

November 2006



SEELS

A NATIONAL PROFILE OF STUDENTS WITH HEARING IMPAIRMENTS IN ELEMENTARY AND MIDDLE SCHOOL:

A Special Topic Report from the Special Education Elementary Longitudinal Study

Prepared for:

Dr. Lisa Holden-Pitt
Office of Special Education Programs
U.S. Department of Education

Prepared by:

Jose Blackorby and Anne-Marie Knokey

SRI Project P10656

SEELS has been funded with federal funds from the U.S. Department of Education, Office of Special Education Programs, under contract number ED-00-CO-0017. The content of this publication does not necessarily reflect the views or policies of the U.S. Department of Education nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. government.



SRI International
333 Ravenswood Avenue Menlo Park, CA 94025



A National Profile of Students with Hearing Impairments in Elementary and Middle School

There are more than 70,000 students nationwide who, under the Individuals with Disabilities Education Act (IDEA), receive special education services primarily because of a hearing impairment.¹ This is a unique population of students who differ from students in the general population as well as from most other students who receive IDEA services. Some degree of hearing loss characterizes all students within the hearing impairment category, and that loss may or may not have implications for functioning both in and out of school.² Hearing loss frequently affects the development and use of receptive and expressive language across life settings, and these students frequently have academic outcomes that lag those of the general population. However, students with hearing impairments are not a homogeneous group, particularly with respect to the degree of hearing loss. Some students with hearing impairments may have mild loss, rely on spoken language for communication, and use a hearing aid. Others may have severe/profound hearing loss and may primarily use sign language to communicate with others. Differences such as the students' degree of hearing loss can affect not only the modes of communication they use, but also the types of the schools they attend, curriculum modifications and accommodations they receive, and their success in a variety of domains. The diverse nature of this group, a history of relatively low academic achievement, particularly regarding literacy, and the fact that many individuals with hearing impairments are part of a unique culture make this an important group on which to focus.

The data in this report come from the Special Education Elementary Longitudinal Study (SEELS), a project funded by the Office of Special Education Programs of the U.S. Department of Education. It includes a nationally representative sample of more than 11,000 students with disabilities (including more than 1,000 students who received IDEA services for a hearing impairment as their primary disability) who were ages 6 through 13 in 2000. SEELS has collected longitudinal information on a large range of student characteristics, experiences, services, and outcomes from parents, teachers, and students; thus, it provides a wealth of nationally representative information on students with hearing impairments.³ SEELS students were ages 8 to 15 at the time data were collected for this report.

¹ U.S. Department of Education. (2003). Twenty-five Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act. Washington, DC: Author.

² The term "hearing impairment" used in this report is consistent with legislative terminology and refers to deaf and hard-of-hearing students who receive IDEA services through an individualized education program (IEP) for a hearing impairment as their primary disability category. Degree of hearing loss is typically established through audiologists' tests not available in this study. In this report, hearing loss was identified through the parent report.

³ SEELS has collected data in three waves; this approach allows for longitudinal analysis. At the time of this report, waves one and two, separated by 1 year, were available. The results presented here are from the second wave of data collection and come from the SEELS parent interview,

The purpose of this special topic report is to provide a national picture of the characteristics, background, programs and services, and outcomes for students with hearing impairments. This report first discusses the parent-reported level of students' hearing loss and students' demographics.⁴ Then it describes students' communication functioning, social and cognitive skills, school programs, practices, and instructional practices and accommodations, and outcomes as these relate to students' degree of hearing loss and their school setting.⁵

Degree of Hearing Loss

Some degree of hearing loss is the characteristic that is shared by students who receive IDEA services for a hearing impairment. The extent of hearing loss generally has implications for students' expressive and receptive language functioning; therefore, it may affect students in one or more important domains of life. The degree of hearing loss can be measured accurately through tests that determine the intensity level (in decibels) that the student can detect at each of a range of frequencies. However, the methodological protocol used for the large-scale data collection in this study did not include this type of audiometric testing of individual students; thus, the reports of students' general degree of hearing loss were obtained through the parent interviews. Although such reports are important and valuable, they cannot be fully equated with the results of formal evaluations conducted by trained audiologists. It is possible that reports by parents of students with hearing impairments reflect a combination of their perception of student functioning and the results of formal evaluations. This parent-reported hearing loss among this population of students receiving special education services for hearing impairments as their primary disability serves as the organizing framework for many of the analyses in this report. Parent-reported degree of hearing loss is shown in Exhibit 1.

