The study focused on social competence (SC) and perceived sense of loneliness of preschool children with hearing loss (HL) in group inclusion (GI, a small group of children with HL is integrated in a standard classroom) and individual inclusion (II, each child with HL is individually integrated into a standard classroom). The relations between these factors and the child’s speech intelligibility were performed. Sixty-four children aged 4–7 years participated: 22 from an II and 42 from a GI. SC, perceived sense of loneliness, and speech intelligibility were evaluated through the use of questionnaires completed by the preschool teachers. The results showed that the SC of children in II was higher than the SC of the children in GI, while interacting with normal hearing (NH) children. In GI, the children’s SC with other children with HL was higher compared with their SC with NH children. In both groups, there were relationships between speech intelligibility and SC with NH children. In addition, in the II setting, there were relationships between the speech intelligibility and the perceived sense of loneliness. These relationships were not found in the GI setting. The findings support the need for coenrollment of preschool children with HL and emphasize the crucial impact of speech intelligibility of children with HL on the success of their social enrollment with NH children, already at a young age.

**Social Competence and Sense of Loneliness**

Social competence (SC) refers to the social, emotional, and cognitive dimensions that the individual needs to adopt in order to create successful social interactions (Bierman & Welsh, 2009). SC includes the individual’s emotional awareness, sociability, tendency to be prosocial (Chen, 2000; Chen, Li, Li, & Li, & Liu, 2000; Rydell, Hagekull, & Bohlin, 1997), and the readiness and ability to initiate social relations (Landry, Smith, Miller-Loncar, & Swank, 1997).

The capability and desire for social relationships develop in early childhood (Hartup, 1983). Research on early childhood has underscored the impact of the first 5 years of a child’s life on his or her social emotional development (Cooper, Masi, & Vick, 2009). Research has shown, for example, that children who had better SC and peer relationships in preschool were more academically successful in kindergarten than less socially skilled children (Buhs, Ladd, & Herald, 2006). Positive peer interactions in preschool are associated with better school adjustment, successful emotion regulation, and maintenance of positive peer relationships in the future (McElwain & Volling, 2005). Social interactions in childhood form the basis for the acquisition of SC in adulthood (Bukowski, Hoza, & Boivin, 1993). In other words, the quantity and quality of SC in the future will be substantially affected by the social interactions with peers in early childhood (Odom, McConnell, & Brown, 2008). SC can be affected by particular social circumstances and the extent to which the child’s skills, individual interests, and abilities are in harmony with those of other children in his or her environment (Bierman & Welsh, 2009).

Limited social ability may often hamper social interactions and hence may cause a feeling of rejection and loneliness in the child. Children who were rejected at an early age often find it difficult to...
overcome and develop effective social skills independently as adults (Kostelnik, 2002). Indeed, studies have found that low SC is a predictor of social isolation and loneliness (Asher, Parkhurst, Hymel, & Williams, 1990; Parker & Asher, 1993). Children can experience loneliness when they feel dissatisfied with the quality and frequency of social relations (Asher et al., 1990). Children who feel lonely often experience poor peer relationships and, therefore, express more loneliness than peers with friends. They often feel excluded, a feeling that can be damaging to their self-esteem (Rubin & Mills, 1988). In addition, they may experience feelings of sadness, malaise, boredom, and alienation (Cassidy & Asher, 1992). Lonely children, by not having group of friends, may miss out on many opportunities to interact with their peers, to imitate, and to learn important lifelong skills such as social communication and problem solving.

Finally, early childhood experiences that contribute to loneliness may predict loneliness during adulthood. Given the importance placed on the benefits of peer interactions and friendships to children's development, this potential lack of interaction raises many concerns for teachers who work with young children (Hymel & Franke, 1985; Renshaw & Brown, 1993).

Social Competence and Sense of Loneliness of Children With Hearing Loss

Children with hearing loss (HL) may have difficulties while growing up in developing effective social strategies and SC (Preisler, Tvingstedt, & Ahlstrom, 2002). As a result of their HL, which affects their communication functioning through the use of spoken language, they may face increasing difficulties in forming positive relationships with hearing peers (Martin, Bat-Chava, Lalwani, & Waltzman, 2010). Bat-Chava and Deignan (2001) investigated school-age children through interviews with parents, who reported on their children’s communication skills and peer relationships, and indicated that friendly relationships between children with HL and children with normal hearing (NH) are qualitatively different than the relationship between children with NH and their hearing friends. They suggested that the gap, and sometimes, lack in spoken language, was responsible for the difficulties of the children with HL in interacting with NH friends. Wauters and Knoors (2007) found no differences between children with HL in Grade 1–5 in mainstream education and NH children in terms of popularity, social status, and mutual friendships. However, they reported that children with HL were more frequently involved in social networks without deeper relationships in comparison to their NH peers. Research has also shown that preschoolers with HL had fewer and shorter social interactions than those of children with NH (Brown, Bortoli, Remine, & Othman, 2008).

