Empirical Articles

Academic Status and Progress of Deaf and Hard-of-Hearing Students in General Education Classrooms

Shirin D. Antia
Patricia B. Jones
Susanne Reed
Kathryn H. Kreimeyer
University of Arizona

The study participants were 197 deaf or hard-of-hearing students with mild to profound hearing loss who attended general education classes for 2 or more hours per day. We obtained scores on standardized achievement tests of math, reading, and language/writing, and standardized teacher's ratings of academic competence annually, for 5 years, together with other demographic and communication data. Results on standardized achievement tests indicated that, over the 5-year period, 63%–79% of students scored in the average or above-average range in math, 48%–68% in reading, and 55%–76% in language/writing. The standardized test scores for the group were, on average, half an *SD* below hearing norms. Average student progress in each subject area was consistent with or better than that made by the norm group of hearing students, and 79%–81% of students made one or more year's progress annually. Teachers rated 69%–81% of students as average or above average in academic competence over the 5 years. The teacher's ratings also indicated that 89% of students made average or above-average progress. Students' expressive and receptive communication, classroom participation, communication mode, and parental participation in school were significantly, but moderately, related to academic outcomes.

This study reports on the academic status and progress, over a 5-year period, of deaf and hard-of-hearing (DHH) students attending general education classrooms in public schools. Although there is comparatively little information on this subgroup of students, 44% of DHH students nationally spend more than 16 hrs a week in classrooms with hearing students (Gallaudet Research Institute, 2006). In the United States, there has been a steady increase in the numbers of DHH students attending general education classrooms in the past decades, due to legislation and the growing movement toward inclusion (Stinson & Antia, 1999). With the widespread use of early identification and intervention (National Center for Hearing Assessment and Management, 2008), many children with hearing loss are likely to develop language and communication skills within the range of their hearing peers (Yoshinaga-Itano, Sedey, Coulter, & Mehl, 1998). These students will probably be placed in general education rather than self-contained classrooms. Thus, it is possible that the percentage of DHH students attending general education classrooms will continue to grow in the future.

Both deaf and hard-of-hearing students can encounter communication difficulties in the general education classroom (Antia, 2007). Whereas the communication difficulties of students who are deaf and use interpreters may be obvious to teachers, the communication difficulties faced by hard-of-hearing students (i.e., those with pure tone averages [PTAs] less than 70 dB in the better ear) are often invisible. Because many hard-of-hearing students use spoken English as their preferred mode of communication, they are often perceived as having more in common with hearing than with deaf students. Their communication and educational needs may be overlooked

The authors wish to acknowledge the support provided by the teachers who graciously supplied the data, the parents who permitted us to learn about their children over a long period of time, and our consultants Michael Stinson and Frank Gresham. No conflicts of interest were reported. Corresponding should be sent to Shirin D. Antia, College of Education, University of Arizona, Box 210069, Tucson, AZ 85741-0069 (e-mail: santia@u.arizona.edu).

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doi:10.1093/deafed/enp009
Advance Access publication on June 8, 2009

because of the belief that they can function easily in oral environments and have less need for support services than students who are deaf (Marschark, Lang, & Albertini, 2002; Ross, Brackett, & Maxon, 1982). However, poor classroom listening conditions can create considerable difficulty for hard-of-hearing students thereby limiting their access to academic content. Because hard-of-hearing students constitute 46% of students reported to the Annual Survey of Deaf and Hard of Hearing Children and Youth (Gallaudet Research Institute, 2006) and 78% of DHH students in general education classrooms (Karchmer & Mitchell, 2003), it is informative to the field to obtain current data on the academic status and progress of both hard-of-hearing and deaf students, as was the focus of this study.

The academic status of DHH students is traditionally measured through the use of standardized test scores (Allen, 1986; Traxler, 2000). Standardized tests are a valuable tool to compare the academic achievement of DHH students to national norms for typically hearing students. However, academic status can also be measured through teachers' perceptions of students' academic functioning (Most, 2006; Power & Hyde, 2003). We chose to look at both standardized test results and teachers' perceptions to provide a multidimensional picture of the academic status of the DHH students in this study. In the following sections, we (a) describe a framework for measuring academic status, (b) review the academic status of DHH students, and (c) review the factors contributing to DHH students' academic status.

Measuring Academic Status

Academic status can be examined through several frames of reference: normative academic status, classroom academic status, and academic progress (Semmel & Frick, 1985). Normative academic status refers to students' standing compared with national or state norms and can be obtained through scores on national or state standardized academic achievement tests. Classroom academic status refers to students' achievement in comparison with classmates. Classroom status can be measured by obtaining teachers' perceptions of students' achievement and ability to learn expected academic content. Academic progress refers to the change in academic achievement from one year to the next and can be measured both by looking at gains on achievement tests and teachers' perception of student change (Semmel & Frick, 1985).

Each of these frames of reference is important. Students may do poorly on national or state standardized tests, yet be achieving as well (or as poorly) as their classmates. Conversely, students may be achieving at grade level according to standardized test scores, yet be falling behind their classmates academically. Students who begin their school careers achieving below their hearing classmates may make desirable progress from year to year, but yet not make sufficient progress to "catch up" with their classmates. A complete picture of academic status should, therefore, include all three frames of reference.

Normative Academic Status of DHH Students

Research on the academic achievement of DHH students indicates that they lag far behind what is expected of their hearing peers at similar ages or grade levels (Allen, 1986). By high school, about 50% of a national sample of DHH students were performing at a below-basic proficiency level in reading comprehension and math problem solving (Traxler, 2000). However, DHH students who receive their instruction in general education classrooms are reported to have higher academic achievement than those who receive instruction in self-contained classrooms (Holt, 1994; Kluwin, 1993; Kluwin & Stinson, 1993). Holt (1994) in a report of 58,000 DHH students who took the Stanford Achievement Test during 1989–1990 found that those in local schools, attending general education classrooms for more than 16 hrs a week, scored higher than students who were in self-contained classrooms. This was true even after the influence of demographic variables such as age, gender, degree of hearing loss, and ethnicity had been statistically controlled. Kluwin (1993) and Kluwin and Stinson (1993) found that adolescents who attended general education classrooms had higher reading comprehension scores than those who received their instruction primarily in self-contained classrooms.

It is, of course, not clear whether the higher achievement is an antecedent or a consequence of attendance in general education classrooms. An early study (Kluwin & Moores, 1985) found that, after matching or controlling for factors such as parental

employment, prior achievement, gender, ethnicity, and degree of hearing loss, deaf students who received math instruction in general education classes had higher scores in math computation than students who received math instruction from teachers of DHH in self-contained classrooms. It is possible that DHH students in general education classrooms demonstrate higher academic achievement than those in self-contained classrooms due to academic press, that is, those aspects of the school environment that "press" students to perform academically, such as teacher's expectations, school policies, and academic standards (Lee & Smith, 1999). Alternatively, it is possible that DHH students who are high achievers are placed and remain in general education classes.

