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Do You See What I See? School Perspectives of Deaf Children, Hearing Children, and Their Parents

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Abstract

Perspectives on academic and social aspects of children's school experiences were obtained from deaf and hearing children and their (deaf or hearing) parents. Possible differences between (1) the views of children and their parents and (2) those of hearing children and their parents compared to deaf children and their parents were of particular interest. Overall, parents gave their children higher school friendship ratings than the children gave themselves, and hearing children and their parents were more positive about children's friendships than were deaf children and their parents. Both children and parents also saw deaf children as less successful in reading than hearing children. However, deaf children's having deaf parents, attending a school for the deaf, and using sign language at home all were associated with more positive perceptions of social success. Use of cochlear implants was not associated with perceptions of greater academic or social success. These and related findings are discussed in the context of parent and child perspectives on social and academic functioning and particular challenges confronted by deaf children in regular school settings.

Introduction

This paper explores the perspectives of deaf children and their hearing parents on school-related issues, both academic and social. Since the 1970s, many countries have seen a diaspora into public schools of deaf children who previously attended schools for the deaf. In the United States, for example, since passage of the Education for All Handicapped Children Act of 1975, there has been a shift from approximately 80% of deaf children attending schools for the deaf to the point where now over 85% spend all or part of the school day in regular school classrooms (Data Accountability Center, 2008). Although there is still considerable debate concerning which deaf children will benefit from *mainstreaming* and to what extent (Stinson & Kluwin, 2011), there is no doubt that the influx of students with special needs has changed the face of public education (e.g., Fish, 2002).

The challenge of understanding the social and academic needs of deaf children in regular classrooms is of interest both practically and theoretically. It is now well documented that despite many cognitive similarities between deaf and hearing children (Naglieri, Welch, & Braden, 1994), there are also cognitive differences likely to affect their learning inside and outside of the classroom (Marschark & Hauser, 2008, 2012). Social functioning of deaf

children in regular classrooms also has been the subject of extensive study (see Stinson & Antia, 1999; Calderon & Greenberg, 2011), but interactions of social, cognitive, and academic functioning in this population are largely unexplored. Nevertheless, given the observed relations among school performance, mental health, and peer relations among hearing children (e.g., Doll, 1993; Lubbers, Van Der Werf, Snijders, Creemers, & Kuyper, 2006), it is likely that some of the academic difficulties demonstrated by deaf children have social as well as cognitive and linguistic origins. Indeed, these domains all influence each other (Chen, Rubin, & Li, 1997; Welsh, Parke, Widaman, & O'Neil, 2001).

With the cumulative, interactive nature of schooling, the perspectives of students, teachers, and parents all are important for understanding changing social and academic dynamics. Deaf children's communication barriers, however, can make for particular difficulties at the level of peer interactions as well as child-adult interactions, and perceptions of those interactions may be more variable than when they only include hearing individuals. For example, hearing children who are rejected or poorly accepted by their peers – a common situation of deaf children in regular classrooms – are at risk for both aggressive behavior (Doll, Murphy, & Song, 2003) and social isolation (Doll, 1993; Rubin, Hymel, LeMare, & Rowden, 1989). When children lag in language development (and perhaps cognitive development) their perspectives may not be effectively communicated, understood, or appreciated.

Beyond general interest in the agreement (or lack thereof) between child and adult perceptions of deaf children's experiences in school, parent and child perspectives are particularly important for two reasons. First, because of the children's hearing losses and most parents' lack of familiarity or fluency with sign language, many deaf children with hearing parents will have less than optimal parent-child communication (Meadow-Orlans, Mertens, & Sass-Lehrer, 2003), and neither children nor parents may have sufficient information to fully understand each other's views on a variety of topics. Parents therefore may be relatively unaware of their deaf children's experiences in school, leading to a lack of correspondence between child and parent perspectives and a host of difficulties in day-to-day family functioning.