In fact, studies have reported that many children with HL tend to interact mainly with children with the same hearing status (e.g., Antia, Kreimeyer, & Eldredge, 1994; Levy-Shiff & Hoffman, 1985; Minnett, Clark, & Wilson, 1994). Antia and Kreimeyer (1992) reported that preschool deaf/hard-of-hearing children described more sincere and rewarding relationships with other deaf/hard-of-hearing children, in comparison to their relationships with hearing children.

Studies on the sense of loneliness of deaf/hard-of-hearing individuals revealed that their negative emotional experiences such as lack of social skills to join a group, denial, and ignoring were often based on realistic social difficulties such as low social status or peer rejection (Charlson, Strong, & Gold, 1992; Stinson & Antia, 1999; Stinson & Kluwin, 2003). Wauters and Knoors (2007) reported that children with HL often had fewer friends and felt rejected or neglected more often than their hearing peers, leading them to feel isolated and lonely. Children with HL had a lower rating of prosocial behavior. They were categorized as less collaborative, received high rankings of social withdrawal behavior, and were more often perceived as victims who needed help in comparison to their NH peers. Nunes, Pretzlik, and Olsson (2001) reported, as well, that school-age children with HL in an individual mainstream were more neglected by their NH friends and were more likely to be without friends in class. In recent studies on children, who used cochlear implants, the authors reported on similar level of loneliness of these children to that of their hearing peers (Leigh, Maxwell-McCaw, Christiansen, & Bat-Chava, 2009; Schorr, 2006). Whereas Schorr (2006) reported on children in middle and late childhood, Leigh et al. (2009) reported on high school children. Scorr (2006), however, further reported on great variability among the participants.
with cochlear implants. She found that early cochlear implant intervention was related to lower sense of loneliness.

Research studies have reported that the social experience of children with HL was less positive in individual inclusion (II) where one child was integrated in class with NH children, compared with children in group inclusion (GI) where a group of children with HL were integrated in a group of NH children (Antia, 1985; Dale, 1984; Moores, 1991). Although the academic achievements of children with HL integrated in II may be high (Wray, Flexer, & Vaccaro, 1997), their social skills and feelings may be lower compared with those of NH children and to those of children with HL in GI. It has been reported that school-age children with HL in II had few friends, had little interaction with NH peers, and often experienced social rejection in comparison to their NH peers. They felt isolated and lonely (Stinson & Antia, 1999; Stinson & Kluwin, 2003).

Thus, in the II setting in which the child has no other peers with HL, he or she may experience unsuccessful social integration. Lack of contact with other children with HL may arouse feelings of loneliness, and, furthermore, may not allow children with HL to create opportunities for social interactions and opportunities to develop their SC. In contrast, in an earlier study on self-report of deaf/hard-of-hearing children in elementary school aged 12–14 years regarding their sense of loneliness, in two educational settings, II, and GI, Most (2007) found that there was no difference between the children in these two settings in their sense of loneliness. The author suggested that the children had similar feelings but that possibly the sources of these feelings were different. It is possible that the more negative feelings of the children in the II stemmed from feelings of ostracization or social rejection by their hearing peers, whereas the more negative feelings among the children in GI may have resulted from a sense of isolation because they were not studying in the mainstream. Similar results were reported by Leigh et al. (2009). These researchers found similar level of loneliness of adolescents with cochlear implants who studied in mainstream settings and deaf adolescents without cochlear implants who were enrolled in special education settings with other deaf adolescents.

As mentioned above, one major variable that affects the child’s ability to be engaged in social interactions is his or her proficiency in spoken language. Children’s ability to communicate well affects the formation of close relationships with others (Stinson & Whitmore, 2000). Comprehensibility of the child’s speech may be an important factor affecting the child’s SC and the way in which he or she is perceived by their peers.

**Speech Intelligibility, Hearing Loss, and Social Competence**

As mentioned above, spoken language constitutes an obstacle in establishing social relations between children with HL and their hearing peers. A main factor in spoken language communication is speech intelligibility. Many deaf/hard-of-hearing individuals have voice and speech characteristics that affect their speech intelligibility. For example, they tend to omit or substitute consonants and to neutralize vowels, they may have monotonous speech, and their voices may be characterized by inappropriate resonance, pitch, or intensity (Eisenberg, 2007; Most & Frank, 1994; Peng, Tomblin, & Turner, 2008). SC and sense of loneliness may be influenced by speech intelligibility (e.g., Most, 2007).

