Disability and social network.
A comparison between children and adolescents with and without restricted mobility.

By Lisa Skär and Maare Tamm

Abstract: The purpose of this study was to compare the social network (with particular emphasis on roles, relationships and activities) of school children and adolescents with restricted mobility (investigated group) with the social network of non-disabled school children and adolescents (comparison group). The group investigated consisted of 23 children and adolescents aged 7 to 19 years from northern Sweden. The results were compared with a group of 23 children and adolescents matched for age and gender from the same area. The children and adolescents were individually interviewed using the instrument "My social network." The results showed that children and adolescents with restricted mobility had considerably fewer peers in their social network. Furthermore, these differences were greater among the adolescents. A plausible interpretation of these results is that there is a clear association between the number of peer relationships, accessibility to different surroundings and the possibility to perform various activities. How a social network that consists of members of the same age group affects children with restricted mobility is discussed according to Bronfenbrenner's ecological theory and the perspective of Oliver's (1996) social model of disability.

In this article we studied the social network of children and adolescents with restricted mobility and their perceptions of important relationships in their lives. Research on children with physical disabilities has shown that these persons have difficulty in making or keeping friends and are seldom spontaneously initiated in the play of other children (Missiuna and Pollock, 1991; Mulderij, 1996, 1997; Tamm & Skär, 2000). Children with physical disabilities are often excluded from peer groups in a variety of settings, including school and different types of leisure activity (Missiuna & Pollock, 1991, Mulderij, 1997; Prellwitz & Tamm, 2000). Furthermore, there is evidence that children with restricted mobility have limited possibilities to visit new settings because of the physical and psychosocial barriers imposed by these settings (Butler, 1984; Campos & Barenthal, 1987; Diamond et
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al., 1993). These barriers are partly due to the construction of mobility aids, which has made it difficult to use the aids in all settings, but they are also related to the fact that children with severe motor dysfunction are simply not accepted by their peers.

Moreno (1953), founder of the theories of psychodrama, socio-drama and sociometry, was one of the first to use the term 'social network'. However, already earlier, Kurt Lewin and George Herbert Mead had noted the importance of increased understanding of environmental factors and their influence on the social network of individuals. In the 1930s, Lewin (1951) developed his field theory, a theory that emphasised the influences of the immediate environment on the behaviour of the individual. Mead (1934) showed that a large part of a person's identity is formed by his or her roles in society and upheld through interaction with others.

During the 1970s, many researchers studied the interaction between environmental and interpersonal processes. Inspired by both Lewin and Mead, Urie Bronfenbrenner (1979) developed a model of the ecological environment (The ecology of human development). According to Bronfenbrenner, the child’s primary environment is his or her family, which forms part of a microsystem, which includes the complex of relationships between the developing person and the immediate environment. Other microsystems of the child could include the child’s day-care centre, school, recreation centre, peer groups and other groups in the child’s social network. The older the child, the more complex becomes the child’s microsystem. For the child’s development, contact and communication with important persons in different microsystems are extremely important. This contact can be in the form of performing activities together, talking with each other and passing on important information to persons in other microsystems. If these contacts exist, this can give the child important links when entering new settings, which is especially intensive during the teenage process of liberation. During adolescence, the adolescent establishes social relationships in new contexts, i.e. new social networks are created. Through these networks, teenagers gain access to relationships outside the nuclear family and their immediate circle of friends. The adolescent is perhaps in a stage of development when it is most evident that the creation of a social network is of crucial importance to future development (cf. Svedhem, 1991).

Bronfenbrenner’s model focuses on how “ordinary” children and adolescents (i.e. persons without disabilities) interact with other persons (e.g., friends, peers, teachers and family members) in numerous environments (i.e. different Microsystems) and how such interactions (or lack of them) influence these persons. The problems that children and adolescents with disabilities encounter
are slightly different from those of persons without disabilities. Michael Oliver (1996) recently developed a social model of disability. His model is similar to Bronfenbrenner's in that it, too, describes the individual's interaction with other persons in different environments. However, it differs from Bronfenbrenner's in that the model focuses on disabled people. According to this model, it is society that disables physically impaired people. It is the immediate environment that makes it difficult for individuals, such as disabled children and adolescents, to get about in their surroundings. It is these inaccessible settings that restrict the activities of persons with physical disabilities, especially persons with profound disabilities. Transportation problems can prevent the disabled persons from going out as often as they would like. Thus, the model asserts that society and its organisations take little account of persons with disabilities, excluding them from participation in the mainstream of social activities.

