejected children while the rejected-not nominated children were the most aggressive. This suggests that the rejected-isolates may be similar to the withdrawn isolated group identified by Rubin et al. (1994). In future, these two groups should be treated separately and a large enough sample should be utilized to address this issue.

In sum, rejected children were less often members of a group than would be expected. Furthermore, when rejected children belonged to a group, they were over-represented as members of peripheral groups. Despite these findings, the majority of rejected children did belong to a peer group. Finally, although there was no evidence of behavioural differences between those who were members of a group and those who were not, future research is needed to examine these sub-groups of rejected children.

Controversial. Controversial children were expected to be well known members of lower profile groups. This hypothesis was only partially supported. Controversial children were more likely to be nuclear members (and less likely to be peripheral or non- members) of their group but they were over-represented as nuclear members of nuclear groups. In addition, they were never

identified by their peers as not belonging to a group (isolated) or as a peripheral member of any group. Furthermore, only 4 (14.3%) of the controversial children were secondary members of a group. All of this evidence suggests that these children are very high profile members of very high profile groups. This finding leads us to ask why this might be the case. By definition, controversial children are highly liked by some of their peers and highly disliked by others. It is known that controversial children are often viewed as leaders by their peers, are generally disruptive (Coie et al., 1982), are highly aggressive and are as sociable as popular children (Newcomb et al, 1993). This past research indicates that, in all, these children are highly visible. Children would have a tendency to remember peers who are aggressive, social and leaders. Given this, it is understandable that controversial children would be nuclear members of nuclear groups. Future research should include measures designed to examine the characteristics of these high profile groups and the most salient members of these groups. In sum, controversial children appear to be very well known by their peers as do the groups to which they belong.

Neglected. The hypothesis for neglected children in this study was that they would be less well known members of lower profile groups or be isolated from the greater social network. The first part of the hypothesis was partially supported while the second part was not supported.

It was found that neglected children were more likely to be a secondary member of a group and less likely to be a nuclear member of a group than expected when compared to their peers. More specifically, neglected children were more likely to be secondary members of nuclear and secondary groups and less likely to be nuclear members of nuclear or secondary groups than expected. In general, neglected children had lower centrality than expected by chance.

Neglected children, however, were no less likely to belong to a group than members of other status groups. This is in contradiction with the findings of Farmer and Cairns (1991). They reported that rejected and neglected children were less likely to be members of a social group than other status groups. Their results were based on a very small sample size ($N = 19$) of non-normative children. In contrast, the present findings are based on a large, normative sample of children. In sum, while neglected children were not likely to be well-known members of high profile groups, they were as likely to belong to a social group as their peers.

Summary

In sum, there appears to be a relationship between social networks and sociometric status however this relationship seems to be different for different children and different groups of children. This relationship, for popular children, appears to be with respect to individual centrality. While popular children were not more likely to belong to a higher profile group, they were the children that other children were most aware of. In comparison, rejected children were more likely to belong to less salient groups. However, how well known they were within these groups was not related to their rejected status. The relationship between network centrality and sociometric status for controversial children occurs at both the individual and group level. These are highly visible and salient children in high profile groups. Neglected children, in contrast, had the lowest profile as members within a group and they were also members of groups that other children were least aware of. Within the larger social network, as within their classroom hierarchy, they were very much over-looked by others.

In light of the goals and findings of the current study, it was especially interesting to see that recent research conducted by Gest, Graham-Bermann and Hartup (2001) also examined the

relationship between social network centrality, sociometric status and friendship. These researchers studied 205 students from Grades 2 and 3. Social network centrality information was collected using procedures similar to Cairns et al. (1985) with two major differences. First, they required the children to identify social groups from within their classroom (as opposed to from within their grade). In addition, without an explanation of their slight deviation from standard procedure, children with standardized scores *less than* $-.75$ were classified as having *low* network centrality, children with standardized scores *between* $.75$ and $-.75$ were classified as having *medium* network centrality and children with standardized scores *greater than* $.75$ were classified as having *high* network centrality. (Standard procedure as described by Cairns et al. (1985) used the cut-off points of the top 30% (nuclear), middle 40% (secondary), and bottom 30% (peripheral) of nominations to differentiate centrality.) Sociometric status was determined using the procedures of Coie et al. (1982). Reciprocated friendship information was collected by having children list their best friends (as many as they wanted) and the number of reciprocal friendships was calculated. Finally, information regarding the social behaviour of the children was collected by having children nominate their peers on an 18-item version of the Revised Class Play which were broken down into four sub-scales: peer-perceived social position, sociability-leadership, aggression-disruptiveness and sensitivity-isolation.