A second reason why an examination of parent and deaf child perspectives is informative relates to deaf children's social functioning in school settings. Studies conducted since the mainstreaming diaspora have revealed that deaf children in regular school classrooms often feel lonely and left out of interactions involving their hearing classmates (e.g., Capelli, Daniels, Durieux-Smith, McGrath, & Neuss, 1995; Mertens, 1989; Stinson & Antia, 1999; Stinson, Whitmire, & Kluwin, 1996). To some extent, such feelings of exclusion are justified, as studies have indicated that hearing children tend to have negative views of deaf peers and frequently resist including them in group activities (Knutson, Boyd, Reid, Mayne, & Fetrow, 1997; Stinson & Liu, 1999; cf. Wauters & Knoors, 2008). Although many people expected that situation to be different for children who have better hearing and speech through the use of cochlear implants, evidence of change has been limited (see Punch & Hyde, 2011; Spencer, Marschark, & Spencer, 2011; Wheeler, Archbold, Gregory, & Skipp, 2007).

Studies of parent perceptions of social functioning among deaf children with cochlear implants generally indicate that parents view their children as well-adjusted and satisfied in their interactions with hearing peers (e.g., Nicholas & Geers, 2003; Warner-Czyz, Loy, Roland, Tong & Tobey, 2009). Beadle, Shores, and Wood (2000) found parents to report that their deaf children were happier and had a higher quality of life following cochlear implantation. Adolescents in a study by Wheeler et al. (2007) reported that communication with family and friends improved with their cochlear implants but there were no

comparisons with children without implants or pre-implant assessments. Bat-Chava and Deignan (2001), however, found that better social interactions with hearing peers were limited to those children whose hearing was most improved by their implants. Even in the "more successful" cases, implants rarely provide children with sufficient speech and hearing to level the social playing field (Jambor & Elliott, 2005; Knutson et al., 1997).

Such findings suggest that parents of deaf children, at least those with children in mainstream classrooms, might believe that their children are happier in school than the children actually are. Relevant data on this issue are not yet available, but previous studies generally do not support the claim. Some studies show overall satisfaction of parents with their children's social activities after cochlear implantation, and even improvement (e.g., Christiansen & Leigh, 2002); others indicate that children with implants still encounter obstacles in the hearing environments (e.g., Watson, Hardie, Archbold, & Wheeler, 2008). This does not necessarily mean that hearing parents underestimate their children's difficulties or abilities; they simply have a different point of reference and perhaps reach different conclusions.

With regard to academic functioning in school, we know that deaf students tend to overestimate their academic abilities. Empirical data along these lines have been obtained with regard to deaf children's reading comprehension (Ewoldt, 1986; Strassman, 1997) and more recently in deaf college students' learning via both reading, sign language, and spoken language (e.g., Marschark, Sapere, Convertino, Seewagen, & Maltzen, 2004). Subsequent studies have documented deaf students' significantly greater tendency to overestimate test performance relative to hearing peers following both classroom lectures and reading (e.g., Borgna, Convertino, Marschark, Morrison, & Rizzolo, 2011). Deaf students in mainstream classrooms thus may believe that they are doing better academically than their parents and teachers think they are (see Alexander & Murphy, 1999).

Child Perspectives, Parent Perspectives

As described above, problems in communication between children and adults can take on new meaning when the children are deaf and the parents or teachers are hearing. Given the language issues involved and emerging findings indicating cognitive differences between deaf and hearing students in executive functioning, metacognition, and knowledge organization (e.g., Hauser, Lukomski, & Hillman, 2008; Marschark & Knoors, in press), miscommunication or poor communication between deaf children and their parents would not be surprising. The extent to which such literal and metaphorical communication problems affect a child's functioning in school remains unclear, but there is some evidence available regarding differences in child and parent perspectives in the social-emotional domain.