Markides (1989) found that, although 27% of children with HL reported having a hearing friend, only 3% of hearing children reported having a deaf/hard-of-hearing friend. This finding may raise speculation that children with HL may not experience mutual friendship. Hearing children explained that they did not have deaf/hard-of-hearing friends because they could not understand what children with HL were saying. Markides also found that 51% of children with HL described their good friend as a child with a similar hearing status. It appears that children with HL who are included in the general educational system must exhibit a high level of speech intelligibility in order to establish friendships (Markides, 1989; Stinson & Antia, 1999). Students with HL who were more skillful in their spoken language were found to experience better social integration with hearing students, compared with students less skilled at speech perception and production (Bat-Chava & Deignan, 2001; Stinson, Whitmore, & Kluwin, 1996). Thus, in the case of children with HL, communication ability and especially the ability to use spoken language for communication
constitute a central factor affecting social relationships, particularly with hearing individuals.

Most, Weisel, and Tur-Kaspa (1999) showed a linear relationship between speech intelligibility in children with HL and attitudes toward these children among nonexperienced school-age listeners. That is, attitudes toward children with poorer speech intelligibility were significantly less positive than those toward children with good speech intelligibility. As speech intelligibility increased, peers’ attitudes regarding these childrens’ cognitive abilities and personality features improved. In addition, the attitudes of NH children, who were exposed to children with HL because they studied in the same school setting, were more positive than those of NH children, who had not been exposed to children with HL. In a later study, Most (2007) investigated the relations between the speech intelligibility and the sense of loneliness among school-age children with HL in two educational settings: II and GI. The findings showed that the children with HL were lonelier than the children with NH. There was no difference between the two groups of children with HL with regard to their sense of loneliness. Examination of the relations between speech intelligibility and sense of loneliness revealed significant relations between the two variables among the children in the II track, but no such relations were observed in the GI track. The authors explained that, in the GI track, the social interaction did not rely on the intelligibility of the spoken language because the children interacted using speech and signs simultaneously.

The present study was conducted in Israel and aimed to expand the investigation of the relationship among SC, loneliness, and speech intelligibility of preschool children with HL. The investigation was conducted in two educational settings, II and GI, in order to determine how speech intelligibility was related to SC and sense of loneliness in each educational track. This kind of research into the social and emotional aspects of inclusion may contribute to placement considerations when selecting the program for a child that will enable optimal academic and social benefits.

In Israel, young children with HL enter kindergarten at age 3. The kindergartens settings are under the administrative supervision of the Ministry of Education and receive support and professional supervision from the MICHA Society for Deaf Children, a national early intervention agency that provides educational and rehabilitation services to young children with HL, age birth to 7 years, and their families. For the kindergarten partners (from age 3), two different educational settings are available: II and GI.

The II track integrates children with HL into regular kindergarten classrooms in their neighborhoods. These children, numbering approximately 60% of Israeli kindergartners with HL, receive hearing, speech, and language therapy at two locations—in the kindergarten classroom and also at the closest MICHA center. In addition, they receive social and emotional support through meetings at the MICHA center with peers who have HL. Children in the II track usually communicate solely through spoken language.

The GI track (the remaining 40% of Israeli kindergartners with HL) integrates a group of six to eight children who have HL into a standard kindergarten classroom with 25 children who have typical hearing. The two groups spend most of the day sharing common activities together, with the exception of two daily lessons (1 hr each), when the small group meets separately with a special education teacher for children with HL. During these lessons, the children with HL receive additional educational support on the topics covered in the kindergarten curriculum, such as, prior exposure to the vocabulary that is going to be presented during circle time. These children also receive hearing, speech, and language therapy in the kindergartens from MICHA professionals. The children in the GI setting communicate through either spoken language and/or simultaneous communication (speech and signs). It should be noted that degree of HL is not a factor in determining in which track a child is placed.

One of the goals of integration of children with HL in educational settings with NH children is to encourage positive social contact between NH children and children with HL. In this framework, a group of children with HL operates jointly with a group of NH children, so children with HL have more opportunities to form friendships with NH children, while also having the choice to play with their peers with HL (Ingber & Beni-Noked, 2006). This combination increases the chances of the child’s meeting hearing peers in his or her natural environment,
with them, acquiring SC, and learning strategies for creating social relations with classmates.