Although their achievement may be higher than that of DHH peers in self-contained settings, DHH students in general education classes appear to score below their age- or grade-matched hearing peers. An early study of DHH students in public schools (Davis, Shepard, Stelmachowicz, & Gorga, 1981) found that whereas those students with a PTA of less than 50 dB had scores commensurate with their hearing peers, those with a PTA greater than 50 dB scored in the low-average range for reading and math on standardized achievement tests. A study of elementary students with mild hearing loss (Blair, Peterson, & Viehweg, 1985) found that although these hard-of-hearing students achieved within the norms for their age group on a standardized achievement test, they scored below a control group of matched hearing classmates. Blair et al. (1985) obtained standardized achievement scores in the areas of arithmetic problem solving, math concepts, vocabulary, and reading comprehension on 24 matched pairs of first through fourth grade hard-of-hearing and hearing students. The hard-of-hearing students received scores consistent with their grade level; for example, at the end of second grade they received grade-level scores between 2.5 and 3.4 across subject areas. However, they consistently scored below their matched hearing peers.

Classroom Academic Status of DHH Students

Only a few studies (Most, 2006; Power & Hyde, 2002) of classroom academic status exist for DHH students in general education. Most (2006) compared teachers' perceptions of 33 Israeli-Arab DHH students and 66 hearing students in the same general education classrooms. All students were in Grades 1–6. She used a questionnaire that tapped the general education teachers' perception of student performance in five domains: academics, attention, communication, class participation, and school behavior. The teachers gave the DHH students significantly lower scores in all domains than the hearing students. In addition, significantly fewer DHH than hearing students received passing scores in each domain.

Power and Hyde (2002) asked 143 itinerant teachers supporting DHH students in general education classrooms in Australia to report on the ability of their students to participate in the general education curriculum. These teachers reported that 66% of their students were academically competitive with their hearing classmates (i.e., they met the same standards for teaching and assessment), 14% could work within the general education curriculum but were not competitive with hearing classmates, whereas 17% met only minimum academic standards and could not be evaluated by the same standards used with hearing classmates.

It is clear that there is little research that compares the academic status of DHH students to their hearing peers in the same classrooms. The differences in results reported by Most (2006) and Power and Hyde (2002) are likely to be due to differences in the methods of obtaining data but could also be due to differences in the availability of services, placement policies, or student characteristics. Clearly, few generalizations can be made from these studies, indicating a need for additional research to add to our knowledge of teachers' perceptions of the academic standing of DHH students when compared with hearing classmates.

Academic Progress of DHH Students

Academic progress of DHH students can be measured through either cross-sectional or longitudinal studies. In cross-sectional studies, different students are compared across grade levels, whereas in longitudinal studies the same students are followed over a period of time. Cross-sectional data on the Stanford Achievement Test (Harcourt Educational

Measurement, 1996) from national samples of DHH students showed that the median achievement score increased by grade level, although scores remained consistently lower than hearing norms (Karchmer & Mitchell, 2003). Karchmer and Mitchell (2003) also reported that high performing DHH students made annual gains similar to the norming sample of hearing students. Blair et al. (1985) in the previously described study used a cross-sectional design to compare progress of hard-of-hearing and hearing students and reported that the hard-of-hearing students made one grade's progress in 1 year's time.

In an early large-scale, but retrospective, longitudinal study, Wolk and Allen (1984) examined gains made in reading comprehension by DHH students using their scores on the Stanford Achievement Test between 1974 and 1979. They reported a scaled score growth of approximately 3.6 points annually, about one-third of a grade equivalent change per year. In a more recent prospective longitudinal study, Kluwin and Stinson (1993) tracked the achievement of DHH students in public high schools from 9th through 12th grade and reported that 9th grade achievement was a good predictor of 12th grade achievement. Thus, students who had comparatively high achievement early in high school continued to achieve at a higher level at later grades. However, the authors did not report the average academic gains of students from year to year.

The research on academic progress shows that some DHH students make annual achievement gains similar to hearing peers (i.e., one grade level each year), whereas others make much smaller annual gains. Detailed and current longitudinal academic growth data on DHH students are scarce. Although the large-scale national studies (Karchmer & Mitchell, 2003; Wolk & Allen, 1984) report data for all DHH students across educational settings, it is also important to examine the academic growth of particular subgroups of DHH students, including those being educated primarily in general education classrooms, in order to inform educational programs.

Variables Associated With Academic Status

Considerable research, both qualitative and quantitative, has been conducted on the variables that are associated with the academic status of DHH students. Demographic variables including degree of hearing loss, ethnic status, and the presence of additional disabilities have been studied extensively. Early studies found that greater degree of hearing loss was associated with lower academic achievement and growth (Allen, 1986; Davis et al., 1981; Wolk & Allen, 1984); however, some recent research indicates that degree of hearing loss is not strongly associated with overall academic success (Powers, 2003). In fact, students with mild hearing loss may have lower achievement than those with moderate or severe hearing loss (Most, 2004, 2006). Minority ethnic status, usually associated with a home language different from the majority language, consistently depresses academic achievement, as does the presence of a cognitive disability (Allen, 1986; Powers, 2003).

Communication factors are also associated with academic achievement. For DHH students in general education classrooms, participating in classroom communication and having good receptive and expressive communication skills are variables reported to promote academic success (Antia, Sabers, & Stinson, 2007; Stinson, Liu, Saur, & Long, 1996), as is the use of oral communication (Roberts & Rickards, 1994). Historical factors are also likely to affect communication and subsequently academic achievement. These factors include age of identification of hearing loss (Yoshinaga-Itano et al., 1998) or age of enrollment in early intervention (Moeller, 2000). Family variables influencing achievement include family involvement in their child's education, knowledge of the school program, ability to help with homework, expectations of the child and press for achievement, and adaptation to the child's deafness (Bodner-Johnson, 1986; Kluwin & Gonter Gaustad, 1992; Reed, Antia, & Kreimeyer, 2008). Finally, academic success may be influenced by multiple variables concurrently. Reed, Antia, and Kreimeyer (2008) reported that successful DHH students had many child, family, and school facilitators in place, whereas unsuccessful students had few facilitators and many detractors.

It is clear that many variables are related to student academic achievement. Disaggregating the influence of these variables is difficult because they are often related in complex ways. Also, the variables are likely

to be correlated to each other. For example, degree of hearing loss is likely to be related to receptive and expressive oral communication skills, which in turn may be related to classroom communication and participation. Family involvement is likely to be related to family resources and parental expectations for their child, which may also influence the child's communication skills and academic success. Nevertheless, it is informative to examine variables that are associated with academic achievement, especially those that can be influenced by school programs.

To summarize, we have known for a long time that, as a group, DHH students have achievement levels below those expected of same-grade hearing students. DHH students in general education classrooms have higher achievement on average than DHH students in self-contained classrooms but, in many instances, continue to achieve below hearing norms. Studies of teachers' perceptions of DHH students' academic status compared with peers in general education classrooms are few, thus little is known of how DHH students fare in these classrooms. Current data on academic progress, especially prospective longitudinal data, are scant.