A variety of studies has examined the agreement of parent perceptions of their hearing children's behaviors and emotions with that of the children's self reports finding overall parent-child concordance to be rather low (e.g., Achenbach, McConaughy, & Howell, 1987; Kristensen, 2001). Parents tend to report their children having significantly higher frequencies of externalizing type behaviors (e.g., inattention, hyperactivity), whereas children report greater frequency of internalizing type behaviors (e.g., anxiety, depression; Achenbach et al., 1987; Kramer et al., 2004). Even in reports concerning close friends and participation in leisure activities, agreement between parents and their hearing adolescents is relatively low (Kramer et al., 2004).

In comparison to studies involving hearing children, there is limited research examining the perceptions of parents and deaf children with regard to social-emotional functioning. In a survey of 111 Swedish deaf and hard-of-hearing children, Mejstad, Heiling, and Svedin

(2008, 2009) found that teachers' ratings of students' social competence were significantly lower than those offered by the students and their parents (McFayden-Ketchum & Dodge, 1998); the latter two did not differ from each other. Vogel-Walcutt, Schatschneider, and Bowers (2011) conducted a profile analysis of teachers' ratings, parents' ratings, children's self-reports, children interviews, and researcher observations. Responses from 20 deaf and 20 hearing children aged 8–11 years were organized into six different constructs: externalizing behaviors, internalizing behaviors, social skills, loneliness, school interest/assertiveness, and task orientation. Deaf children and hearing children did not differ significantly on the first four constructs but did on the school interest/assertiveness and task orientation constructs. Deaf children also reported more difficulty in making friends.

Given the diverse if limited findings above, the present study examined perceptions of deaf children and their hearing parents with regard to social-emotional and academic functioning in school. It was expected that because of the communication barriers involved, there would be greater agreement across domains in the perceptions of hearing children and their hearing parents and deaf children with their deaf parents than deaf children and their hearing parents. Deaf children also were expected to be less positive than their hearing peers with regard to social functioning in school but to have comparable or even higher assessments of their performance (even if erroneously). Overall, variability was also expected to be greater among children's responses than parent's responses due to factors related to hearing status and age as well as natural variance among children.

Method

Participants

The child sample consisted of 54 children identified by their schools as deaf (with parent confirmation) and 54 hearing children, aged 5 to 12 years from both the United States and United Kingdom (see Table 1 for age and gender details). Hearing thresholds for 47 of the deaf children were provided using the common classification of mild loss (25–40 dB), moderate loss (41–70 dB), severe loss (71–90 dB), and profound loss (91 dB and greater). The numbers of children in each category are provided in Table 1. Consistent with recruitment requirements, all of the deaf children were reported to be of normal intelligence and to have no other disabilities. Fifteen of the deaf children had cochlear implants, having been implanted at a mean age of 33.75 months ($SD = 7.4$). According to parent reports, in the U.S. sample, three of the children were Latino, one was Asian, one was a Native American, two were Black, 37 were white, and 10 were of mixed race. In the UK sample, parents reported that 52 of the children were white and two were of mixed race.

Preliminary analyses indicated that there were no significant differences in age as a function of hearing status, gender, or country (all F s [1, 100] < 1.0). Eighteen of the deaf children had at least one deaf parent. For convenience, the samples henceforth are referred to "deaf" and "hearing" on the basis of child hearing status, regardless of parental hearing status. The 12 children with implants in the U.S. sample using cochlear implants represented 28% of that group, considerably larger than the 15% of U.S. school-aged children reported to use implants according to the annual survey of the Gallaudet Research Institute (2011). That survey generally is seen to underestimate the number of deaf and hard-of-hearing children in the U.S., however, particularly with regard to singletons in mainstream classrooms (who are more likely to have cochlear implants).