In sum, the present study focused on the SC and sense of loneliness of young children with HL and on the children’s speech intelligibility. The relationships among SC, sense of loneliness, and speech intelligibility were examined in two different kindergarten settings: II and GI. The SC of the children in GI was assessed by their teachers in relation to other peers with HL in their class and in relation to children with NH in their class. The SC of the children in II was assessed in relation to the children with NH in their class. We expected that the children in II would exhibit greater SC than the children in GI in relation to the NH children in their class. We expected that the SC of children with HL in GI would be better in relation to the other children with HL in their class than in relation to the NH children in their class. We expected that children in II would feel lonelier than children in GI because, in the former setting, they were the only child with HL in a class with hearing peers. We hypothesized that for the children with HL in II, there would be relationships between speech intelligibility and SC as well as speech intelligibility and sense of loneliness, considering that these children are more dependent on spoken language. We also expected to find relationships between SC toward the children with NH and speech intelligibility in the GI setting. We did not foresee, however, similar relations between speech intelligibility and loneliness in the GI setting because these children study with other peers with HL and do not depend solely on speech for their communication.

Methods

Participants

Participants comprised 64 kindergarten children (30 boys, 34 girls) aged 4–7 years (M = 5.5, SD = 0.69) with prelingual sensory neural HL. The children, all of whom were Caucasian, had varying degrees of HL from mild to profound (40–120 dBHL). All of them used sensory aids (hearing aids and/or cochlear implants). All the children were exposed to spoken Hebrew as the main mode of communication. All the children received speech and language therapy either once or twice a week. The children in the sample were enrolled either in an II track or a GI track (see details below). The placement criteria in each track included children’s language level, academic abilities, developmental level, and the child family’s ability to support and empower him/ her. None of the children had additional diagnosed problems.

The first group of children consisted of 22 children who were in the II track: each child was individually integrated into a standard kindergarten classroom in his or her neighborhood with children who had NH. All the children in this group used spoken language.

The second group of children consisted of 42 children who were in the GI track: small groups of children with HL, who were integrated into standard kindergarten classrooms. In this group, 32 children communicated through spoken language and 10 children used simultaneous communication (spoken language and signs).

All the children with HL were exposed to NH children in their classes. All the NH children were Caucasians as well. The NH children did not serve as participants in the study. The experimental groups consisted of the children with HL in the two educational settings, and they were assessed in relation to the NH children in their classes.

Instruments

Three questionnaires were used in the present research to assess the children SC, speech intelligibility, and sense of loneliness. All of them were completed by the children’s teachers due to the children’s young age. Since loneliness is a subjective feeling, and in the present study, loneliness was assessed by the teacher, we shall refer to it as the “perceived sense of loneliness.” In addition to the three questionnaires, a report on the children’s background was obtained.

1. The Hebrew adaptation of the Loneliness and Social Dissatisfaction Questionnaire (Asher, Hymel, & Renshaw, 1984; Margalit, 1991): The original questionnaire is self-reporting. In the present study, the items were rephrased so that the teacher could report on the child’s loneliness. The questionnaire consisted of 16 primary items tapping a child’s feelings of
loneliness (e.g., The child has nobody to talk to in the class, the child is lonely) and eight filler items (e.g., the child likes school) that covered various activity areas. The scale asked the teacher to rate how frequently the child experienced what was described in each item, on a 5-point scale ranging from *never* (1) to *always* (5). Asher et al. (1990) recommended the computation of a single total score tapping a global sense of loneliness. The range of scores was 16–80, where higher scores reflected more frequent feelings of loneliness. Internal consistency (Cronbach’s alpha) of the questionnaire was .86.

2. The Social Competence Inventory (SCI; Rydell, Hagekull & Bohlin, 1997): This scale was developed in order to assess the SC of children with their classmates by their teachers and/or parents. It was previously used on kindergarten children (Thorell, Bohlin, & Rydell, 2004) and also on children with HL (Andersson, Olsson, Rydell, & Larsen, 2000). There are two scales, prosocial orientation and social initiative, which were validated against observations in a Swedish sample. The prosocial scale comprises 17 items capturing the child’s ability to engage in positive peer interactions (e.g., “is good at preventing conflicts”). This scale’s α was .93. The social initiative scale comprises eight items capturing the child’s ability to initiate and take part in social interactions (e.g., “suggests activities to peers”). This scale’s α was .90. All the items are on a 5-point scale: 1 (*doesn’t apply at all*) to 5 (*applies very well*). The scale was translated into Hebrew for the purpose of the present research. Two independent bilingual translators (Hebrew and English speakers) translated the scale from English to Hebrew. Next, the Hebrew translation was translated back to English by two other bilingual translators (Vallerand, 1989). The translations were compared with the original English scale, and in case of disagreement about the wording of the translation and the original, the researchers discussed and agreed upon the best translation. In the present research, the mean score of the whole scale was calculated.