Today, there is fairly extensive research that concentrates on two aspects of children's social network: one aspect describes the importance of the social network to children's development and health while the other addresses children's mental ill-health and social adaptation. Findings concerning the first aspect indicate how important it is that the social network should contain other persons (other adults, siblings and friends) that the child can turn to for practical and emotional support as well as general feedback. It also shows that the social network is important for the child's health and well being (Furman & Buhrmester, 1985; Bö, 1989; Cochran & Bö, 1989; Cassidy & Asher, 1992). Research within the other area, i.e. research on children's mental ill health and social adaptation (Svedhem & Swaling, 1989; Svedhem, 1991) indicates that children with behavioural problems (children who are aggressively extroverts and/or show much anxiety) have a fragmented and/or sparse social network. The implication is that these children not only have fewer adults and groups (e.g., family, relatives, friends, schoolmates and neighbours) in their social network but also that the networks contain a smaller number of connecting links between the different groups.

With mental ill health as a starting point, the psychologists Aresik-Ram and Elf developed an instrument they called "My social network" (Aresik-Ram & Elf, 1997). To date, the instrument has been used only in a therapeutic context (i.e. it has not been used as a tool in research), with the purpose of systematically setting children's situations in a network perspective. Another purpose of the tool is to use structured conversations with children to contribute to knowledge of how they perceive important relationships in their lives.

There are few studies on the social network of children with restricted
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mobility. In one of the few published studies Ellerton et al. (1996) found that children with spina bifida became socially isolated from friends, which the authors felt was related to limitations of movement that was caused by their functional disability. This forced social isolation meant that the children experienced loneliness and a condition related to emotional or mental stress. In contrast, there are several studies on children with chronic illnesses (cystic fibrosis, asthma and cardiology) and their social networks (Zeltzer et al., 1980; Spirito et al., 1991; Ellerton et al., 1996). The results of these studies are consistent in showing that chronic illness can result in a sparser social network and a profound limitation on contacts with friends. These children in general also had a smaller number of friends in their social network in comparison with healthy children. With this background, the primary purpose of this study was to use Aresik-Ram and Elf’s instrument to compare the social network (with particular emphasis on roles, relationships and activities) of children and adolescents with restricted mobility with the social network of non-disabled children and adolescents.

Method

Subjects
Totally, 23 children (11 girls and 12 boys) with restricted mobility (target group), integrated in ordinary schools, participated in the study. They ranged in age from 7 to 19 years. The child with restricted mobility was defined as a person unable to move without a wheelchair, walking frame or other walking device. In setting this criterion, the selected children came to represent the following medical diagnoses: spina bifida, cerebral palsy, muscular dystrophy and polio syndrome. In addition, the children were required to have the capacity to respond to questions in the interview. These inclusion criteria, restricted mobility and good verbal communication skills, placed a limitation on the number of children that could take part in the study. Thus, we studied all children and adolescents with good verbal skills and with restricted mobility for all residents of two adjacent medium-sized municipalities in the north of Sweden during the year of 2000 and 2001.

The comparison group was made up of 23 schoolchildren with no physical disabilities. The children in the two groups (investigated and comparison) were matched on age (born in the same year and month) and gender. Children and adolescents in the comparison group attended ordinary schools of the same size and in the same two municipalities in Northern Sweden as those in the investigated group.

The children in the two groups were further divided into two age groups: age group 1 consisted of 10 children aged 7-12 years (mean age 9.92 years), and age group 2 was made up of 13
adolescents aged 13-19 years (mean age 17.42 years). This division was made because the development of more intense relationships with peers typifies adolescent years, which, in turn, influences the size and quality of their social network.