Materials

Questionnaires tapping children's and parents' perceptions of academic functioning and academically-related social functioning included 24 items. Because the children were

involved in a larger study concerning cognitive foundations of mathematics performance, mathematics was overrepresented in the questionnaire, but as can be seen in the Appendix, it covered a variety of areas. Questions were based on items in the Academic Self-Description Questionnaire I (ASDQ-I; Marsh, 1990) and the Self-Description Questionnaires I-III (SDQ; Marsh, 1992; Marsh & Shavelson, 1985). The original forms of these instruments were not used because they included too many items given the time demands of the primary study, lacked items tapping some of the issues we wished to investigate, and had others superfluous to our needs. In addition, although the questions could be read verbatim to younger hearing students, sign language versions, both in American Sign Language (ASL) and British Sign Language (BSL), were needed for use with some of the younger deaf children. The questionnaire therefore was treated as a new instrument and exploratory factor analyses and reliability analyses on the questionnaire are described below.

Parent and child versions of the questionnaire were similar, with 17 of the questions having identical wording except for references to the child (e.g., "I" versus "My child"). All questions required responses on a 5-point scale representing true, mostly true, sometimes true/sometimes false, mostly false, and false. In order to avoid response bias, approximately half of the items were worded negatively (e.g., "My child performs poorly in reading"). Positive items were reverse coded so that higher scores are "better" (e.g., "I hate math" is false). While questions are discussed in their original form below, higher ratings always refer to more positive attitudes.

Procedure

The child questionnaire was completed at a convenient time during one of the three or four testing sessions comprising the primary study of cognitive and mathematics functioning. Parents/guardians of the children received the parental version of the questionnaire by mail, completed it at their convenience, and returned it to the investigators. Families in the United States were paid for their participation. Due to ethics regulations in the United Kingdom, no incentives were provided to those families, although children received a laminated certificate acknowledging participation in the study after completion.

Results and Discussion

Questionnaire data initially were examined using factor analysis. Direct oblimin rotation was used to allow for non-orthogonal factors. The expectation that parents' data would be more coherent than children's data was borne out. While no obvious item clustering was revealed in the analysis of the children's data, four item clusters were apparent in the factors emerging from the parent data ($KMO = .768$, Bartlett $p < .001$): Reading (three items), School (four items), Math (three items), and Social-emotional (five items). Subsequent Cronbach alpha reliability analyses indicated reliability for the scales ranging from acceptable to excellent (alphas from .70 to .91, see Table 2). Three other items in the parent questionnaire loaded on those factors but did not have direct counterparts on the child questionnaire and six additional items did not fall into any obvious cluster; these items were not included in the scales. The reliabilities of the corresponding four child scales (i.e., with matched questions) were less robust, with alphas ranging from .38 to .81, but as reflected by the factor analysis, no more robust scales emerged through several attempts at identification.

Child and parent scale scores were obtained by averaging the items within each. Unless noted otherwise, all and only those results described below were significant at or beyond the .05 level. Occasional missing data (0.62% of responses in the child and parent data sets) were dealt with through substitution of the mean for that item.

Preliminary analyses for group comparisons on the four scales examined possible differences between the U.S. and UK samples using 2 (country: U.S. versus UK) by 2 (hearing status: deaf versus hearing) by 2 (group: child versus parent perspective) analyses of variance (ANOVAs) in which the last factor was within-subjects, because ratings on matched questions referred to the same child. None of those analyses revealed any main effects or interactions involving country, and therefore that factor is not considered further below. Overall, girls saw themselves significantly more capable than boys with regard to reading (4.64 vs. 4.16), $F(1, 100) = 9.44$, $MSE = 7.06$, and in the social-emotional domain (4.11 vs. 3.76), $F(1, 100) = 9.32$, $MSE = 10.96$. Gender did not interact with hearing status, however, and data also were collapsed over that variable.