Of specific relevance to the current study, when examining the overlap between social network centrality and social status, results indicated that popular and controversial children were more likely to have high network centrality, rejected children were more likely to have low centrality, and neglected children were both more likely to have low centrality and less likely to have high centrality. The findings of Gest and colleagues (2001) pertaining to popular,

controversial and neglected children essentially support the findings of the present study.

However, despite these similarities, the findings of Gest et al. for rejected children were not supportive of the present study. Their findings indicated that rejected children were more likely to have low individual centrality. In the current study, rejected children were not found to be less central members of a group than their peers. They were, however, less likely to belong to lower centrality group.

One possible reason for this difference in the findings might be due to methodological differences in the two studies. Unlike standard practice, Gest et al. (2001) used slightly different criteria for defining the three different groups of centrality (low, middle, high). These differences will certainly affect the degree to which comparisons can be accurately made between this study and others who employ different methodology. Furthermore, Gest and colleagues used the classroom rather than the grade for the composition of the social networks. It is quite possible that children who are rejected by their peers within their class are accepted into the group of grade-mates from a different class and therefore more salient to these other children. A final possible reason for this discrepancy could be developmental. The children in the present study were older (Grades 4-6) than those in the study of Gest et al. (Grades 2-3). Finally, as Gest and colleagues did not include group centrality in their analyses, it is not possible to comment on the similarities with the present study for group centrality.

Finally, some of the analyses that Gest et al. (2001) conducted were going to be suggested in this present discussion when identifying potential future directions for research. These researchers conducted multiple regressions, and when the unique proportions of variance were examined, very interesting findings emerged with respect to network centrality and social

behaviour (as identified by the items of the Revised Class Play). Network centrality was positively and uniquely associated with being a good leader and every item on the aggression-disruption scale and negatively associated with sadness and feelings getting hurt easily. In other words, leadership and aggressive behaviour were related to high individual centrality.

Furthermore, liked most scores were not uniquely associated with any of the behaviours except those in the peer-perceived social position (everyone likes, has many friends, and (negative) trouble making friends) whereas liked least scores were uniquely associated with all of the behaviour scores. Both of these findings supports previous findings that aggressive behaviour does not necessarily act as a suppressor of centrality (Farmer & Rodkin, 1996). In fact, although aggressive children are likely to be identified as least liked by classmates, these children are very salient to peers and are very likely to be nuclear members of a group.

Limitations of the Present Study

In considering the findings of the present research, it is important to keep in mind some of the limitations of this study. The SCM procedure essentially is a measure of the salience of individuals and the groups to which they belong. The hypotheses of this study were generated through the thinking that highly aggressive children would be central in groups that are not the most central but this thinking was flawed. The term “central” was interpreted, on my part, to mean more than it actually does. There is no part of the SCM measure that reflects whether the individual or group is popular, liked or influential - it simply reflects how well known the individual or group is. Children or groups of children can be well known for either prosocial or aggressive reasons.

In addition to this conceptual limitation, this study would have benefitted from a larger

sample size. Some of the very specific analyses that were conducted with sub-groups of rejected children did not yield significant results yet, as the analyses indicated, the observed power was fairly low, indicating the need for a larger sample size. One such example is the analysis involved in examining the behavioural aggression differences between rejected children who were not a member of a group and those who were. In this study, there were only 10 rejected children who did not belong to a group and the observed power was quite low (*observed power* = .050). This results from this analysis might have been different if the number of rejected non-members had been larger, which would require a larger overall sample size.

Future Directions

In future, it would be of interest in examine the overlap of sociometrics and social networks and include a measure of the impact each specific social group has on other groups or the popularity or likability of each social group (rather than simply the salience of the group). At the present time there does not seem to be a tool available to measure the children's perceptions of the different social groups or the impact or popularity of specific groups of children. It would be quite informative to measure the quality of the relationships within peer groups using a measure similar to the Friendship Quality Questionnaire (Parker & Asher, 1993) that taps into various aspects of the quality of the group relationships in terms of companionship, intimacy, etc. It would be quite useful to begin by asking children to complete the SCM measure. Based on that information, the children could be asked about their perceptions of the other members of their group. In addition, children could comment on the hierarchy within their group - who is the head of their group and who follows. Information about the influence and popularity of different children within the specific group could help identify specific functions or roles that different

children might play within the social group. In addition, children in one group could be asked about their impressions of the other groups with respect to influence. Children would likely be able to identify a hierarchy of groups in their grade and also a hierarchy of children within their own particular group. Such a tool would expand our understanding of the social lives of preadolescent children. Finally, the racial and ethnic diversity within children's social groups could be examined to determine if racial minorities are affiliating together within their own groups.