3. Speech Intelligibility Scale (Most, Weisel, & Cinamon, 2008): This 6-point scale includes five questions regarding the level of speech intelligibility when talking to familiar and unfamiliar people on familiar and unfamiliar topics. In this scale, 1 represents *very poor intelligibility* and 6 represents *very good intelligibility*. The score is calculated by dividing the sum of the scale by the number of items. Thus, each participant’s score ranged from 1 (*very poor speech intelligibility*) to 6 (*very good speech intelligibility*). The scale had α of .96.

4. Background Information Questionnaire: The background information questionnaire contained demographic details, including the participant’s age, gender, type and degree of HL, use of sensory aids, mode of communication, and speech and language therapy.

Procedure

The children were recruited via the Tel Aviv branch of MICHA, which is an organization for the education and rehabilitation of preschool children with HL and their families. The preschool children and their families receive the different MICHA services (such as speech and language therapy) during school hours or sometimes after school at the MICHA center. The special education teachers in the GI belong to the professional staff of MICHA and are under the training and supervision of MICHA. The regular kindergarten teachers, in both GI and II, get supervision from MICHA’s staff. With parental consent, the questionnaires were distributed to the children’s teachers through the MICHA office. The regular teachers in each educational setting were asked to complete the SCI, loneliness, and speech intelligibility questionnaires. For the GI children, the special education teacher completed the questionnaires as well. Each of the teachers completed the SCI twice: once assessing the child with HL in relation to the children with NH in the class and once in relation to the children with HL in the class. The background questionnaire was completed by a professional that was close to the child based on the information that exists in the child’s file at school. The special education teacher completed the background questionnaire for
the GI children, and the speech therapist completed it for the II children.

For the children in the II track, 22 regular teachers participated. For the children in the GI track, eight regular teachers and nine special education teachers participated. All the teachers were women in the age range of 30–50 years. All had college education and at least 5 years of experience.

Results

Each child received SC, perceived sense of loneliness, and speech intelligibility scores.

Social Competence

The children in II received the SC scores from their teacher in relation to the children in their class. All the other children in their class had NH. The children in GI received SC scores from each of their kindergarten teachers: the regular teacher and the special education teacher. The SC scores were given in relation to the children with NH in their class and in relation to the other children with HL in their class. Table 1 presents the \( M \) and SDs of the SC scores of the children in the two kindergarten settings. The table presents the \( t \) values that were obtained in the comparisons between the two groups.

As can be seen in the table, the children in II received significantly higher SC scores in comparison to those of the children in GI, when they related to the children with NH in their class. There was no significant difference, however, in the SC scores of the children in II in relation to the NH children and in the SC scores of the children in GI, when they were assessed in relation to the children with HL. In the GI group, the SC scores that were given by the two teachers did not differ significantly.

Additional analysis was conducted within the GI group. Their SC scores with regard to the children with NH, in comparison to their scores with regard to the children with HL in their class, were compared. The \( t \) test analysis revealed significant difference between the two SC scores. SC with regard to other children with HL was higher than those with regard to children with NH in their class. This finding was obtained based on the regular teacher evaluation as well as on the special education teacher evaluation, \( t(34) = -4.99, p < .001; t(41) = -7.58, p < .001 \), respectively.

Perceived Sense of Loneliness

The mean perceived loneliness scores, that were calculated based on the loneliness questionnaire for the children in II and GI, were not significantly different (\( p > .05 \)). The mean score of the children in II was 1.91 (SD = 0.81) and that of the children in GI was 1.88 (SD = 0.86, according to the special education teacher) and 2.18 (SD = 0.72, according to the regular teacher).

Social Competence and Perceived Loneliness

Examination of the relations between SC and perceived loneliness was conducted separately in each educational setting using Pearson product–moment correlation tests. Table 2 presents the obtained \( r \) values. For the GI group, the table presents the obtained values based on each teacher’s evaluation, including the SC scores obtained in relation to hearing children.
as well as other children with HL in their class. As can be seen in the table, significant negative correlations emerged between the SC and perceived loneliness of both the II and GI children. For the GI group, this was found both in relation to children with NH and children with HL in their class. Thus, children who were rated as having better SC were rated as less lonely in both educational settings, based on the evaluations of each of the teachers (regular and special education).