Comparisons addressing concordance of child and parent perspectives first involved using mean scores on the four scales as dependent variables in 2 (hearing status: deaf versus hearing) by 2 (group: child versus parent) ANOVAs in which the second factor was within-subjects. An analysis involving the Reading scale yielded only a significant main effect of hearing status, $F(1, 106) = 5.58$, $MSE = .82$, as hearing children were seen as more capable in reading than deaf children overall (see Table 3). This result is consistent with objective findings from achievement testing and classroom performance (e.g., Luckner & Handley, 2008; Qi & Mitchell, 2012). Similar analyses using the School and Math scales as dependent variables yielded no significant main effects or interactions. Analysis of the Social-Emotional scale yielded both a main effect of group, $F(1, 106) = 23.50$, $MSE = .52$, as parents saw their children as more socially successful than the children saw themselves, and a main effect of hearing status, $F(1, 106) = 9.39$, $MSE = .49$, as hearing children were seen as more socially successful than deaf children. The lack of any interactions with hearing status reflected a lack of support for the expectation that reports of hearing children and their parents would have greater concordance than those of deaf children and their (hearing) parents.

In summary, parents appear to overestimate the social success of their children, regardless of whether those children are deaf or hearing. At the same time, both parents and children rated the deaf children as being less successful in reading and social domains, a result consistent with objective data from previous studies. Hearing parents and their children were not found to be more similar in their perception of children's school functioning, raising questions about language and communication in the home that are addressed below.

Effects of Cochlear Implants

Increasing interest in the impact of cochlear implants on deaf children's schooling and socialization (e.g., Jambor & Elliott, 2005; Marschark, Rhoten, & Fabich, 2007) as well as their perspectives on changes created by cochlear implantation (e.g., Christiansen & Leigh, 2002; Watson et al., 2008; Wheeler et al., 2007) led us to conduct three analyses focusing on the 15 deaf children with cochlear implants. First, correlational analyses examined relations between children's scores on the four questionnaire scales, the age at which they received their implants, and how long they had been using them. Three significant correlation coefficients indicated that children who received their implants later had more positive views of their math abilities, $r(13) = .53$, and longer implant use was negatively associated with the children's views of their math abilities, $r(13) = -.52$, and their overall scholastic abilities, $r(13) = -.60$. Although the locus of this finding is unclear, it may reflect later hearing losses or better language development in children who received implants and thus had greater (early) access to spoken language in formal and informal instruction. Alternatively, these children might have been implanted later because their language development was less problematic, although the fact that at least 48% of the deaf children had profound hearing losses makes this unlikely.

The second analysis focusing on the children with cochlear implants compared their mean scale scores with those of an age-matched sample of deaf children without cochlear implants. Although our primary interest was on the two items related to communication and the three related to peer social interactions (see Appendix), none of the comparisons was significant, all $t_s(28) < 1.92$. Previous studies have reported both deaf children and their parents generally to be satisfied with their cochlear implants even if there are remaining barriers (e.g., Watson et al., 2008; Wheeler et al., 2007). This appears to be the first study, however, that compared the perceptions of deaf children with and without cochlear implants with regard to academic and social functioning in school. Although the children with cochlear implants had used them for an average of 5.87 years ($S.D. = 2.40$, range 1.83 to 9 years), any changes that might have occurred in their hearing or speech apparently did not result in any changes in their perceptions of social and academic functioning. Whether or not actual changes had occurred in those domains and how they might influence children's self-perceptions over time remain to be determined in future studies.