In conclusion, the present study served to deepen our understanding about the relationship between children's social status and the peer groups to which children belong. There is much evidence that shown that children rely heavily on their peers for support and companionship. Having a more complete understanding of the affiliations children have with their peers provides us with insight into powerful influences in their lives. This study indicated that how well liked or disliked children are is related to how salient they (but not their social groups) are to their peers. Of particular interest in this study were the peer groups of rejected and neglected children. While rejected children were more likely to be isolated than their peers, the same was not true for neglected children. Furthermore, the majority (almost 85%) of rejected children were identified by their peers as belonging to a social group and there was no evidence that these children were more or less aggressive than the rejected children who did not belong to a social group. In the future, it would be of interest to examine children's perceptions of the impact different group members have on others as well as the influence that their group has on other groups. Such research would further broaden our understanding of the impact and influence that peers have on children's lives.

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Appendix A: Ethical Consideration

Some researchers have raised concerns about the potential harm that may be caused to children by using bidimensional sociometric nominations (Asher & Hymel, 1981; Hayvren & Hymel, 1984; Newcomb & Bukowski, 1983). The differences between information provided by the peer rating scale and the two nomination measures require researchers to weigh the benefits of each method before deciding upon the measure that they will employ. It has been argued that while rating scales and unidimensional nominations do not provide the depth of information that is provided by bidimensional nominations, these two measures also do not share in the potential harm that the bidimensional nominations possess (Foster, Bell-Dolan & Berler, 1986). Peery (1979) commented on the potential problems involved with requiring children to express their personal dislikes about another child. In addition, Newcomb and Bukowski (1983) stated that early sociometric measures tended to be unidimensional to avoid the ethical concerns of children being permitted to label others (and be labeled) as disliked.

Although concerns have been expressed with regard to children negatively identifying others, the limited research that has been conducted has consistently shown that there is no obvious harm done to children due to these bidimensional nominations (Bell-Dolan, Foster & Sikora, 1989; Hayvren & Hymel, 1984; Iverson, Barton & Iverson, 1997; Iverson & Iverson, 1996). In 1984, Hayvren and Hymel conducted an analysis of risk to children participating in negative nomination tasks. They obtained positive and negative nominations from 27 pre-school children as well as a rating scale measure. They also obtained behavioural observations before and immediately after children completed the sociometric tasks. Results indicated that there were no differences in the children's interactions with peers between the two times that the

sociometric data was collected (pre and post).

Bell-Dolan, Foster and Sikora (1989) also examined the effects of sociometric testing on children's behaviour and loneliness. In their study, 23 fifth-graders were required to complete either a bidimensional sociometric nomination task or a control task. Their interactions with peers in general and with close friends were rated by trained observers. In addition, the children completed questionnaires to provide information on their mood and degree of loneliness. Overall, the analyses revealed that there were no mood or loneliness differences between children who completed the sociometric nominations and those who completed a control task for any of the dependent variables.

In 1992, Bell-Dolan, Foster and Christopher re-addressed the issue of potential harm caused by positive and negative sociometric nomination tasks. In this case, the researchers asked 232 girls from Grades 3 through 5, and their parents and teachers to report on their reactions to the study, student behaviour changes, and information shared with others about the sociometric measures after completing either the sociometric task or the control task. Students generally reported enjoying the tasks, did not report negative feelings about participating in the study or about any specific questions in the task, and parents and teachers reported no behaviour changes in the students during the two weeks following participation.

Over a decade after initial results suggested children were not harmed by bidimensional sociometric nominations, the issue is still being discussed. Iverson and Iverson (1996) studied the longer-term effects of completing bidimensional peer nominations. They assessed the social status of 45 fifth grade children using both positive and negative nominations during the last week of school in June. Upon returning to school two months later, these children were

interviewed about their experiences with the sociometric nominations. Results indicated that even though many of the participants had discussed the measurement tool with their peers, there was no evidence that mean or teasing behaviour resulted nor did children report that feelings were hurt. In fact, some children reported increased sensitivity for the feelings of others during and after the nomination procedure. Participants indicated that they enjoyed the sociometric nominations although they did not like the negative nominations as much as they enjoyed the positive nominations. Overall, there was no evidence that harm resulted from completing the bidimensional nominations.