The children with restricted mobility were selected with the assistance of the chief physician in charge of the Children's Rehabilitation Centre. For the comparison group, the headmaster of the schools in the two municipalities selected the children on the basis of the criteria described above. After the selection process, the chief physician and the headmaster sent a letter to the parents of the selected children requesting permission to interview their child. The purpose of the study was presented in the letter, where each participant was informed that they were guaranteed confidentiality and could withdraw from the study at any time. The parents of the children that accepted the invitation to participate in the study then contacted the researcher in order to set up an appointment for the interview. The project was approved by the ethics group at the Department of Health Sciences, Luleå University of Technology.

Instrument
All components of the Aresik-Ram and Elf instrument were used, except the section on conflicts, which is used only in clinical settings. The instrument was designed to analyse the social network of children aged from 7 years up to the late teens (Aresik-Ram & Elf, 1997). The instrument was developed within a clinical and therapeutic context and has been used to evaluate therapeutic conversations. The instrument consists of a network map listing all persons the child/adolescent knows, placing them in six sectors (family, relatives, schoolmates, friends, neighbours and professionals). In addition to the network map, the instrument comprises five question domains: intensity, practical support, emotional support, feedback and multiplexity. In the area of intensity the questions concern how important the child/adolescent perceives different persons in his or her social network. In the domains practical and emotional support, the questions address which network members the children/adolescents perceive themselves as receiving practical and emotional support from, and to which members the children give practical and emotional support. The feedback domain deals with which persons the child/adolescent feels give positive or negative reinforcement. Multiplexity refers to whether the interaction between the interviewed person (child/adolescent) and network members takes place based on more than one content, i.e. does the child carry out several significant activities with the persons in question?

Administrative procedure
All children and adolescents were individually interviewed at school by the first author following the result
sheets for the instrument. The interviews, which took between 1 and 1.5 hours, started by asking the children/adolescents to list which people they knew best and met almost daily. At this time, the respondents were also asked to draw a social network map. The respondents were told that they could name as many people as they wished. Next, they were questioned about how they perceived important relationships to the people in their social networks, following the interview instruments five question domains comprising 28 questions.

Results

The results are presented as a function of age groups (children and adolescents) in the investigated and comparison group but not in regard to gender because there were no significant differences. An initial overview is provided of the structure of the social network and the network members in the six sectors of the network map. These data are depicted separately for children (Figure 1) and adolescents (Figure 2). As indicated in Figure 1, the structure of the social network differs between disabled and non-disabled children. For children with restricted mobility, the number of network members (n = 154) is smaller as compared with non-disabled children (n = 218). For disabled children, 72 (46.8%) network members were children and 82 (53.2%) were adults; for the non-disabled children, 132 (60.6%) network members were children and 86 (39.4%) were adults. The pattern of the results indicates that the proportion of children in the social network is smaller for children with restricted mobility, whereas the proportion of adults is comparable between groups. The largest differences between disabled and non-disabled children are in the sectors schoolmates, friends and neighbours.

Figur 1. The number of network members in the six different sectors in the network map for the children.
As the children, the adolescents with restricted mobility have a smaller social network (n = 177) than the comparison group (n = 283) (Figure 2). For the adolescents with restricted mobility, 72 (40.7%) network members were adolescents and 105 (59.3%) were adults; for the comparison group, 174 (61.5%) network members were adolescents and 109 (38.5%) were adults. These results correspond to those in children; i.e. adolescents with restricted mobility have fewer peer contacts but about the same number of adult contacts as non-disabled adolescents. The largest differences between the investigated and comparison group are in the sectors of schoolmates, friends and neighbours, differences that are more pronounced in the adolescents as compared with younger children.

Below, the results for each of the five question domains (intensity, practical support, emotional support, feedback and multiplexity) are presented separately for children and adolescents.

**Intensity**

The results from the domain intensity show which persons the participants perceive as important. Important persons were described through relationships in a positive (e.g., a close friend giving practical or emotional support) or negative way (e.g., a person the participant was angry or disappointed with). Table 1 presents persons with whom children and adolescents perceive as important in their life.