The primary purpose of this study was to examine the normative academic status, classroom academic status, and the academic progress of DHH students in general education classrooms over a 5-year period. A secondary purpose was to examine current (as compared with historical or demographic) factors that are associated with students' academic status in order to provide practical implications for instructional practice.

Methods

Participants and Setting

DHH students were eligible to participate if they met the following requirements at the time of enrollment in the study: (a) had an identified bilateral or unilateral hearing loss, (b) did not have additional severe cognitive disabilities, (c) received direct or consultative services from teachers of DHH or had an individual education plan (IEP), (d) attended general education classrooms in public schools for two or more hours each day, and (e) were in Grades 2–8 at the beginning of the study. Once enrolled, students stayed in the study unless we were unable to locate them or obtain data on them in subsequent years. Thus, over the 5 years, some students reduced or increased their time in general education classrooms or moved to a center school. As expected, in subsequent years fewer students remained enrolled in the study.

Students were recruited from Arizona and Colorado through state agencies and school districts. Both of these states have well-established programs to support DHH students in public schools. In Arizona, regional programs administered by the state school for the deaf provide and coordinate interpreting, itinerant teacher, and assessment services for DHH students in their local schools. In Colorado, school districts provide services to DHH students while the Colorado State Department of Education monitors closely the outcomes of all DHH students in the state. The State Department uses these outcome data to provide assistance to teachers of DHH to improve services to their students as needed. Only students who received support services from a teacher of DHH at the time of enrollment were included in the study.

Requests to allow students to participate in the study were sent to parents of all eligible students from the consenting agency or district. We made special efforts to enroll students from ethnic minority groups. Permission for participation was obtained for 197 students. However, we were not able to obtain all demographic or academic data for each student. In some cases, the student moved from the school during following years, and in other cases the teacher of DHH did not obtain or send the researchers the required data.

Table 1 presents the gender, degree of hearing loss, grade, hours spent in general education classrooms, mode of communication, home language, and ethnicity of the students enrolled in the study. We have reported all available data on the 197 students, noting the numbers where data are missing. As can be seen, there are similar numbers of male and female students. Degree of hearing loss is quite evenly distributed, ranging from students with unilateral or high-frequency hearing loss to students with profound hearing loss. Most students spent three or more hours a day in general education classrooms. Students who

Table 1 Participant characteristics

	Total study participants	
	n	%
Total students with permission to participate	197	
Gender		
Male	104	53
Female	93	47
Degree of hearing loss		
Unilateral/high frequency	34	17
Mild (21–40 dB)	40	20
Moderate (41–60 dB)	31	16
Severe (61–90 dB)	46	23
Profound (90+ dB)	26	13
Missing information	20	10
Grade at beginning of study		
Grades 2–5	103	52
Grades 6–8	79	40
Missing information	15	8
Number of hours in general education classroom		
<1 hr/day	3	2
1 to <3 hrs/day	5	3
3–5 hrs/day	54	27
5+ hrs/day	115	58
Missing information	20	10
Primary mode of communication		
Spoken	139	71
Spoken and signed	32	16
Signed only	16	8
Missing information	10	5
Primary home language		
English	140	71
Spanish	25	13
Navajo	3	2
ASL	2	1
Signed English	4	2
Other	8	5
Missing information	15	8
Ethnicity		
White	118	60
Native American	12	6
Asian	3	2
African-American	8	5
Hispanic	46	23
Other	1	1
Missing information	9	5

Note. ASL, American Sign Language.

spent less than 2 hrs a day were retained in the study because they met the requirement that they attend general education classes for two or more hours a day at the beginning of the academic year when initial permission was received. Spoken communication was the primary mode for most students, although 24% used at least some sign communication. Twenty three percent of students had a home language that was not English, and 37% belonged to minority ethnic groups.

These students attended 125 different elementary or middle schools at the beginning of the study. Only 30 schools had more than one DHH student enrolled in the study. Thus, it is likely that most students were the only DHH students in the school.

Instruments

We obtained demographic data, teacher's ratings of students' communication, students' self-ratings of classroom participation, and preferred communication mode. Normative academic status was measured using standardized achievement tests normally administered as part of the state accountability system. Classroom academic status was measured through a teacher rating scale—the Academic Competence Scale of the Social Skills Rating System (SSRS; Gresham & Elliott, 1990). Academic progress was examined on both normative and classroom academic data.

Demographic data. A demographic data form requesting information on degree of hearing loss, amplification, parental participation in school, and services received was completed by each participating student's teacher of DHH. To obtain information on parental participation in school, we asked teachers to check off from the following list the activities in which parents or family members were involved: attending IEP meetings, taking sign language classes, communicating with school personnel, volunteering at the school, attending parent–teacher conferences, attending school events, and taking parent classes or workshops. From these data, we created a parental participation score by summing all the school activities in which parents or guardians were involved. We also obtained the list of academic and nonacademic general education classes attended by the student and the number of hours that the student spent in general education classrooms. Academic classes included language arts, math, science, and social studies, whereas

nonacademic classes included fine arts and physical education.

Teacher's ratings of communication. The teachers of DHH completed a rating of each student's expressive and receptive communication using the Functional Rating Scale developed for the Annual Survey of Deaf and Hard of Hearing Children and Youth (Karchmer & Allen, 1999). The scale consists of a three-point rating of audiological, communicative, cognitive, behavioral, and social areas. Descriptive anchors are provided for each area. The purpose of the scale was to obtain information about how students function within the school setting. Research on the psychometric properties of the rating scale showed that it had valid and interpretable components related to the demographic data obtained on the 1997–1998 Annual Survey of Deaf and Hard of Hearing Children and Youth (Gallaudet Research Institute, 1997–1998). For example, almost 95% of DHH students with mental retardation were judged to have a thinking or reasoning functional limitation.

For purposes of this study, only the expressive and receptive communication ratings were used. These communication ratings are made with reference to the environment in which the student is placed. The teacher rates the student's communication skill and fluency using the mode of communication customary for the student. A high rating on the three-point scale indicates that the student communicates with teachers and peers fluently and easily; the mid-level rating indicates that the student has some difficulty communicating in the classroom, but these difficulties can be overcome with explanation and repetition; the lowest rating indicates that the student is severely limited even when using accommodations such as interpreters or assistive technology. Students who communicated orally as well as those who signed could receive any of the three ratings.