The concordance of child and parent perceptions as a function of whether or not deaf children had cochlear implants was examined using 3 (hearing status: deaf with cochlear implant, deaf without cochlear implant, hearing) by 2 (group: child versus parent) ANOVAs in which the second factor was within-subjects and the four scales of interest alternately served as dependent variables (see Table 3). Analysis of the Reading scale yielded a main effect of hearing status, $F(2, 90) = 4.71$, $MSE = .86$, as for both parents and children, hearing children were rated as more competent than deaf children without cochlear implants who, in turn, were rated as more competent than deaf children with cochlear implants; only the difference between the hearing children and the deaf children with cochlear implants was significant according to post hoc Bonferroni tests (see Table 3). Although we do not know whether this difference was based on an actual performance difference, it may reflect the frequently-observed overestimate of reading comprehension by the deaf students (e.g., Borgna et al., 2011). Alternatively, it may be that the children with cochlear implants are actually more accurate in assessing their (relatively poor) reading abilities. The only other significant result emerged from the analysis of the Social-Emotional scale, which yielded both a main effect of group, $F(2, 90) = 20.44$, $MSE = .51$, as parents of all children rated them as more socially successful than the children did themselves, and a main effect of hearing status, $F(2, 90) = 5.87$, $MSE = .48$, as hearing children were seen to be more socially successful than deaf children with or without cochlear implants, who had almost identical scores (Table 3). Thus while parents frequently report their deaf children to be more socially competent after receiving a cochlear implant (e.g., Christiansen & Leigh, 2002; Watson et al., 2008), comparisons among children lead to different conclusions.

The present results are consistent with findings of Knutson et al. (1997), Bat-Chava and Deignan (2001), and Jambor and Elliott (2005) who found that cochlear implants did not guarantee greater social success. The finding that deaf children with cochlear implants were seen as less successful than children without cochlear implants in the reading domain, however, contrasts with studies indicating cochlear implants to be associated with better reading abilities, at least among younger children.

Effects of Language and Setting among Deaf Children

A variety of studies has examined the academic performance of deaf children with deaf versus hearing parents, but there do not appear to have been any investigations of the perceptions of those individuals of deaf children's academic and social functioning in school. Concordance of parent and child perspectives in families with (at least one) deaf versus hearing parents was examined using 2 (parental hearing status: deaf or hearing) by 2 (group: child versus parent) ANOVAs in which the second factor was within-subjects, and the four scales of interest alternately served as dependent variables. None of the analyses

yielded any significant effects when the Reading, School, or Math scores were dependent variables. The Social-Emotional scale, in contrast, yielded main effects of both parental hearing status, $F(1, 52) = 6.94$, $MSE = .53$, and group, $F(1, 52) = 9.67$, $MSE = .56$. Deaf children of deaf parents were seen as more socially successful than deaf children of hearing parents by both children and parents, while both deaf and hearing parents saw their deaf children as more socially successful than did the children themselves. The difference between child and parent perspectives was somewhat smaller when children had deaf parents, but the interaction was not significant (see Table 3).

Related to whether deaf children have deaf or hearing parents is the effectiveness of the communication at home. Studies described earlier would lead to the expectation that better communication at home would result in more similar child and parent perspectives on school functioning. Although information on the actual effectiveness of parent-child communication was not available, possible effects of the mode of communication were examined using 3 (mode of child-parent home language: sign language, English, or both) by 2 (group: child versus parent) ANOVAs in which the second factor was within-subjects and the four mean scales scores alternately were used as dependent variables. As in the analyses relating to parental hearing status, there were no significant effects in the analyses relating to home language to Reading, School, or Math scores. Analyses involving Social Emotional scores, however, yielded significant main effects of both language, $F(1, 50) = 4.26$, $MSE = .53$, and group, $F(1, 50) = 11.56$, $MSE = .58$. As can be seen in Table 3, beyond the higher ratings of perceived social success by parents than children, both groups saw social success as (significantly) greater in families using sign language at home compared to families using either English or both sign language and English at home, which did not differ (see Table 3).