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**Figure 2.** The number of network members in the six different sectors in the network map for the adolescents.
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Table 1. The number of children and adolescents who perceived someone in the sectors of the network map as important.

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<tr>
<th>Age group 1</th>
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<tbody>
<tr>
<td>(7-12 yrs)</td>
<td>Family</td>
<td>Relatives</td>
<td>Schoolmates</td>
<td>Friends</td>
<td>Neighbours</td>
<td>Professionals</td>
</tr>
<tr>
<td>With restricted mobility</td>
<td>10</td>
<td>9</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Comparison group</td>
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<td>8</td>
<td>5</td>
<td>9</td>
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<th>Age group 2</th>
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<tbody>
<tr>
<td>(13-19 yrs)</td>
<td>Family</td>
<td>Relatives</td>
<td>Schoolmates</td>
<td>Friends</td>
<td>Neighbours</td>
<td>Professionals</td>
</tr>
<tr>
<td>With restricted mobility</td>
<td>13</td>
<td>12</td>
<td>6</td>
<td>2</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Comparison group</td>
<td>13</td>
<td>12</td>
<td>3</td>
<td>5</td>
<td>12</td>
<td>3</td>
</tr>
</tbody>
</table>

The data in Table 1 indicate that the important persons for children and adolescents (with and without restricted mobility) are within the family. However, the table also shows that children and adolescents with restricted mobility have fewer important persons in the schoolmates and friends sectors.

One of the questions asked concerned whether the child had a best friend. The children's responses to this question are listed in Table 2.

Table 2. The number of children and adolescents in both age and comparison groups who have a best friend.

<table>
<thead>
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<th>Group</th>
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<tbody>
<tr>
<td></td>
<td>Have a best friend</td>
<td>Have no best friend</td>
<td>A child as a best friend</td>
<td>An adult as a best friend</td>
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<tr>
<td>Age group 1 (7-12 yrs)</td>
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<tr>
<td>With restricted mobility</td>
<td>10</td>
<td>9</td>
<td>1</td>
<td>7</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Comparison group</td>
<td>10</td>
<td>10</td>
<td></td>
<td>10</td>
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<tr>
<td>Age group 2 (13-19 yrs)</td>
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<tr>
<td>With restricted mobility</td>
<td>13</td>
<td>8</td>
<td>5</td>
<td>6</td>
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<tr>
<td>Comparison group</td>
<td>13</td>
<td>13</td>
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</table>
The table indicates a difference between the target and comparison group, with the greater difference existing in the adolescents. In the investigated group there were children and adolescents who did not have a best friend, whereas all those in the comparison group had a best friend. Another difference between the groups was that children and adolescents in the investigated group had adults (parents or the assistant) who served the role of best friend. Such a relationship was not observed in the comparison group, where everyone had a person of the same peer group as a best friend. Another question about relationships concerned the people the participants invited to their birthday party. Half of the children and adolescents with restricted mobility stated that they generally do not have birthday parties because they have no friends to invite. If they did invite people to their party, they reported feeling uncertain as to whether anyone would come. "I don't invite anyone because I don't know whether anyone would come." "I usually invite everyone I know but nobody comes." The other half of the children and adolescents with restricted mobility usually had a party on their birthday, where some of them invited their friends of the same age while others invited only adults (e.g., family members, relatives or the assistant). All the participants in the comparison group invited peers to their birthday party.

To the question regarding with whom they would like to make a long journey, the children and adolescents with restricted mobility replied that most of all they would like to travel with someone in the family (a parent or sibling) or a close relative (a grandmother or cousin). For some of the adolescents, even the assistant was a possible travelling companion. In the comparison group, half the children would prefer to travel with their best friend while the remaining half would favour someone in the family; if given the opportunity, all of the adolescents in this group would choose their best friend as a travelling companion.

Practical support
Within the domain practical support, the results show from which sectors in the network map the children could either receive or give practical support. Practical support is defined as different kinds of help in practical situations (e.g., assistance with housework or homework). The results are presented in Table 3.
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Table 3. The number of children and adolescents who perceived practical support from members of the six different sectors in the network map.