Classroom communication participation. Classroom participation was measured using the Classroom Participation Questionnaire (CPQ) that was adapted from the Perceived Communication Ease Questionnaire developed for high school and college students (Garrison, Long, & Stinson, 1994; Stinson et al., 1996). We adapted the scale for younger students, allowing the questionnaire to be read to students as necessary. The questionnaire measures students' perceptions of success in receiving and sending information in the classroom and their feelings about participating in classroom communication. The CPQ consists of 28 statements that a student rates on a four-point scale (1, almost never; 2, seldom; 3, often; 4, almost always). The questionnaire yields four subscale scores: Understanding Teacher (eight statements), Understanding Students (five statements), Positive Affect (six statements), and Negative Affect (nine statements). When completing the CPQ, students were asked to reference either their general education classroom (for elementary students) or their language arts or social studies class (for middle and high school students). The CPQ is reliable and valid with this school-age population (Antia et al., 2007).

Preferred communication mode. Four items on the CPQ asked students to rate their preferred expressive and receptive mode of communication with hearing peers and general education teachers. For example, students were asked, "How do you like best to communicate with regular education classroom teachers?" In response, they selected one of the following options: interpreter, sign, speech, speech and sign, and writing notes. We assigned each response a score (1, use of interpreter; 2, sign or speech and sign; 3, speech). No students chose writing notes. These scores were then summed and averaged yielding a preferred communication mode score. A high score denotes a preference for speech.

Academic status. Normative academic status was obtained from standardized tests taken by students as part of each state's accountability requirements. The test results were obtained from student files. Students in Arizona took the Stanford Achievement Test—9th edition (Stanford-9; Harcourt Educational Measurement, 1996) during the first 3 years of the study. During Years 4 and 5, the Arizona Department of Education substituted the TerraNova, Second Edition (CTB McGraw Hill LLC, 2003) for students in Grades 2–9. Students in Colorado took the

Colorado Student Assessment Program (CSAP; Colorado Department of Education, 1999) during all 5 years of the study.

The Stanford-9 and the TerraNova are standardized, norm-referenced assessments; the CSAP is also a standardized assessment developed to measure Colorado's content standards. The Stanford-9 and the TerraNova are nationally normed tests; the CSAP has state norms. All three assessments have math, reading, and language/writing tests at each grade level. Students are required to take these tests each year from Grade 2 through Grade 9 in Arizona and Grade 10 in Colorado.

Although data were obtained from three different standardized achievement tests, the constructs measured by these tests are similar. The math section of each test assessed computation procedures and problem solving. The reading section of the tests required students to read and comprehend passages. The language/writing section required students to have knowledge of the process and conventions of writing.

Classroom academic status was measured by the Academic Competence Scale of the SSRS (Gresham & Elliott, 1990). The SSRS is a norm-referenced rating scale consisting of separate scales that yield scores in three domains: social skills, problem behaviors, and academic competence. There are separate versions for elementary and secondary students. Each scale yields a standard score with a mean of 100 and an *SD* of 15. The Academic Competence Scale includes nine items requiring teachers to rate students on a five-point scale, placing each student in the lowest 10%, the next lowest 20%, the middle 40%, the next highest 20%, or the highest 10% on reading and math compared with classmates and grade expectations. Teachers also rate the students on motivation, intellectual functioning, classroom behavior, and parental encouragement. Because the SSRS was not normed on DHH students, we calculated reliability and validity data on our sample of students in Year 4 of the study. Internal reliability coefficients (coefficient alpha) for this sample of DHH students were close, but slightly lower than levels reported for the norming population. The coefficient for the DHH sample was .93 for elementary students and .89 for secondary students. The reliability coefficients reported in the test manual for the norming sample were .95 for both elementary and secondary students. In order to get a measure of validity, we obtained correlations between the academic competence scores on the SSRS and the Stanford-9 reading, language, and math scores for the same year. Correlations were significant and ranged from .55 to .60.

Data Collection Procedures

After parental and school district or program permissions were obtained, the researchers sent each student's teacher of DHH a packet of instruments together with directions as to when the assessments should be administered and who should complete each assessment. The teacher of DHH completed the demographic form based on information available in the student's file, completed the Functional Rating Scale, and administered the CPQ to the student. The teacher of DHH distributed the SSRS to each student's general education teacher. Classroom teachers completed the SSRS for students in the elementary grades. For students in middle and high school, the SSRS was completed by a general education teacher from whom the student was currently taking a class and who was judged by the teacher of DHH to know the student well. The teacher of DHH collected the completed assessments and mailed the test protocols to the researchers. The research team entered the data into a database and contacted teachers regarding missing or erroneous information. These procedures were followed each year for 5 years.

Data on standardized achievement test scores were obtained from students' files or from the respective State Departments of Education. The standardized tests were administered once a year, usually in the late spring. Policies on make-up days varied by state; in some cases not all students in the study took the test. Once students reached Grade 10 (in Arizona) or Grade 11 (in Colorado), they were no longer required to take these tests. Thus, the numbers of students on whom test results are available vary each year. By the fifth year of the study, students who were in Grades 7 and 8 at the beginning of the study did not take the standardized achievement tests.

Results

Normative Academic Status and Progress

All three standardized achievement tests provided scaled scores at each grade level, for three content areas: math, reading, and language/writing. All scores were converted to normal curve equivalents (NCEs). These are standard scores with a mean of 50 and an *SD* of 21.06. NCEs are similar to percentile ranks but provide an equal-interval scale, allowing computation of means and *SD*s. We first examined the results of each test (Stanford, TerraNova, and CSAP) separately to determine that they did not yield highly discrepant results before combining them. The data are presented three ways: first we present the mean NCE scores for each year for each content area; we then present the percentage of students who scored in the average, below-average, and above-average ranges for each area. Finally, we present the average progress made over the 5-year period.

Table 2 presents the means and *SD*s for each content area for each year. If DHH students had performed in a manner identical to that of the hearing sample on whom the instruments were normed, their mean NCE score would be 50. As can be seen, the average score each year is below 50. The mean NCE scores are highest in math and somewhat lower in the areas of reading and language/writing.

Because means can mask the range and distribution of scores, we also calculated the percentage of students who were in the below-average, average, and above-average range each year for each content area. Student NCE scores were categorized into one of three groups: those students whose performance was below average (NCE of 29 or lower), average (NCE between 30 and 70), or above average (NCE of 71 and above). These cut points represent values above or below 1 *SD* of NCE scores (21.06). Figures 1–3 show the percentage of students who scored in each category for math, reading, and language/writing. In each content area, over 50% of the students scored within the average or above-average range. In math, over two-thirds of the students scored within this range. In each content area, the percentage of students scoring above average is lower than the 16% expected in a normal distribution, whereas the percentage of students scoring below average is higher than would be expected.