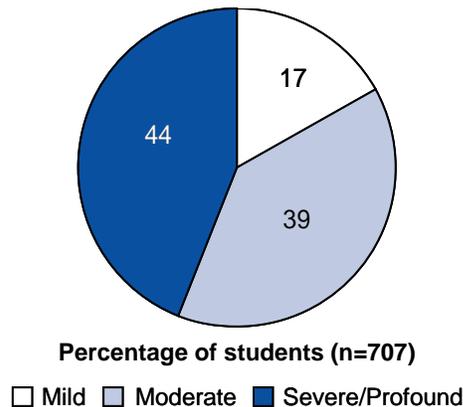
- More than 4 in 10 students with hearing impairments are described by parents to have loss that is "severe/profound." Slightly more than 3 in 10 students have hearing loss that parents characterized as "moderate," and fewer than 1 in 5 students with hearing impairments are reported to have "mild" hearing loss.

language arts teacher questionnaire, school program questionnaire, and student assessment. The sample size of students who have valid information for each exhibit is included in each exhibit. Further information about SEELS is available at www.seels.net.

⁴ The data focus on students who were reported by their school district to receive IDEA services for hearing impairment. By wave two, 6% of these students were reported by their schools or parents to no longer be receiving special education services.

⁵ Sample sizes and associated standard errors for the estimates presented in this report can be found in Appendix A.

Exhibit 1
Parent-Reported-Level of Hearing Loss

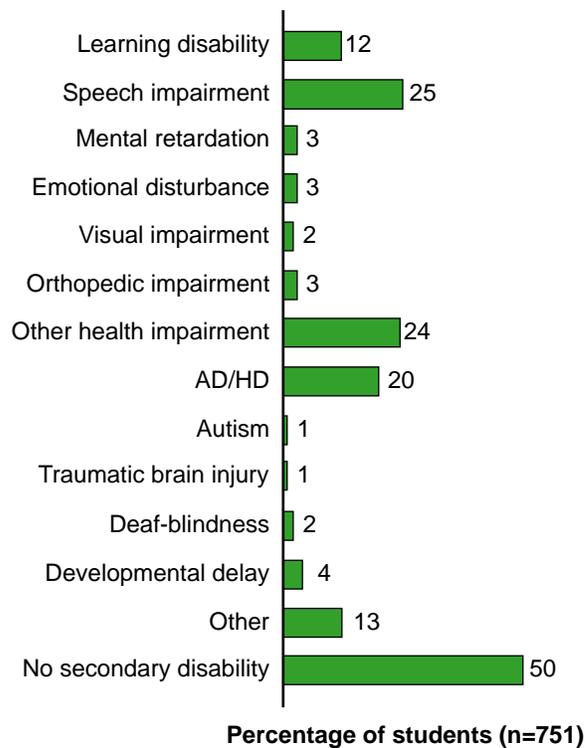


Secondary Disabilities Reported by Parents

The focus of this report is on elementary/middle school age students receiving special education services through IEP and classified with hearing impairment as their primary disability. However, students may also face educational challenges resulting from secondary disabilities. To address this issue in SEELS, parent interviews report a range of primary and secondary disabilities that may affect their children's education. Beyond the difficulties associated with the hearing loss, parents of some of these students also report that the students face further challenges in connection with additional disabilities representing the various federally-defined categories. Students with such secondary disabilities may face additional hurdles in achieving success (Exhibit 2).

- More than one in five students with hearing impairments are reported by their parents to have one or more of the following: speech/language impairments, other health impairments, or Attention Deficit/Hyperactivity Disorder (AD/HD).
- One in 9 students with hearing impairments are reported to have learning disabilities.
- Secondary disabilities have varying implications for students' educational success. Thirty-seven percent of students with hearing impairments are reported to have one or more secondary disabilities commonly associated with cognitive implications (learning disabilities, mental retardation, AD/HD, autism, or traumatic brain injury). By comparison, 25% have disabilities with health or communication implications.
- Half of students with hearing impairments are reported to having no secondary disability identified.

Exhibit 2
Parent-Reported Secondary Disabilities among Students Classified with Hearing Impairments as Primary Disability



Demographic Characteristics

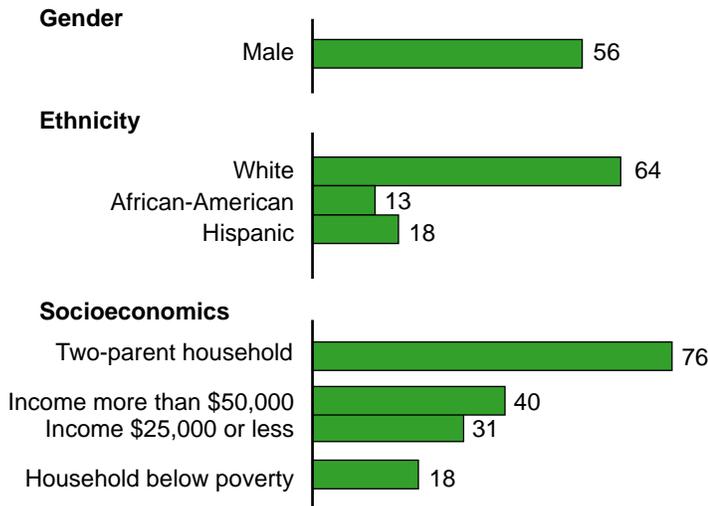
The demographic characteristics of students with hearing impairments differ when compared with same-age students in the general population (Exhibit 3).