<table>
<thead>
<tr>
<th>The six different sectors in the network map:</th>
<th>Family</th>
<th>Relatives</th>
<th>Schoolmates</th>
<th>Friends</th>
<th>Neighbours</th>
<th>Professionals</th>
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<tr>
<td>Age group 1 (7-12 yrs)</td>
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<tr>
<td>With restricted mobility</td>
<td>10</td>
<td>10</td>
<td>3</td>
<td>1</td>
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</tr>
<tr>
<td>Comparison group</td>
<td>10</td>
<td>10</td>
<td>4</td>
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<tr>
<td>Age group 2 (13-19 yrs)</td>
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<tr>
<td>With restricted mobility</td>
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<td>13</td>
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<tr>
<td>Comparison group</td>
<td>13</td>
<td>13</td>
<td>4</td>
<td>1</td>
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</tbody>
</table>

The results in Table 3 indicate that all children and adolescents (with and without restricted mobility) gave or received practical support from the sector family. The children and adolescents’ responses in the investigated group indicated that the father helped with household repairs while the mother helped with matters related to homework. The responses of the participants in the comparison group were similar, but with one important difference, namely, that the children in the comparison group also gave or received practical support from their friends.

Furthermore, it was not common for children with restricted mobility to help others with practical matters. Several stated that nobody ever asked for their help. "I don't know who I can help. There is never anyone who asks me." This tendency differed from the children in the comparison group; in this latter group everyone assisted others with practical things and group members frequently helped their friends.

Another question, which described the children's relationships within the area practical support, was whether they could borrow things from others. Half the children and adolescents with restricted mobility and all those in the comparison group reported that they occasionally borrowed things from others. They borrowed similar things in both groups, mostly from peers, things such as toys, books and games. Those children and adolescents in the investigated group that did not borrow anything reported that they did not know to whom they could ask.

Emotional support

The questions regarding emotional support dealt with the network members from whom the children and
adolescents perceived themselves as receiving emotional support, i.e. persons who asked how they feel or showed interest in their activities and with whom they could discuss emotional issues. These results are given in Table 4.

As can be seen in Table 4, all the children and adolescents with restricted mobility felt that there was someone who cared especially for them (e.g., through asking how they feel or what they were doing). The emotional support was provided principally by someone in the family (parents or a sibling), but also by close relatives such as grandparents. The children and adolescents in the comparison group also felt that their friends and schoolmates gave emotional support, which was not so for the participants with restricted mobility.

Another question in this area concerned having someone the participants felt special trust towards in their social network. The participants’ responses indicated that few of the persons with restricted mobility had a confidant they could rely on. "I don't know. I don't think I have anyone to tell." Even when the participants felt afraid, most lacked someone they could confide in. "I never talk about things like that with anyone." "I have no one to whom I can discuss private matters with." Those few who said that they had a confidant reported this person to be their parent. In the comparison group everyone had someone they could confide in when they wanted to say something in confidence or when they were frightened. They also reported that they normally confided in their parents first, but also that their friends were always told eventually.

Table 4. The number of children and adolescents who perceived emotional support from members of the six different sectors in the network map

| Age group 1 (7-12 yrs) | The six different sectors in the network map: | | | | |
|------------------------|---------------------------------------------|-----------------|-------------|-------------|-----------------|-------------|
|                        | n | Family | Relatives | Schoolmates | Friends | Neighbours | Professionals |
| With restricted mobility | 10 | 10 | 3 | 1 | 4 |
| Comparison group | 10 | 10 | 2 | 5 | 4 | 1 |

| Age group 2 (13-19 yrs) | The six different sectors in the network map: | | | | |
|------------------------|---------------------------------------------|-----------------|-------------|-------------|-----------------|-------------|
|                        | n | Family | Relatives | Schoolmates | Friends | Neighbours | Professionals |
| With restricted mobility | 13 | 13 | 4 | 4 | 4 |
| Comparison group | 13 | 12 | 7 | 4 | 9 | 2 |
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**Feedback**
The questions on feedback deal with the persons in the social network that the participants perceive to provide reinforcement, i.e. persons that create relationships where the participants become worthy of attention (e.g., by taking time to listen what the participants have to say). The results also illustrate which persons the participants give their reinforcement. These results are summarised in Table 5.