Speech Intelligibility

The mean speech intelligibility scores of the children in the two educational settings were calculated. The mean speech intelligibility of the II children was 3.91 (SD = 0.89). The mean speech intelligibility of the GI children was 3.31 (SD = 0.96, regular teacher) and 3.66 (1.08, special education teacher). t test analyses were used to examine the difference between the speech intelligibility scores of the children in the two educational settings. A significant difference emerged in the speech intelligibility of the two groups, t(55) = 2.38, p < .05, based on the regular teacher evaluations. Children in GI received a lower average speech intelligibility score than did children in II. There was no significant difference, however, in the speech intelligibility scores of the children in the two educational settings, based on the special education teacher evaluations.

Examination of the relations between speech intelligibility and SC and perceived loneliness were conducted separately in each educational setting, using Pearson product–moment correlation tests. Table 3 presents the obtained r values between SC, perceived sense of loneliness, and speech intelligibility. For GI, the table presents the obtained values based on each teacher’s evaluation, with the social scores obtained in relation to hearing children, as well as in relation to other children with HL in their class. As can be seen in the table, significant correlations emerged between the speech intelligibility of the II children and their SC, as well as between speech intelligibility and perceived sense of loneliness. Thus, individually integrated children with HL, who were rated as having better speech intelligibility, were rated as less lonely and as having better SC. In addition, significant correlations were found between the speech intelligibility of the children in GI and their SC with regards to the hearing children in their class, based on the evaluations of each of the teachers. No significant relations emerged between speech intelligibility of the GI children and their SC with regards to the other children with HL in their class or between their speech intelligibility and their perceived sense of loneliness.

Table 2  Relations between sense of loneliness and SC in relation to NH children as well as other children with HL in the different educational settings

<table>
<thead>
<tr>
<th></th>
<th>II, N = 22</th>
<th>GI (special education teacher), N = 42</th>
<th>GI (regular teacher), N = 35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relations between sense of loneliness and SC with NH</td>
<td>—</td>
<td>−0.52***</td>
<td>−0.62***</td>
</tr>
<tr>
<td>Relations between sense of loneliness and SC with HL</td>
<td>—</td>
<td>−0.65***</td>
<td>0.71***</td>
</tr>
</tbody>
</table>

Note. SC, social competence, II, individual inclusion, GI, group inclusion, NH, normal hearing, and HL, hearing loss.

### Table 3  Relations between speech intelligibility and socioemotional measures in the different educational settings

<table>
<thead>
<tr>
<th></th>
<th>II, N = 22</th>
<th>GI (special education teacher), N = 42</th>
<th>GI (regular teacher), N = 35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relations between speech intelligibility and SC with NH</td>
<td>0.42*</td>
<td>0.31*</td>
<td>0.34*</td>
</tr>
<tr>
<td>Relations between speech intelligibility and SC with children with HL</td>
<td>—</td>
<td>0.09</td>
<td>0.15</td>
</tr>
<tr>
<td>Relations between speech intelligibility and perceived sense of loneliness</td>
<td>−0.39*</td>
<td>−0.08</td>
<td>−0.19</td>
</tr>
</tbody>
</table>

Note. II, individual inclusion; GI, group inclusion; NH, normal hearing; and HL, hearing loss.

* p < .05.
Discussion

The present research examined the SC and perceived loneliness of young children with HL in relation to their speech intelligibility. These relations were examined in two educational settings: GI and II. The unique contribution of the present study is the examination of the relationship between the social aspects and speech intelligibility in different inclusion tracks, which already emerges at a young age.

Children’s Social Competence

The findings demonstrate that children with HL in II had significantly higher SC scores in comparison to the children in GI, in interacting with the children with NH in their class. There was no significant difference, however, between the SC scores of the children in II in relation to children with NH in their class and the SC scores of the children in GI with regard to the other children with HL in their class. These findings were obtained on the basis of reports from both teachers in the GI group (regular and special education teachers). These findings support previous results from older children, which showed that when the inclusion setting is more intensive with children with NH (as in II), children with HL demonstrated higher SC with NH children in their class and more social interactions with them (Kluwin, Stinson, & Colarossi, 2002; Musselman, Mootilal, & MacKay, 1996; Stinson & Whitmore, 1991; Stinson et al., 1996).

A possible explanation for the above findings may be that since the child with HL in II is the only one with HL in a group of children with NH, he or she is required to deal with social situations and tasks with them, throughout the day. Since they have no other children with HL in their class, they have no choice but to team up with NH children. In contrast, in GI, the small group of children with HL is separated from the group of children with NH for some parts of the day, during which they do not have an opportunity to interact with them. In addition, they always have the alternative to play and interact with other children with the same hearing status (Ingber & Noked, 2006).