A final set of analyses examined possible associations of child and parent ratings and whether children were enrolled in schools for the deaf or regular (mainstream) schools. Several studies have found that deaf children in regular classrooms report feeling lonely and socially isolated in mainstream classrooms (e.g., Capelli et al., 1995; Stinson & Antia, 1999; Stinson et al., 1996), but have not considered either perceptions of their functioning in academic domains or compared their feelings with those of deaf peers in schools for the deaf. Differences in mean scores as a function of school placement were examined using 2 (school: school for the deaf versus mainstream) by 2 (group: child versus parent) ANOVAs in which the second factor was within-subjects and the four means scales scores alternately were used as dependent variables. Once again, there were no significant differences involving Reading, School, or Math scales, but parents' ratings of social success was higher than children's, regardless of school placement, $F(1, 49) = 19.40$, $MSE = .47$. Children enrolled in schools for the deaf also were seen by both their parents and themselves as more socially successful than those in mainstream schools, $F(1, 49) = 8.22$, $MSE = .54$.

Taken together, the above analyses suggest that having deaf parents, using sign language at home, and attending a program designed for deaf students improves social functioning, at least in the eyes of deaf children and their parents. These results may reflect the benefits of improved communication between deaf children and their parents. Still to be determined is whether those perceptions are borne out by actual evaluations of social interactions and networks (e.g., via sociometric studies).

Conclusions

The present study demonstrated that deaf 5- to 11-year-olds are well aware of the fact that they lag behind hearing peers in reading and social-emotional domains, at least as indicated by self-ratings on related dimensions. Both their parents and the parents of hearing children see their children as more socially successful than the children see themselves, but contrary

to the expectation that communication barriers between deaf children and their parents would result in lesser concordance in their perspectives, differences were no greater for families with deaf children than those of hearing children. Similarly, little difference was found in perspectives on academic and social functioning in school between deaf children with and without cochlear implants. Hearing children were seen to be more socially successful than either group, a view shared by both parents and children. Such findings caution against accepting parents' judgments about the social success of their children without taking into consideration the views of the children themselves in the context of appropriate comparison groups.

Other results appeared consistent with previous findings indicating that cochlear implants do not ensure greater social success for deaf children in the classroom and that deaf students may overestimate their abilities to comprehend text (as well as signed and spoken language). Perceptions of social success among deaf children, in contrast, are significantly affected by whether they have deaf or hearing parents, whether parent-child communication involves sign language, and children's school placements. Future studies need to re-visit these issues in the context of measures of actual school performance and friendship patterns.

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Appendix

Child Questionnaire

Scale		Statement
1	M	Math is easy for me

Scale		Statement
2	S	My parents are generally happy and proud of what I do
3		Praise from my parents for my good work in math is important
4	R	I like reading
5	SE	My parents don't always understand what I tell them
6	SE	Most other kids have more friends than I do
7		In math, the harder the problem the harder I try
8	SE	I have a hard time making friends
9	SE	Most other kids like me
10	R	Reading is hard for me
11	S	I hate school
12	SE	I feel like I can talk to my parents about most things
13	S	All school work is easy for me
14	R	I am terrible at reading
15	S	I am terrible in all school subjects
16	M	I hate math
17	M	I am good at math
18		My math teacher is usually unhappy or disappointed with my work
19		A lot of things about me are good
20		My math teacher is easy to understand
21		My math teacher understands what I tell them
22		I feel like I can't do anything right
23		I can do things as well as most other people
24		Praise from my teachers when I do good work in math is important

Scales: R=Reading, S=School, M=Math, SE=Social-emotional

Parent Questionnaire

Scale		Statement
1	M	My child finds math very hard
2	S	I am pleased with how our child is doing in school
3		I think it's important to praise my child when he/she does well in math
4	R	My child hates reading
5	SE	My child and I communicate very well
6	SE	My child doesn't have as many friends as other children do
7		If my child worked harder in math he/she would do better
8	SE	My child makes friends easily
9	SE	Most other kids like my child
10	R	My child reads well
11		My child hates all school
12	SE	My child prefers not to talk to me about things

Scale		Statement
13	S	All school subjects are easy for my child
14	R	My child performs poorly in reading
15	S	My child performs well on all school subjects
16	M	My child hates math
17	M	My child is good at math
18	S	My child's teacher is usually happy and satisfied with my child's work
19		I believe that natural talent is more important than hard work, when it comes to doing well in math
20		My child learns things quickly in math
21		It is important to me that my child does well in math
22		I don't seek advice from the teacher about how well my child is doing in math
23		My child's teacher is unaware of his/ her individual needs
24		I let my child work things out in math by himself/herself

Scales: R=Reading, S=School, M=Math, SE=Social-emotional

Table 1

Mean (standard deviation) ages by hearing status and gender and categories of deaf children's hearing loss (in the better ear).