The table shows that almost all of the persons with restricted mobility received reinforcement from their family. The comparison group, on the other hand, received reinforcement from persons in several network sectors, including peers. The data showed that all participants, except one child with restricted mobility, reported that they received praise from someone in their social network. The praise mainly came from the parents though it also came from the schoolteacher or the assistant. All the participants in the comparison group were also given praise by their parents, but unlike the children with restricted mobility, it was their friends who gave most approval and commendation.

Expressing admiration for someone else was done by only half of the participants with restricted mobility. The persons who received most praise were the same persons as those who gave praise (i.e. a parent, schoolteacher or assistant). Whereas only a few of the adolescents with restricted mobility reported expressing admiration for a friend, all of the adolescents in the comparison group reported giving some form of praise.

Table 5. The number of children and adolescents who perceived feedback from members or to which members they give feedback in the six different sectors in the network map

<table>
<thead>
<tr>
<th>The six different sectors in the network map:</th>
<th>n</th>
<th>Family</th>
<th>Relatives</th>
<th>School-mates</th>
<th>Friends</th>
<th>Neighbours</th>
<th>Professionals</th>
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<td><strong>Age group 1</strong> (7-12 yrs)</td>
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<tr>
<td>With restricted mobility</td>
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**Multiplexity**

Multiplexity provides a depiction of the relationship between the participant and persons in the network map. This relationship is expressed through a description of those activities they carry out jointly. The participants' multiplex relationships are displayed in Table 6.

The table shows that the participants with restricted mobility had fewer multiplex relationships as compared with the non-disabled participants. The differences in such relationships were most strongly observed in adolescents.

Multiplexity among children with restricted mobility entails performing several activities in conjunction with someone in the family (mother, father or sibling). These activities could be excursions to a summer cottage or a holiday trip. The comparison group performed multiple activities, mainly with peers, but also with others in their social network. Adolescents in the comparison group, for example, participated in various sports activities (e.g., football, ice hockey and basketball) several times a week. They had a strong bond with members of these groups, often spending time together outside the normal group activities (e.g., going to the cinema or discotheque).

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**Table 6. The number of children and adolescents who perceived multiplex relations between members and themselves of the six different sectors in the network map**

<table>
<thead>
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<th></th>
<th>The six different sectors in the network map:</th>
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<tbody>
<tr>
<td></td>
<td>n</td>
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<tr>
<td><strong>Age group 1</strong></td>
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<tr>
<td>(7-12 yrs)</td>
<td></td>
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<tr>
<td>With restricted</td>
<td>10</td>
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<tr>
<td>mobility</td>
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Discussion

The results of this study convincingly demonstrate that children and adolescents with restricted mobility had considerably fewer peers in their social network in comparison with non-disabled children and adolescents. Furthermore, the findings revealed that these differences tended to increase with age. The number of adults in the network map was about the same for individuals with and without restricted mobility. There are several possible explanations to account for this finding. First, previous research has shown that children and adolescents with restricted mobility are often excluded from being with peers in different settings (Missiuna & Pollock, 1991; Muldreij, 1997). Our results are consistent with this observation. It appears that children and adolescents with restricted mobility have more difficulty than their non-disabled age-mates in developing peer relationships. Our findings suggest that the reason young persons with restricted mobility have difficulty in building peer relationships is due to both physical and social barriers.

Another explanation to account for why physically disabled children and adolescents have fewer peers than non-disabled children and adolescents may be related to the surroundings where the latter individuals spend time. Especially during the adolescent years, young people tend to congregate in many different surroundings. Our results indicate that complex activities during the adolescent years are spent in a variety of settings, including sport arenas, movie theatres, discotheques and related places. In these surroundings accessibility is often severely restricted for persons with physical disabilities. In these locations we found that adolescents with restricted mobility had few contacts with members of the same age group. These data correspond with earlier research (Butler, 1984; Campos & Barenthal, 1987) and is in accordance with Oliver's (1996) social model of disability, which asserts that it is society that is the cause of physically impaired people's disability. If these locations were made adaptable for young people with restricted mobility, it is quite plausible that these people would develop a larger number of peer relationships in their social network.