- Approximately 56% of students with hearing impairments are male—a percentage marginally higher than for their peers in the general population.
- Students with hearing impairments generally mirror the ethnic distribution observed among same-age peers without disabilities. Sixty-four percent of students with hearing impairments are white, 13% are African-American, and 18% are Hispanic. In the general population, 66% are white, 16% are African-American, 13% are Hispanic, and 5% are other races/ethnicities.⁶
- Socioeconomic factors may play a part in increasing the risk of marginal outcomes for all students, including those with hearing impairments. Although approximately 76% of students with hearing impairments live in two-parent households, about 18% live in households with incomes below the federal poverty level. This is somewhat higher than the 16% of students in the general population who live in poverty.⁷

⁶ The general population numbers were calculated with data from the National Household Education Survey (1998), May 12, 1998, which can be found at the website <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=98246>.

⁷ From U.S. Census Bureau. Table 23, Single years of age—Poverty status of people in 2000. Retrieved 7/9/04 from http://ferret.bls.census.gov/macro/032001/pov/new23_001.htm.

Exhibit 3
Selected Demographic Characteristics of Students with Hearing Impairments



Percentage of students (n=650 to 751)

Communication Skills

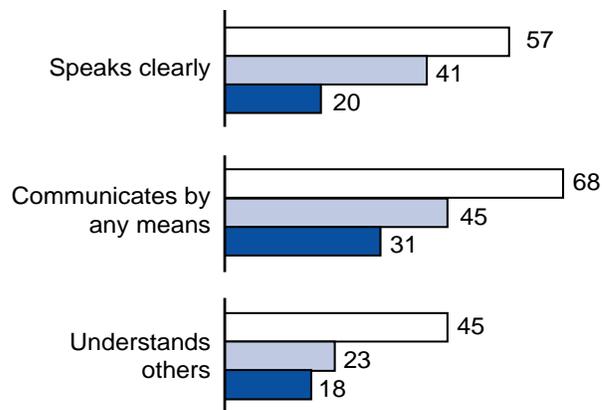
Effective communication is critical for both academic success and positive social interactions for all children. For hearing students, hearing and speech are the primary mechanisms used for communicating with and understanding others. Because hearing loss relates directly and indirectly to these two functions, it can affect a student’s ability to function in these areas. Further, depending on the level of loss, students with hearing impairments may use fundamentally different modes of communication than their hearing peers. Exhibit 4 depicts parents’ ratings of the speech, communication, and understanding abilities of students with hearing impairments in light of their reported level of hearing loss.

- Students with hearing impairments exhibit a range of communication skills. In each dimension of communication, a substantial number of students perform as well as hearing peers of the same age. However, SEELS data also suggest that significant numbers of students with hearing impairments do not communicate as effectively as other students of the same age. For example, 43% to 80% of students with hearing impairments, depending on level of loss, have at least a little trouble speaking clearly. These rates of speaking difficulty are comparable to those of other students with disabilities who have identified speech difficulties (e.g., students with speech/language impairments) but lower than those of others whose disabilities do not specifically imply difficulties in speaking (e.g., students with learning disabilities).
- Students’ abilities to communicate “by any means” (i.e., speech, sign, etc.) also illustrate a range of functioning. Depending on level of hearing loss, between 31% and 68% of students with hearing impairments were reported

by their parents to be able to carry on conversations as well as same-age peers.

- According to parents, students with hearing impairments are reported to have trouble “understanding what others say.” Depending on the level of hearing loss, fewer than one-quarter to nearly one-half of students with hearing loss understand others as well as their same-age peers do.
- Not surprisingly, the level of hearing loss among students with hearing impairments is related to all three communication measures. In each of these areas, students with parent-reported severe/profound hearing loss are more likely to have difficulties than are their peers with mild hearing loss. Level of hearing loss is noticeably more influential upon students’ ability to ‘speak clearly’ than it is upon students’ ability to ‘understand the speech of others,’ as demonstrated by the relatively high proportions of students with mild versus severe/profound hearing impairments whose respective communication abilities are up to that of their hearing peers. Note also that very little increase in proportion of students able to ‘understand others’ is realized when the level of hearing loss is reduced from severe/profound to moderate. In both instances, more than three-fourths of the students are reported to have difficulty understanding the speech of others.