As reported above, the findings of the present research demonstrated that the SC of the children in GI, with regard to their peers with HL, was significantly higher than their SC in relation to children with NH in their class. Previous studies on school-age children with HL also demonstrated that the children had higher social adjustment and more interactions with other children with HL, as compared with those with children with NH (Antia, 1982; Musselman et al., 1996; Nunes et al., 2001). Previous research on kindergarten children with HL also reported that the children had high motivation to play and interact with other children with HL, as opposed to limited motivation to interact with NH children. Thus, even when they have an opportunity to play with NH children, they prefer to spend time with other children with HL (Levy-Shiff & Hoffman, 1985; Minnett et al., 1994).

Weisel, Most, and Efron (2005) examined initiations of social interactions of preschool children with HL. The results demonstrated that the children experienced many more successful initiations of social interaction with other children with HL, in comparison to those with children with NH. Thus, it is possible that children with HL avoid interacting with NH children because they fear failure in the interaction. It is reasonable that since children with HL experience more successful interactions with other children with similar hearing status, this leads to their better SC.

It should be noted that the vast majority of the children in GI had severe to profound HL. Previous studies reported that this condition decreases the chances that the child will have NH friends (Roberts & Rickards, 1994). Bat-Chava, Martin, and Kosciw (2005) also reported on negative relations between the severity of the loss and the level of SC with NH friends. Thus, it is possible that the severity of the HL presents difficulties in the social interactions with children with NH, which leads to lower SC with them. Nevertheless, due to the small sample of the children, we could not examine the effect of the degree of HL directly. It is recommended to control this factor and to examine this issue in future research.

Professionals should be aware of the importance of good social experiences starting at a young age. These experiences will have an effect on the quantity and quality of the child’s social interactions in the future as well (Odom et al., 2008). The results suggest that educators in the GI setting should encourage the children with and without HL, to spend more time together.
during school hours in joint activities. They should also be more active in encouraging social interactions between children with HL and children with NH. They should construct opportunities and perhaps serve as mediators in such social interactions, as well as plan social intervention programs.

Perceived Sense of Loneliness

It was assumed that the children in the II setting would feel lonelier than the children in the GI setting since in the II setting the child is the only one with HL in a group of children with NH (Kluwin et al., 2002; Stinson & Antia, 1999; Stinson & Kluwin, 2003). However, the results of the current study show that the perceived sense of loneliness of the children in II and that of children in GI were not significantly different. This finding supports previous results that were reported in older children in elementary school (Most, 2007) and high school children (Leigh et al., 2009). As mentioned earlier, Most (2007) has suggested that the children in the two educational settings experienced similar feelings but that possibly the sources of these feelings were different. Obtaining qualitative data on the sources and contents of the children’s feelings in future research should add more to the understanding of the children’s sense of loneliness. In fact, other studies on children with HL in a GI setting that examined the social rejection of the children with HL by their NH classmates have suggested that the NH children preferred the company of NH peers and were less likely to interact and make friends with children with HL (Cappelli, Daniels, Durieux-Smith, McGrath, & Neuss, 1995; Nunes et al., 2001). Thus, it is possible that in the current study as well, the children with HL in the GI settings were perceived as feeling lonely because they were “different” than the majority of the children in their school, and even though they had other children with HL in their environment, their exclusion by the children with NH affected their feelings. It should be recalled, however, that due to the young age of the participants in the present study, the perceived sense of loneliness of the children was assessed. In other words, the assessment was conducted on the basis of the teacher’s impression and not on the basis of the children’s self-reports. Future research should further examine this issue and try to get information on the child’s subjective experience through direct reports.

Social Competence and Loneliness

Examination of the relations between SC and perceived sense of loneliness revealed significant negative correlation between the SC and perceived loneliness of both the II children and the GI children. Children who were rated as having better SC were rated as less lonely in both educational settings, based on the evaluations of each of the teachers (regular and special education). These findings validate the current results. Low SC led to difficulties in creating positive social interactions and hence minimized relationships with peers that led to a greater sense of loneliness (Asher et al., 1990; Parker & Asher, 1993).