Deaf		Hearing	
Male	Female	Male	Female
n=28	n=26	n=22	n=32
9.03 (1.57)	8.76 (1.89)	8.86 (1.94)	9.06 (1.59)
Deaf Children's Hearing Losses		severe n=7	
		moderate n=8	
		mild n=6	
		profound n=26	

Table 2

Cronbach Alpha coefficients for questionnaire scales *

	Deaf		Hearing	
	Child	Parent	Child	Parent
Reading	.52	.81	.54	.84
School	.61	.73	.38	.85
Math	.81	.70	.61	.91
Social-Emotional	.44	.72	.43	.70

* See Appendix for items in each scale.

Table 3

Means scores (and standard deviations) on four scales

	Reading		School		Math		Social-Emotional	
	Child	Parent	Child	Parent	Child	Parent	Child	Parent
Hearing (N=54)	4.51 (.71)	4.52 (.75)	4.12 (.54)	4.01 (.70)	3.99 (.90)	4.08 (.89)	3.88 (.77)	4.31 (.54)
Deaf(N=54)	4.17 (.93)	4.28 (.83)	3.95 (.81)	3.90 (.57)	4.01 (1.12)	3.92 (.75)	3.54 (. 81)	4.06 (.70)
Deaf Subgroups								
Cochlear Implant Use *								
CIs(N=15)	4.00 (.89)	3.93 (.97)	4.09 (.68)	3.75 (.57)	3.98(1.10)	3.82 (.85)	3.45 (.83)	3.96 (.83)
No CIs (N=24)	4.18(1.02)	4.28 (.87)	3.71 (.87)	3.88 (.60)	4.04(1.11)	3.99 (.90)	3.45 (.72)	4.12 (.71)
Parental Hearing Status								
Deaf Parents (N= 18)	4.09 (.89)	4.35 (.83)	4.27 (.71)	3.97 (.66)	4.14 (.98)	3.72 (.79)	3.88 (.77)	4.24 (.55)
Hearing Parents (N=36)	4.21 (.95)	4.24 (.85)	3.80 (.81)	3.86 (.52)	3.95 (1.20)	4.02 (.72)	3.38 (.78)	3.96 (.76)
Language at Home *								
Sign Language (N=16)	4.10 (.88)	4.35 (.82)	4.12 (.94)	3.95 (.63)	3.84(1.25)	3.62 (.58)	3.89 (.70)	4.34 (.56)
English (N=22)	4.20 (.98)	4.29 (.78)	3.70 (.65)	3.74 (.56)	4.02(1.12)	3.97 (.84)	3.45 (.81)	3.93 (.71)
Sign and English (N=15)	4.16 (.96)	4.18 (.99)	4.14 (.84)	4.08 (.50)	4.13 (1.05)	4.22 (.69)	3.32 (.87)	3.93 (.79)
School Type								
School for the Deaf (N=34)	4.22 (.84)	4.34 (.75)	4.07 (.87)	3.96 (.59)	4.00(1.14)	3.87 (.71)	3.72 (.77)	4.16 (.74)
Mainstream School (N=17)	4.02(1.14)	4.20(1.04)	3.69 (.73)	3.79 (.55)	4.12 (.90)	4.04 (.87)	3.08 (.58)	3.92 (.60)

* Deaf subgroups totalling <54 indicate non-responses by parents on relevant questions