Our overall results suggest there is interdependence between the number of peer relationships, the activities that individuals undertake and the settings in which these activities are carried out. These reciprocal relationships have not been examined within either the ecological model of Bronfenbrenner (1979) or the social model of disability of Oliver (1996). Bronfenbrenner purports that human development is facilitated through interaction with peers and participation in divergent physical and social environments. However, Bronfenbrenner says little about the specific problems that arise for persons with restricted mobility. Oliver's model, on the other
hand, focuses on physical disability and environmental problems. Yet, his model does not pertain to an individual’s interactions in these environments, but is more concentrated upon society’s central role. Future research should explore in greater detail the inter-dependence between peer relationships, activities that individuals enter upon and the particular settings in which these activities are conducted. It would also be worthwhile to determine if steps taken to resolve environmental problems for persons with restricted mobility lead to an increase in their activities and the number of peer relationships. As it were now, one can ask what consequences a lack of peer relationships has on children and adolescents with restricted mobility. One can speculate that because children and adolescents with physical disabilities are often isolated and rejected (i.e. few quality peer relationships), these young people will be deprived of crucial social models. Such models are important in realizing social adjustment and social competence. Some investigations suggest that this is a realistic appraisal of the situation (Robinson & Stalker, 1998; Hartup, 2000).

When it comes to the social network’s different sectors, the study revealed that children and adolescents with restricted mobility had most of their interrelationships with their family and relatives. Concerning the family, we found that it was the family members of children and adolescents with restricted mobility that gave both emotional and practical support: there was always someone in the family that showed concern for the child or adolescent’s well being. Such support was also noted in the relatives of the disabled persons. With respect to support from family and relatives, our findings indicated that there were no differences between children and adolescents with and without restricted mobility. Bronfenbrenner (1979) also pointed out the importance of family and relatives, noting that the family is crucial as regards practical, everyday support. The author further proposed that it is at least of equal importance to the children’s health and development to receive and give support to friends. However, our findings clearly demonstrate that disabled children and adolescents did not receive support from peers. Although we did not examine the affect that lack of support from the peer group has on physically disabled persons, we believe it is an important area for further research.

Another group of persons that disabled children and adolescents had a relationship to was professionals in health and education, including assistants, teachers, doctors, physiotherapists, occupation therapists and orthopaedic technicians. However, all these relationships involved adults and not peer groups. To have relationships with adults only may lead to the prevention of developmental progress of the children and adolescents’ autonomy (Sathananthan & David, 1997; Blomqvist et al., 1998). Gaining independence from parents is an
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extremely important process during the adolescent years. For disabled persons, who have primarily been in the company of adults during their childhood, disengagement from parents can be a challenging process (Missiuna & Pollock, 1991; Sathananthan & David, 1997). It is common for the parents of a youngster with a physical disability to overprotect their child (Johnson, 1995): such overprotection of children with physical disabilities can, in combination with an absence of peer contacts, cause serious social problems. Having mainly adults and only a few, if any, peers in the social network can significantly hamper the child’s possibilities to develop a sense of identity (cf. Mead, 1934; Eriksson, 1959). Bronfenbrenner (1979) also has drawn attention to how important it is that the microsystem includes a complex of relationships between the developing person and his or her social network.