In order to estimate average student progress, individual regressions were conducted on the scores across the 5-year period, yielding a slope and an intercept for each student's achievement scores in each of the three content areas. The slope of each

Table 2 Summary scores for math, reading, language/writing achievement, and academic competence by year

	Year 1	Year 2	Year 3	Year 4	Year 5	Overall
Math achievement[a]						
Mean	42.8	40.3	42.0	41.3	44.9	42.0
SD	19.5	20.5	21.5	20.6	18.5	20.2
n	120	135	119	101	77	552
Reading achievement[a]						
Mean	36.3	34.1	33.8	37.9	37.9	35.7
SD	22.1	21.7	20.8	21.4	20.9	21.5
n	146	153	126	101	78	604
Language/writing achievement[a]						
Mean	37.5	34.5	34.3	39.0	42.0	36.9
SD	21.2	21.5	22.8	18.6	19.4	21.0
n	142	152	125	103	78	600
Academic competence[b]						
Mean	93.0	91.9	94.0	94.6	93.7	94.0
SD	12.2	12.0	11.4	12.1	10.2	11.6
n	163	154	150	143	120	730

[a]Normal curve equivalent scores: mean = 50, *SD* = 21.
[b]Standard scores: mean = 100, *SD* = 15.

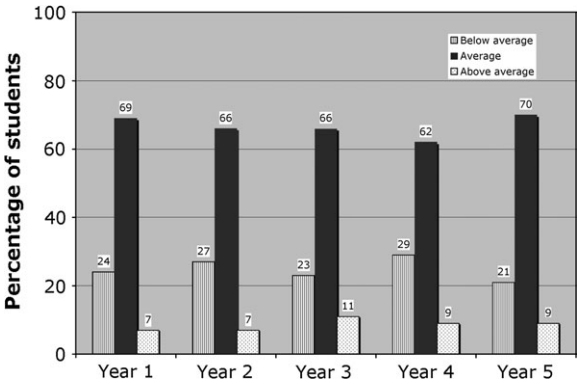

Figure 1 Percentage of students scoring in below-average, average, and above-average range in math from Years 1–5.

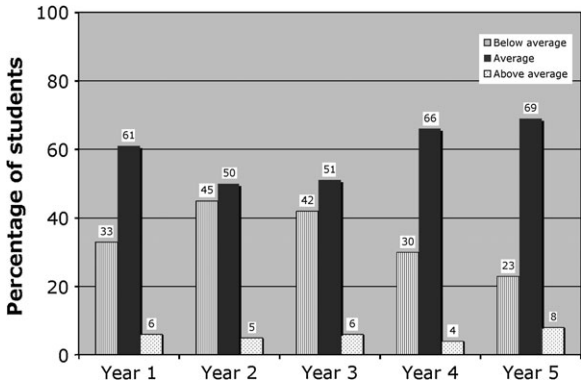

Figure 3 Percentage of students scoring in below-average, average, and above-average range in language/writing from Years 1–5.

regression gives the average annual linear change for a student over the 5 years. The advantage of this approach is that it allowed calculation of change even when there were gaps in the data and was less likely to be subject to year-to-year fluctuations. Once the slopes were calculated for each student, they were averaged across students to give a measure of average annual change.

Because the achievement tests are normed for each grade level, 1 year's progress in 1 year's time should yield a slope of 0, indicating that the student is changing at the expected pace for students in the norming sample at the same grade level. A slope of 0 means that the student's NCE score remains at the same relative standing to the (norm group) peers from year to year. A positive slope indicates that the student is improving relative to other students at the same grade level in the norming group, whereas a negative slope would indicate that the student is falling behind relative to other students at the same grade level. Table 3 shows the mean slope for each content area. The *t* test values and significance levels are shown for a test of the null hypothesis that the average change does not differ significantly from 0 (i.e., that students, on the average, remain at the same relative standing to their hearing peers over the course of the study).

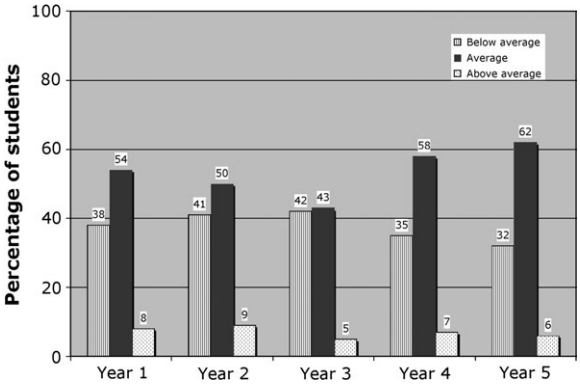

Figure 2 Percentage of students scoring in below-average, average, and above-average range in reading from Years 1–5.

The mean slopes for each content area are positive, indicating that student progress was consistent with, or better than, that made by the norm group of hearing students. Math and reading slopes were not significantly different from 0, but language/writing scores improved significantly across the 5 years of assessment relative to the norm group ($t(149) = 2.82$, $p = .006$). The mean change for language/writing was 1.56 NCEs per year, a change of roughly 7.8 NCEs across the 5 years of the study. Although math change was not statistically significant, the mean annual change was slightly less than 1.0 NCE, suggesting an average change of 5.0 NCEs across the 5 years. One reason for the lack of significance in the math change estimates is the substantial variability of the math slopes, which ranged from almost −46 to 29 NCEs.

Again, because mean slopes can mask variability (as shown in Table 3, the range of slopes was large), we examined the percentage of students who made progress of approximately 1 year in 1 year's time, those who made less than 1 year's progress in 1 year's time, and those who made more than 1 year's progress in 1 year's

Table 3 Mean slope estimates for math, reading, language/writing, and academic competence change

Variable	*n*	Mean	*SD*	Minimum	Maximum	*t* (H_0: $\beta = 0$)	Probability (*t*)
Math change	149	0.98	8.07	−45.57	29.09	1.49	.139
Reading change	146	0.21	5.45	−19.9	13.35	0.47	.636
Language/writing change	149	1.56	6.76	−21.8	22.9	2.82	.006
Academic competence change	160	0.57	3.08	−7.5	10.6	2.34	.021

time. We used a cut point of 3 NCEs to account for measurement error. Figure 4 shows the percentage of students who made an average annual change of less than −3 NCEs (considered to be less than 1 year's progress), those who made an average annual change of between −3 to +3 NCEs (considered to be 1 year's progress), and those who made an average annual change greater than +3 NCEs (considered to be more than 1 year's progress). Approximately 80% of students averaged at least a year's progress in a year's time in each of the three content areas. (Note that Figure 4 also shows the data on academic competence discussed in the next section.)

Classroom Academic Status and Progress

The teacher-rated Academic Competence Scale data were obtained on students in the study for each of the 5 years. Table 2 shows the means, *SD*s, and range of scores for each year. The Academic Competence Scale yields a standard score with a mean of 100 and an *SD* of 15. As can be seen in Table 2, the mean of this DHH sample is within the normal range and little change is seen across years.

Figure 5 shows the percentage of students who scored in the above-average, average, and below-average range for each of the 5 years compared with the norming sample. Again, the data show stability, with approximately 70%–80% of students rated by teachers as being in the average or above-average range each year in terms of academic competence. However, the percentage of students scoring in the above-average range is lower than expected, whereas the percentage in the below-average range is correspondingly higher than expected for a normal distribution.