Finally, Iverson, Barton and Iverson (1997) conducted a study involving 119 fourth- and fifth-graders. These children were asked to discuss their feelings about completing the positive and negative sociometric nominations. It was hypothesized that none of the peer status groups would report harm associated with completing the sociometric measures. Again, conclusions were drawn that negative nominations do not pose any greater risk of harm than children might encounter during the course of a regular day.

Although there are relatively few articles in the literature concerning the ethics of bidimensional nominations, the findings tend to be in a positive direction. That is, children, parents and teachers agree that children do not seem to be harmed by completing positive and negative nomination measures of sociometric status. Given the findings of this small body of literature, it is understandable that researchers continue to collect sociometric status information from children using bidimensional nominations.

Appendix B: Frequency Distributions of Consent Rate by Classroom

Classroom	Consent rate	Percentage
1	27/31	87%
2	21/26	81%
3	22/30	73%
4	22/27	81%
5	26/31	84%
6	22/29	76%
7	25/31	81%
8	17/22	77%
9	20/23	87%
10	17/20	85%
11	16/27	59%*
12	24/28	86%
13	22/26	85%
14	22/26	85%
15	7/25	28%*
16	21/25	84%
17	16/24	67%*
18	16/26	62%*
19	16/25	64%*
20	25/29	86%
21	14/20	70%
22	20/22	91%
23	17/21	81%
24	10/19	53%*
25	21/23	91%
26	15/28	54%*

* Classes that were not included in the analyses due to inadequate consent rates.

Appendix C: Sociometric Nominations

1. List up to three kids who you especially like to spend time with from your class.

2. List up to three kids who you least like to spend time with from your class.

Appendix D: Social Cognitive Map Procedure

Instructions to Students for Social Cognitive Map Procedure

We would like to know more about who hangs around with each other in your grade.

On your next two sheets of paper, please write down the names of all the people from your class or grade who hang around together. Some kids may hang out with more than one group. If so, put their names down in all groups they hang around with. You should write kids first names only, unless there are two kids with the same first name, then you should also write the first initial of the kid's last name.

Make sure that you include yourself in any of the groups that you hang around with.

(Note: Children are provided with enough lines to write down 8 groups. They don't have to complete the 8 groups if they can only think of 3 or 4. If they have more than 8 groups, have them turn the paper over and continue listing groups of kids on the back.)

Write down the names of all the people from your class or grade who hang around together. Some kids may hang out with more than one group. If so, put their names down in all groups they hang around with. You should write kids first names only, unless there are two kids with the same first name, then you should also write the first initial of the kid's last name. Make sure that you include yourself in any of the groups that you hang around with.

Group A

Group B

Group C

Group D

Group E

Group F

Group G

Group H

Are there any people in your class or grade who don't hang around with a particular group? Please list their names below.

Appendix E: Ratings of Children's Social Behavior - Teacher Form
(Crick, 1996)

Subscales	Items
Prosocial behaviour	1, 4, 8, 14
Overt aggression	3, 6, 9, 12
Relational aggression	2, 5, 7, 10, 11, 13, 15

Ratings of Children's Social Behaviour - Teacher Form

Child's Name _____

Child's Sex: Male or Female?

Teacher's Name _____

Grade _____

		Never true				Almost always true
1.	This child says supportive things to peers.	1	2	3	4	5
2.	When this child is mad at a peer, he/she gets even by excluding the peer from his or her clique or play group.	1	2	3	4	5
3.	This child hits, shoves or pushes peers.	1	2	3	4	5
4.	This child tries to cheer up peers when they are sad or upset about something.	1	2	3	4	5
5.	This child spreads rumors or gossips about some peers.	1	2	3	4	5
6.	This child initiates or gets into physical fights with peers.	1	2	3	4	5
7.	When angry at a peer, this child tries to get other children to stop playing with the peer or to stop liking the peer.	1	2	3	4	5
8.	This child is helpful to peers.	1	2	3	4	5
9.	This child threatens to hit or to beat up other children.	1	2	3	4	5
10.	This child tries to get others to dislike certain peers by telling lies about the peers to others.	1	2	3	4	5
11.	When mad at a peer, this child ignores the peer or stops talking to the peer.	1	2	3	4	5
12.	This child tries to dominate or bully peers.	1	2	3	4	5
13.	This child threatens to stop being a peer's friend in order to hurt the peer or to get what s/he wants from the peer.	1	2	3	4	5
14.	This child is kind to peers.	1	2	3	4	5
15.	This child tries to exclude certain peers from peer group activities.	1	2	3	4	5