Schools and neighbourhoods were the two sectors in which physically disabled participants had fewer relationships than physically non-disabled persons. Our findings demonstrated that the relationships that children and adolescents with restricted mobility have in school are chiefly with the assistants and teachers and not with classmates. The assistants in particular was the person that often gave both practical and emotion support in everyday situations. Concerning schoolwork, it was the teacher that provided feedback to the children and adolescents with physical disabilities. One interpretation of this situation is that although the disabled children and adolescents were integrated into the ordinary school system, the integration was only physical in character, without involving deeper incorporation into the social community of the school. Several researchers (e.g., Simeonsson et al., 2001; Baker & Donelly, 2001) have noted that the social integration process (defined here as promoting harmonious interaction and solidarity at all levels of society) in school today has focused solely on the physical surroundings, with social integration being largely neglected. According to Söder (1989) and Mattsson (1994), this trend to neglect, rather than enhance, social integration seems to be also true in Swedish schools. Without positive peer relationships even in school means that the disabled are shut off from schoolmates, a situation that must be construed as negative relative to personal development and high self-esteem. To improve the position for disabled children, schools need to work towards social integration by making appropriate arrangements so that peer contacts can develop and flourish naturally. In this respect, we believe that the social model of disability can be of relevance.

When we examine the relationships that the children and adolescents had with their peers more closely, we discover that not even these relationships were reciprocal. This observation is exemplified by the fact that when the children or
adolescents had invited their peers to their birthday party, there were few, if any, that showed up. According to Bronfenbrenner (1979), mutual relationships and the mastery of a sophisticated set of reciprocal exchange skills play a particularly important role in the individual's development. Such development is necessary in preparing the individual to build supportive network relationships later in life. If children and adolescents have limited opportunities to establish reciprocal relationships with peers, some important developmental experiences will be lost.

In summary, when the data are analysed, the most obvious finding is the large difference between the investigated and comparison group in the number of peers in the social network of the two groups. The physically disabled participants had fewer peers in their social network, a tendency that became more marked with the transition from childhood to adolescence. This inclination, in turn, contributed to a condition in which physically disabled young people had more limited opportunities for various activities outside their homes. A sparsely social network yields fewer opportunities to train social roles, behaviour and proficiencies, which can affect children and adolescents' development negatively (Bronfenbrenner, 1979). Looking at the life of these children and adolescents from the social ecology model of Bronfenbrenner (1979), the innermost circle (i.e. the microsystem) of the nuclear family seems to be particularly close, whereas the adjacent circle (i.e. the mesosystem of peers, neighbours and other acquaintances) may be less accessible. Beyond that, the exosystem of education (school system), leisure system (leisure activities) and organisations of different kinds are hardly suitable for physically disabled young people. How can one help develop the social network of physically disabled children and adolescents? Several researchers (e.g., Corohan & Bö, 1989; Belle, 1989; Robinson & Stalker, 1998) suggest that parents and other adults in close contact with these young people could function as bridge-builders to those activities that their peers engage in by, for example, helping them come into contact with other children, even if physical and social barriers exist. Parke and Bhavnagri (1989) argue that such parental facilitation of peer bonds, when carried out with the understanding of the child's developmental needs, can result not only in a richer social network for children but also in improvements in children's social skills. In accordance with the social model of disability, if public places and facilities (both social and physical) in which non-disabled young people spend time are made more accessible to young people with disabilities, it becomes possible to create activities and relationships on more equal terms.

**Strengths and limitations of the study**

The primary strength of this study is that the social network instrument (Aresik-Ram & Elf, 1997) provided rich information about the social
network of children and adolescents with restricted mobility. A further strength of the study is that it included young people covering a wide lifespan (7-19 years). Also, the study identifies themes that the children did not mention on their own accord (e.g., whether they had a best friend or someone they could confide in). Another positive aspect is that the study is based on a series of questions administered directly to the children about their relationships with different categories of network members. This approach has the advantage of examining the social network from the respondents' perspective, which we believe is particularly important in that it shows which components of the respondents' social network that are psychologically important to them. A final strength is that the study includes an adequate comparison group.

The limitations of the study have mainly to do with issues related to sampling. The number of participants in the investigated group was unfortunately small. Furthermore, it was drawn from a clinical population and thus consisted only of children who were enrolled in the Children’s Rehabilitation Clinic. Consequently, the sample is not necessarily representative of the entire population of interest (i.e. disabled young persons). Another limitation is that the social network instrument we used was developed in a clinical context and therefore lacks psychometric properties.

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