To examine progress over time, each student's standard scores were regressed on the study year (1, 2, 3, 4, or 5) to determine the average annual slope. As with the standardized achievement data, students who make progress commensurate with the norming group would be expected to have a slope of 0. A slope that differs significantly from 0 represents an increase (when the slope is positive) or decrease (when the slope is negative) in standard score in comparison to the norming group. The average annual slope for academic competence was 0.57 with an *SD* of 3.08. This slope is positive and does differ significantly from

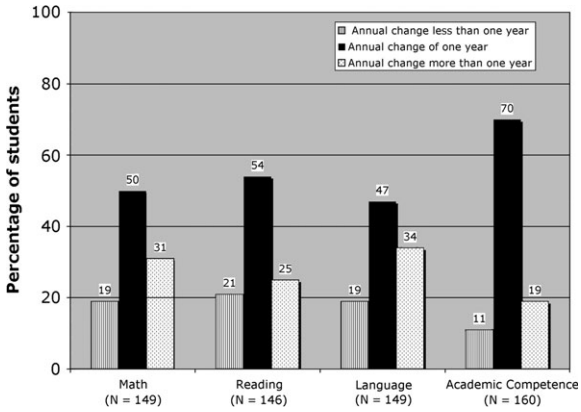

Figure 4 Percentage of students making annual changes of less than 1 year, 1 year, or more than 1 year, in math, reading, language/writing, and academic competence.

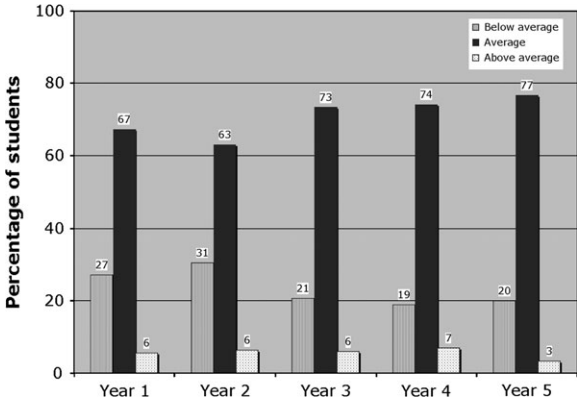

Figure 5 Percentage of students receiving below-average, average, and above-average academic competence scores from Years 1–5.

0 ($t(160) = 2.34$, $p = .021$). Thus, the group, as a whole, made slightly greater gains than expected. However, the range of slopes indicates that some students lost considerable ground, whereas others gained in reference to the norm group. Figure 4 shows the percentage of students who made average, below-average, and above-average annual gain over the 5-year period. We used a cut point of 3 standard score units to allow for measurement error; thus, we considered that students made average progress if the average annual change scores were between −3 and +3 standard score units, below-average progress if the average annual change scores were below −3 standard score units, and above-average progress if the average annual change scores were greater than +3 standard score units. Almost 90% of students made at least average progress; a larger percentage of students made above-average progress than below-average progress.

Variables associated with academic status. It is impractical to examine the effect of the extensive number of variables that might influence or explain academic achievement in DHH students. We therefore excluded demographic variables and historical variables from our analysis and focused on concurrent variables. Demographic variables cannot be changed, and their effects have been well documented (e.g., additional disability and ethnic status). The information we received on historical variables, such as age of onset of hearing loss or initiation of early intervention, was obtained by teachers from student files; their accuracy depended largely on the accuracy of student data kept over the years. A large number of students had missing data, and we therefore decided not to examine the effect of these variables. Concurrent variables, such as communication mode and academic classes attended, were collected during the course of the study and could potentially provide useful information to teachers supporting DHH students. Guided by the literature, we chose the following list of possible explanatory variables: student's preferred mode of communication, parental participation and involvement with the school program, number of general education academic classes attended, classroom communication participation, better ear PTA, and teachers' ratings of students' expressive and receptive communication.

Better ear PTA, parental participation, and number of academic classes attended were obtained from the demographic form. Preferred mode of communication was obtained from students' responses on the four items of the CPQ that asked students to select their preferred mode of communication to and from teachers and peers. Classroom communication participation was the student's average score on the Understanding Teacher, Understanding Students, and Positive Affect scales of the CPQ (see Antia et al., 2007, for an explanation). Teachers' ratings of expressive and receptive communication were obtained annually from each student's teacher of DHH, using the Gallaudet three-point Functional Performance Scale.

We first examined the correlations between the explanatory variables and academic performance year by year; because no trends were apparent, we averaged the explanatory variable scores for each student across all 5 years and did the same with the standardized achievement and academic competence scores. Thus, these correlations represent the correlations between the averaged explanatory variables and the averaged achievement and academic competence scores (averaged across years for each student). The Pearson correlations, proportion of explained variability (r^2), probability (significance levels), and number of observations for each correlation are presented in Table 4 (significant correlations are shown in bold). Each of the communication variables, whether teacher rated or student rated, was significantly correlated with academic achievement. Students who received high ratings on expressive and receptive communication from the teacher of DHH had higher academic achievement scores. Students who rated themselves as being comfortable communicating with teachers and peers on the CPQ and students who expressed a preference for oral communication also received higher academic achievement scores. Parental participation was significantly positively correlated with all academic outcomes. Better ear PTA was significantly correlated only to reading achievement. The number of general education classes attended was not significantly correlated with any outcome, possibly because there was little variation; most students were taking the same number of general education academic classes.

Statistically significant correlations may or may not explain a substantial proportion of the variability

Table 4 Pearson coefficients (r) and proportion of variability (r^2) between explanatory variables, achievement scores, and academic competence scores averaged across 5 years

	Math r (r^2), probability, n	Reading r (r^2), probability, n	Language/writing r (r^2), probability, n	Academic competence r (r^2), probability, n
Preferred mode of communication	.35 (.12), <.0001, 173	.44 (.19), <.0001, 175	.40 (.16), <.0001, 174	.28 (.08), <.0001, 188
Parental participation	.33 (.11), <.0001, 171	.26 (.07), .0006, 173	.31 (.10), <.0001, 173	.32 (.10), <.0001, 188
Number of general education classes attended	.09 (.008), .244, 173	.03 (.0009), .650, 175	.04 (.002), .584, 174	.13 (.02), .064, 191
Student self-rated classroom participation	.34 (.12), <.0001, 172	.43 (.18), <.0001, 174	.40 (.16), <.0001, 173	.43 (.18), <.0001, 188
Better ear PTA	−.06 (.004), .425, 160	−.20 (.04), .012, 161	−.11 (.01), .186, 160	−.11 (.01), .136, 175
Teacher-rated expressive communication	.36 (.13), <.0001, 172	.48 (.23), <.0001, 174	.43 (.18), <.0001, 173	.38 (.14), <.0001, 189
Teacher-rated receptive communication	.40 (.16), <.0001, 172	.47 (.22), <.0001, 174	.45 (.20), <.0001, 173	.46 (.21), <.0001, 189

Note. PTA, pure tone average.

in outcomes. A useful way of understanding the magnitude of correlations is to look at the square of the correlation coefficient (r^2), which is the proportion of variability that can be accounted for by the explanatory variables (Cohen, 1988). Cohen (1988, pp. 79–80) suggests that, as a rule of thumb, $r = .10$ be considered a small effect size and $r = .30$ be considered a medium effect size. Using these guidelines, the communication variables (preferred mode, classroom participation, expressive and receptive communication) can be considered to have a medium effect size. They account for between 12% and 16% of the variability in math achievement, 18% and 23% of the variability in reading achievement, 16% and 20% of the variability in language/writing, and 8% and 21% of the variability in teacher-rated academic competence. Parental participation and degree of hearing loss can be considered to have a smaller effect size. Parental participation accounts for between 7% and 11% of variability in achievement, whereas better ear PTA accounts for only 4% of variability and only in reading achievement.