Appendix F: Parental Consent Letter and Consent Form

Dear Parents/Guardians,

As you know, recently there have been several instances in Canadian schools where serious bullying and aggression have led to tragic consequences. As individuals concerned about children and youth we find ourselves in the position of not really understanding how social relationships at school and in class develop and how such tragic consequences may occur. We are writing to ask your help by allowing your child to participate in a study what will increase our understanding of how children use aggression within their friendships and how the peer group may support or condone such behaviours. We are interested not only in the more obvious form of bullying and aggression, such as hitting and name calling, but also in more subtle but equally hurtful acts such as exclusion from the group or threatening to reveal to others' personal information.

This study will take place at the school your child attends during the month of May 2001. Teachers will be asked to complete a rating scale of children's social behaviour (e.g., this child is kind to peers; this child tries to dominate or bully peers). Children will be asked to complete a questionnaire identifying who their friends are, and who they like to play with. They will answer questions that examine the quality of the friendship of the person who they spend the most time with at school (e.g., my friend plays with me at recess; my friend tells secrets to other kids when he/she is mad at me). Finally, the children will be asked to list all the groups of children in their grade who associate with one another. The administration of these questionnaires will take at the most forty-five minutes of the children's class time. Scheduling of the administration of these questionnaires will be at the teacher's convenience to minimize interference with daily class routine.

This project has been approved by the Carleton University Ethics Committee, the Ottawa-Carleton District School Board, and the principal of your child's school. Study results will be reported in ways that ensure complete confidentiality and anonymity of individual participants, and will be reviewed only by the researchers. No school will be identified by name and results will not appear in any school records. For interested parents, general group results of the study will be made available once the data has been analyzed.

Participation in this study is completely voluntary and your child may choose to not answer any question as well as to withdraw at any time. Additionally, only students with written permission will be allowed to participate. Children will be encouraged to discuss any concerns with either their parents or teacher in addition to being provided an opportunity to talk with the school guidance counsellor or vice-principal. We will provide parents and teachers with a list of external resources and books that deal with bullying and aggression. Furthermore, should parents or teachers desire additional support or information an inservice session or material will be offered upon their request. We would be grateful for your cooperation. However, whether or not you wish to have your child participate in this study, please complete the attached form and

have your child return it by next week as we wish to be sure that you received this request. If you have any questions, please feel free to contact us at the number listed below. Should you have further concerns with regard to the ethics, please feel free to contact Dr. Monique Sénéchal, Chair, Department of Psychology Ethics Committee, 520-2600, ext. 1155). If you have other concerns please contact Kim Matheson, Chair, Psychology Department, 520-2600, ext. 2648. Thank you for your assistance.

Sincerely,

Linda Spence, M.A.
Ph.D. Candidate
Psychology Dept.
Carleton University
(723-2669)

Tina Daniels, Ph.D.
Assistant Professor
Psychology Dept.
Carleton University
(520-2600, ext. 2686)

CONSENT FORM

The information collected for this project is confidential and protected under the Municipal Freedom of Information and Protection of Privacy Act, 1989

I have read and understand the request for my son/daughter to participate in the study of the dynamics of children's peer relationships. I have discussed it with my son/daughter and:

I give permission for my child to participate.

I do not give permission for my child to participate.

Date: _____

Name of Child: _____ Age: _____
(please print)

Name of Parent or Guardian:

(please print)

Signature of Parent/Guardian: _____

Please have your child return the signed consent form to school by next week. Thank you.

Appendix G: Oral Debriefing for Children

I would like to thank you very much for helping us today. We know that some children get along really well, but that sometimes kids argue or are mean to other kids. What we are trying to find out is which children spend time together and how they get along with their close friends and other friends in their grade. If we can find out, then maybe we can find a way to help kids to get along better and be nicer to each other. The answers that you have given us will help us to do this. So, we want to thank you very much for sharing your thoughts and feelings with us today. The ideas that you have shared will be used to help other children in the future. I would like to remind you that we will not tell anyone about what you have said about them. Likewise, we are asking you to not discuss your responses with other children.