Speech Intelligibility

In addition to SC and sense of loneliness, the teachers (regular and special education) rated the child’s speech intelligibility. When the special teacher assessment of speech of the children in the GI track was compared with the speech of the children in the II track, the results indicated similar speech intelligibility scores for the two groups of children. However, the speech intelligibility of the II children was higher than that of the children in the GI track when the latter children were assessed by their regular teacher. Although there was no significant difference between the assessments of the two teachers of the GI children, it should be noted that, the special education teachers’ assessments were higher than those of the regular teachers. This might be due to their experience as listeners to speech characteristics of children with HL (Most, 2007; Most et al., 1999). In these studies, it was suggested that the experienced listeners’ advantage in understanding speech can be attributed to their greater familiarity with the typical speech characteristics of people with HL. In addition, experienced listeners can use redundant contextual information that helps them understand speech more easily (Boothroyd, 1985; McGarr, 1983; Monsen, 1983; Most, Weisel, & Lev-Matezky, 1997).

The unique contribution of the present study is the examination of the relations between speech
intelligibility and SC and perceived loneliness already emerging at a very young age. The results reveal that children with HL in II, who were rated as having better speech intelligibility, were rated as less lonely and as having better SC. In addition, significant correlations were found between the speech intelligibility of the children in GI and their SC with NH children in their class, based on the evaluations of each of the teachers. No significant relations emerged between speech intelligibility of the GI children and their SC with other children with HL in their class or between their speech intelligibility and their perceived sense of loneliness. It should be noted, however, that the obtained significant correlations were mild. The coefficient values ranged from .312 to .426. The present research findings support and supplement what has been reported in previous studies on elementary school children in different educational settings: II and GI. Thus, in the previous research, as well, school children with HL who had high speech intelligibility were found to experience better social integration with NH students, compared with students with lower speech intelligibility (Bat-Chava & Deignan, 2001; Most, 2007; Stinson et al., 1996).

It is reasonable to assert that the children in the II were more dependent on their spoken language for social interaction since they were exposed only to children with NH. Thus, both their SC and perceived sense of loneliness were more dependent on their speech intelligibility. In contrast, the children in GI were not dependent on their speech intelligibility probably because they had other means of communication (speech and signs) with the other children with HL.

**Implications, Limitations, and Directions for Future Study**

The research on SC and loneliness of kindergarten children with HL is of utmost importance. Children with HL may experience difficulties in developing effective social strategies and SC from preschool (Preisler et al., 2002), and therefore it is important to detect children with HL that have social relationship difficulties as early as possible. This is because SC and social development are associated with later social acceptability and better social skills in school. Also, there is evidence to link SC and acceptance by peers to academic achievement, school adjustment, and well-being in adulthood (Dong Hwa, & Juhu, 2003). The current results raise questions regarding the negative social experiences that children may encounter and the effectiveness of including one child with HL in a regular class with only NH children. The smoother and more comfortable interactions with same-status peers have been shown to allow children to experience successful social interactions that may foster positive social development (Bat-Chava & Deignan, 2001).

The results of the present study imply that difficulties in establishing and maintaining peer interactions, caused in part by poor speech intelligibility, may preclude the child’s effective social behaviors with others and indeed lead to feelings such as loneliness. In fact, as noted above, according to our previous results (Weisel et al., 2005), preschool children with HL encountered more success in their interactions with other children with the same hearing status than with NH children.

The current study emphasizes that speech intelligibility is already important at a very young age. Good speech intelligibility is important not only for basic communication but also as a factor that might affect the child’s social feelings, especially within the II educational setting where all the other children have NH. In selecting a school setting, educators, speech and language therapists, and parents should look beyond academic factors and should not ignore the significant effect of speech intelligibility on the child’s well-being in school and on the child’s normal social and emotional development. Educational programs that integrate children with HL with their hearing peers should take into account these social difficulties that already occur at a young age, and professionals should consider incorporating early interventions in the area of social interaction (Antia et al., 1994; Messinheimer-Young & Kretschmer, 1994). Also, it is recommended that future research will further investigate issues that are related to the development of SC in young children with HL, including personality, theory of mind, and specific social skills among others.

The current study has several limitations. Although studies have shown that reports of adults, including educators, about children’s feelings, are usually reliable
and reflect reality (Most, 2010), there may be some bias in the perception of the teachers regarding the children’s competence and feelings of loneliness. It is recommended that future research use the children’s self-reports as well. In addition, future research should use other research tools of assessment, such as, observation of social interactions or interviews with the children.

Last, due to the small sample and the heterogeneity of the groups with regards to the demographic characteristics, such as, degree of HL, type of sensory aid, etc., we could not control these factors in the analyses. It is possible that some of these factors mediated some of the findings. Future research should be conducted with larger samples allowing to conduct additional analyses such as multiple regression in order to expand the knowledge regarding the examined issues.

Conflicts of Interest

No conflicts of interest were reported.

References