Discussion

The academic status and progress data of this sample of DHH students in general education classrooms provide us with both good news and not-so-good news. The good news is that the majority of these students are achieving within the normal range (i.e., between +1 and −1 *SD*) of hearing students on standardized tests of math, reading, and language/writing, and most are perceived by their teachers as performing academically within the range of their classmates. Most of the students are also making 1 year's progress in 1 year's time, and, in the area of language/writing, many are making more than 1 year's progress in a year's time. The not-so-good news is that the group is approximately half an *SD* behind norms on standardized achievement tests and, despite making progress, may not be closing the gap particularly in reading.

Normative Academic Status and Progress

Previous studies have reported that DHH students lag academically far behind their hearing peers and that

the average performance in reading comprehension is approximately six grades below their hearing peers by age 15 (Karchmer & Mitchell, 2003). The DHH students in this study sample are achieving, on the average, about half an *SD* behind the norms for hearing students on standardized achievement tests, thus showing a much smaller gap than the data reported by Karchmer and Mitchell (2003). Moreover, these results are not due to a few students who are doing exceptionally well. As shown in Figures 1–3, the majority of students are scoring in the average and above-average range each year. Over the 5-year period, an average of 71%–79% of students achieved at the average or above-average level in math, 48%–68% in reading, and 55%–77% in language/writing.

Previous researchers (Jensema, 1978; Wolk & Allen, 1984) have reported that the typical growth rate (at least in reading comprehension) is about one-third of a grade equivalent in 1 year's time. The majority of students in this study made an average of 1 year's change in 1 year's time in math and reading. They made more than 1 year's change in 1 year's time in language/writing. Thus, they are making adequate grade-to-grade progress, an appropriate indicator of academic achievement.

There are several reasons why the data from this sample may be different from other reported achievement data on DHH students. The sample in this study includes a large number of hard-of-hearing children who are often overlooked in other research because they are difficult to locate. Students are often placed in general education because it is the belief of their teachers and parents that they can thrive in these classrooms—in other words, these students are not randomly selected. It is quite likely that they are not representative of the general population of DHH students on hard-to-measure variables such as motivation to succeed. Another reason that these students may be performing academically higher than those in previous studies is because they might have more exposure to the general education curriculum than students educated in self-contained classrooms (Soukup, Wehmeyer, Bashinski, & Bovaird, 2007). Other research with DHH students (Holt, 1994; Kluwin, 1993) has indicated that access to the general academic curriculum is associated with higher achievement and progress. Finally, as noted in the introduction, it may be that these students are influenced by academic press and encouraged by parents, teachers, and peers to achieve.

The students in this study were enrolled in programs that provided support to DHH students in general education through itinerant teachers of DHH and interpreters. The fears of many educators that the inclusion movement would result in placing students in general education classrooms without support appear not to be true for this sample. Access to the general education curriculum is not achieved by simply placing a student in a classroom. DHH students need communication access, classroom modifications, and other necessary accommodations to be successful. We interpret the data from this study to indicate that, given appropriate support, many DHH students in general education classrooms can make a year's progress in a year's time.

The not-so-good news is that the group remains about half an *SD* below the hearing norms, and the rate of progress, although adequate, may not be sufficient to close this gap. Because we did not obtain comparative data from hearing classmates, comparing students only to national and state norms, we cannot definitely conclude that they are falling behind their classmates. However, these data do indicate that DHH students in general education classrooms may not be achieving to their full potential.

An interesting pattern of achievement is seen in Figures 1–3. For both reading and language/writing, there appears to be a dip in the percentage of students achieving in the average and above-average range between Years 1 and 3, followed by an upward trend in Years 4 and 5. We hypothesized that this dip might reflect the numbers of students (a) transitioning from lower elementary to upper elementary grades where they make the change from "learning to read" to "reading to learn" or (b) transitioning to middle or high school. We did find that the highest percentage of students moved into fifth and ninth grades during Years 2 and 3. A possible explanation for the dip then is that it might reflect the demands of fifth grade when students are required to read and write more in content areas and the demands of high school when homework requirements, teaching styles, and support services may change.

Students are scoring higher in math than in reading or language/writing, a trend also reported by previous researchers (Allen, 1986). It is interesting to note that students made the most progress in the area of language/writing and the least in the area of reading. These results may reflect the components of these particular tests. The language/writing tests include items on the conventions of written language, an area in which DHH students do comparatively well (Antia, Kreimeyer, & Reed, 2005). The reading tests emphasize vocabulary and comprehension, areas in which DHH students show specific weaknesses. Our data complement that of other researchers (Karchmer & Mitchell, 2003; Traxler, 2000), confirming that reading continues to be difficult for many students including those with less-than-severe hearing loss.

Classroom Academic Status and Progress

When general education teachers compare the DHH students to their hearing classmates, they report that between 67% and 77% of them are academically within the normal range. These data are comparable to, or better than, those reported by Power and Hyde (2002) who reported that 66% of DHH students in general education were academically competitive with their classmates. Our results also show that the percentage of students in the average range increased over time, whereas the percentage of students in the below-average range decreased over time. As the students in the above-average range remained stable, we conclude that several students moved from below average to average during the 5-year period. Only 20% of students were in the below-average range by the end of the study, a percentage close to the 16% of students expected to be below average in a normal distribution. However, only 3%–7% of DHH students were reported by their teachers to be functioning in the above-average range, well below the 16% expected in a normal distribution. Again, these data might indicate that several DHH students are under-performing or not reaching their full potential.

Only 11% of students made below-average annual gain (defined as an average annual decrease of 3 or more standard score points) in teacher-rated academic status. In contrast, 19%–21% of students made below-average annual gain on the standardized achievement tests. These DHH students seem to be performing similarly to their classmates (as reported by teachers) but below national and state norms. Because we did not collect data on hearing classmates, we cannot determine whether they, too, were achieving below national or state norms. However, teachers and administrators may need to take into account both normative and classroom achievement to obtain a complete academic picture of a student. It is quite possible that a DHH student in a low-achieving school will perform as well as classmates but fall behind on standardized achievement tests. The reverse can also be true as pointed out by Blair et al. (1985), that is, a DHH student can show average achievement on standardized tests, yet be falling behind classmates academically.