Filling out these surveys may have raised some concerns. Do you have any questions or is there anything anyone would like to talk about? (If children raise their hands, then add the caution that they are not to mention anyone's name). If you would like to talk about something we discussed today you can talk either to your parents or your teacher. They have also been given a list of other people who may be helpful in answering some of your questions or concerns. Also, if you would like to talk to the school guidance counsellor, Mr. Spence in private, you can fill out one of these forms (show form) that will be left on your teacher's desk (or place agreed upon by teacher). Just return it to your teacher within the next couple of days and then arrangements will be made.

Self-Referral Form:

I would like to talk to the school guidance counsellor about some of the things we were asked questions about.

Name: _____

Appendix H: Debriefing Letter for Parents

Dear Parents/Guardians,

We would like to take this opportunity to thank you for permitting your child to participate in this study of children's social networks. While a good deal is known about the positive aspects of children's friendships, little is known about the organization of and support provided by friends and how conflict is handled within the social network.

We anticipate that the information gained from this study will provide researchers with a better understanding of preadolescents' friendships and affiliations within the larger social network (e.g., how friends support one another, how conflict is minimized).

All of the individual children's responses will be kept confidential but, if you have any further questions about this study, please feel free to contact us at the numbers listed below. There was an opportunity at the end of the session for children to ask any questions. Children have also been provided with the opportunity to discuss any specific concerns with the school guidance counsellor. Furthermore, they have been encouraged to discuss any concerns with their parents and/or teacher. Attached you will find a list of external resources that deal with bullying and aggression. Should parents or teachers desire additional support or information an inservice session or material will be offered upon request. Should you have any further concerns regarding ethics, you may contact Dr. Monique Sénéchal (Chair, Department of Psychology Ethics Committee, 613-520-2600, ext. 1155) or Dr. Kim Matheson (Chair of the Department of Psychology, 613, 520-2600 ext. 2648).

Thank you once again for your participation.

Sincerely,

Linda Spence, M.A.
Ph.D. Candidate
Psychology Dept.
Carleton University

Tina Daniels, Ph.D.
Assistant Professor
Psychology Dept.
Carleton University
520-2600, ext. 2686

List of Agencies/Resources

- Community Resource Centre of Goulbourn, Kanata and West Carleton, 591-3686
- Nepean Resource Centre, 596-5626
- Pinecrest-Queensway Health and Community Services, 820-2001
- Youth Services Bureau of Ottawa-Carleton, 729-1000
- Kids Help Phone - Crisis (800) 668-6868

Books/Articles for Adults

Paul, Henry A. *When Kids Are Mad, Not Bad: A Guide to Recognizing and Handling Your Child's Anger*. Berkley Publishing Group, 1999. Pointing out that anger may underly many behavior problems of children, shows parents how to detect hidden anger.

Kreidler, William J. "When Anger Rears It's Ugly Head." *Instructor Magazine*, April 1996, p.24. Anger-management concepts for helping kids who heat up with anger cool down.

Marano, Hara Estroff. "Big, Bad, Bully." *Psychology Today*. Sept. 1995, p. 50. The psychology behind bullying and what children and parents can do to handle bullies or avoid bullying behaviour.

Videos for Teachers

Friendship: The Good Times ... The Bad Times - 22 minutes. Friendship takes on an increasingly important intensity and significance during the growing-up years of puberty. Program helps students understand that changes in friendship are common at this time, and that when a friendship dissolves, the best thing to do is to find new friends who share similar values and interests. Vignettes and open-ended questions stimulate class discussion about loyalty and responsibility in friendship.

Real People - Cliques: Who's In? Who's Out? - 24 minute video, teacher's guide. Using true-to-life scenarios, program explores the nature of cliques, focusing on the kinds of group dynamics that cause heartache and anxiety as well as on friendship groups.

Books for Children

Cole, Joanna. *Bully Trouble*. New York: Random House, 1989.

Carlson, Nancy. *Loudmouth George and the Sixth Grade Bully*. New York: Puffin Books, 1983.

Fitzhugh, Louise. *Harriet the Spy*. New York: HarperCollins. Harriet faces conflicts with her friends when they discover what she wrote about them in her notebook.