Explanatory Variables

A secondary purpose of this paper was to examine the relationship of selected variables on achievement. The influence of demographic variables, such as ethnicity, has been well documented both for DHH and hearing students (Farkas, 2008; Powers, 2003). Examining the influence of historical variables such as early identification and intervention was beyond the scope or intention of this study. However, we examined the relationship of several concurrent variables, namely, preferred mode of communication as reported by the student, parental participation as reported by teachers, number of general education classes attended by the student, student-rated classroom participation, better ear PTA, teacher-rated expressive communication, and teacher-rated receptive communication. We chose these variables based on the literature and (except for PTA and mode of communication) because of their implications for provision of services by teachers of DHH. For example, if expressive communication was found to be related to academic outcomes, teachers of DHH could focus their effort on improving this specific skill in students. If low levels of classroom participation were associated with lower levels of academic achievement, teachers of DHH could make it a practice to evaluate student classroom participation and act on the information obtained.

Although degree of hearing loss is not a variable that can be influenced by teachers, it is a variable of interest to the field, and researchers have reported that greater degree of hearing loss depresses academic achievement (Allen, 1992). We found that degree of hearing loss was significantly related only to reading achievement, not to math, language/writing, or classroom academic status. Previous researchers have also reported a lack of relationship between degree of hearing loss and outcome variables (Moeller, 2000; Most, 2004, 2006; Powers, 2003). This does not mean that hearing loss itself does not influence achievement. On the contrary, if we look at the somewhat depressed achievement of the group as a whole in comparison to the norming standards, these data could be interpreted to mean that any degree of hearing loss puts students at risk for academic achievement. An assumption in the field has been that hard-of-hearing students need minimal support once they receive adequate amplification. However, hard-of-hearing students may be identified late or receive few services once identified. Their mostly intelligible speech might mislead teachers and administrators to overlook the difficulties they experience with classroom participation. Thus, little attention may be given to mitigating the effect of their hearing loss in the classroom.

Degree of hearing loss is often used as a proxy for communication ability. However, we decided that it was better to measure students' communication directly, using both teacher and student perspectives. We chose measures that required the teachers and students to rate communication within the context of the classrooms in which students received instruction. Each of the communication measures, namely, teacher-rated expressive and receptive communication and student-rated communication participation within the classroom, was significantly correlated to math, reading, and language/writing achievement, as well as to teacher-rated academic competence. Although, from a research standpoint, it would be of interest to determine which of these variables was the most important in predicting academic success, it was not possible from our data to isolate a single variable. In additional analyses, not presented in the Results section, we correlated teachers' and students' ratings of communication and conducted several different multiple regression analyses to try and isolate those variables that might best explain academic achievement. These regression analyses are not presented because they added little additional meaningful information beyond that yielded by the correlations. An examination of Table 4 shows that the magnitude of the correlations between the communication variables and academic achievement are quite similar. Furthermore, the communication variables are related to one another; therefore, it is misleading to isolate a single variable as the best predictor of academic achievement. The reader should be aware that the multiple regressions do indicate that combinations of the explanatory variables do not increase prediction of academic achievement in a simple additive manner and should take this into account when interpreting the correlations.

We suggest that the teacher-rated and student-rated communication variables although related are not identical and should be considered as different approaches to measuring a complex variable that can be thought of as communication competence. Communication competence is the degree of success in communicating within a specific context (Owens, 2001). Thus, communicative competence is broader than language ability and could include skills such as using an interpreter, communication assertiveness, communication repair, and the ability to match communication mode and register to one's audience. The implications of these data are that communicative competence, broadly conceived and exhibited within-students specific instructional settings, is related to academic success.

High parental participation was positively related to all academic outcomes; the correlations are significant, but the effect size was relatively low and the data were obtained by teacher's report. It is likely that the measure we used was not sufficiently sensitive. The parental participation score was a sum of the number of different school-related activities in which parents participated. We had no measure of the intensity of participation (e.g., a parent who attended one parent–teacher meeting received the same score as a parent who attended several) or the degree to which parents supported their children at home by communicating with them or helping them with homework. However, even this simple measure of parental participation in school yielded a significant correlation, highlighting the need for parents to be involved in their children's education.

Neither the communication variables nor parental participation explained more than a quarter of the variability in academic outcomes, emphasizing the complexity of interrelated factors that influence academic achievement. The remaining variability may be explained partially by demographic and historical variables that we did not examine. However, Reed et al. (2008) have pointed out that student, family, and school variables interact in complex ways to influence student outcomes.

Implications for Research and Practice

The most important implication is that students in general education classrooms can achieve at a higher level than reported by previous researchers and also can make adequate progress in these classrooms implying that DHH students are capable of learning alongside hearing peers. However, students with any degree of hearing loss may be at risk for achieving lower than their potential, so even those with mild hearing loss should be monitored and provided services as necessary.

One of the difficulties of a study of DHH students in the public schools is the issue of sample representativeness. Despite our efforts to enroll students from ethnic minority backgrounds, the proportion of these students in our study was only 36%, which is not representative of the 50% reported for the general school population in the Western United States in 2001 at the beginning of the study (National Center for Education Statistics, 2008). Also, the lesser degree of hearing loss of the sample as a whole is reflective of DHH students in general education but not necessarily of DHH students nationwide (Gallaudet Research Institute, 2006).

Another sampling issue is specific to longitudinal studies. Over time, students who do poorly may be placed in center schools, whereas those who do well may stop receiving services and be lost to the special education system. We tried to follow all students who entered the study; thus, we continued to collect data on students who in subsequent years received all their instruction from teachers of DHH as well as those who stopped receiving services. Even so, the danger of longitudinal studies is that data cannot be obtained on all participants for the course of the entire study and that the students who drop out, or for whom data are not available, differ in some manner from the remaining participants. For this reason, we believe that replications in other states and programs would be wise before generalizing from this single study to the larger population of DHH students. Also, we did not obtain data on a matched group of hearing classmates. Future researchers may want to include such a comparison group.

Teachers of DHH who support these students are not able to change demographic or historical variables that contribute to academic success for these students, but they can focus on the communication skills and communication supports that influence success. Communication skills should, of course, include language and reading skills, which are the traditional focus for teachers of DHH but might also include strategies for using interpreters effectively, participating in classroom discussions, repairing communication breakdowns, and self-advocating to improve communication environments. Teachers of DHH should ensure that appropriate communication supports (such as interpreters) are in place and should work with general education teachers to change aspects of the classroom environment and activities for students having difficulty with classroom communication participation.

Finally, these results are for a sample of students in two states. Additional longitudinal studies of the progress of DHH students will add to our knowledge of the capabilities of these students, the areas in which they need the most support from teachers of DHH, and the expectations that we should hold for their academic success.

Funding

U.S. Department of Education, Office of Special Education Programs (H324C010142).

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Received August 27, 2008; revisions received February 13, 2009; accepted March 19, 2009.