Exhibit 4
Parent-Reported Communication Functioning, by Level of Hearing Loss



Percentage of students rated “as well as same-age peers” (n = 604 to 744)

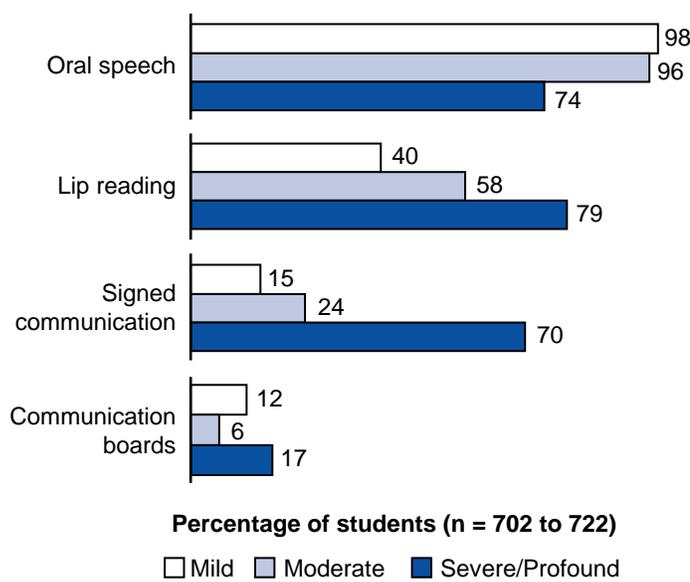
□ Mild □ Moderate ■ Severe/Profound

Communication Modes

Although most hearing students rely on speech to communicate with others, students with hearing impairments are likely to use a range of communication modes. For example, students with hearing impairments may use some form of signed communication, lip reading, or assistive technologies, such as hearing aids, cochlear implants (CI), communication boards, in communication with others (Exhibit 5).

- Oral speech is the most commonly cited form of communication among students with hearing impairments just as for hearing peers. The meaning of oral speech for communication varies depending on whether students use speech or sign as their predominant means of communication. The majority of students with hearing impairments report using oral speech as a communication mode, but using other forms of communication (such as signing, lip reading, cued speech, and communication boards) in conjunction. Ninety-one percent of students with severe/profound hearing loss use both oral speech and another form of communication. Most students with mild to moderate hearing loss use both oral speech as well as another form to a lesser degree (52% for mild and 69% for moderate hearing loss).

Exhibit 5
Parent-Reported Communication Modes, by Level of Hearing Loss



Oral speech—Learning to speak orally in a normal voiced speech.

Lip reading—Watching speakers' lips to determine what is being said.

Signed communication—Any type of communication system using the hands. The most common systems are American Sign Language (ASL) and Signed English.

Communication boards—A system that allows students to communicate by pointing to an item customized for them, often using computer technologies.

- Lip reading is a much more common aid to receptive communication for students with severe/profound (79%) or moderate (58%) hearing loss than among peers with mild (40%) hearing loss.
- Signed communication (in a variety of forms) is common among students with severe/profound hearing loss; 70% of them are reported to use it. Considerably fewer students with moderate hearing loss (24%) or students with mild hearing loss (15%) are reported to use signed communication.
- Communication boards are much less commonly used than other communication modes and are most commonly used by students with severe/profound hearing loss.

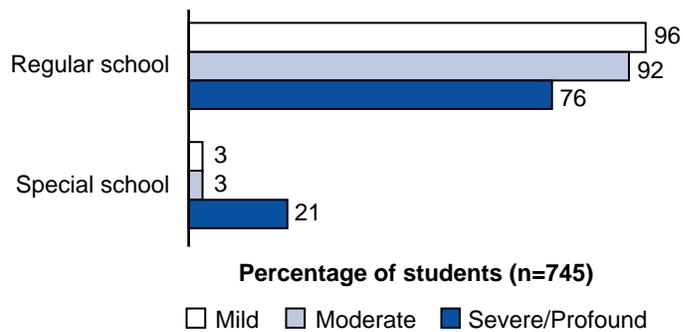
School Type

Most students with disabilities, including those with hearing impairments, attend regular public schools that serve students in the general population as well as a smaller number of students with disabilities. With the passage of the Education

for all Handicapped Children Act in 1975, more students with hearing impairments began attending regular schools than special schools (Schildroth and Hotto, 1992).⁸ Regular schools often have a range of placement options that include varying combinations of regular and special education students. However, historically some students with hearing impairments have attended special schools that are designed to serve the specific needs of this population and are attended only by students who share that disability. There are generally no students without disabilities in these schools. Such “special schools” are found in all 50 states, but their enrollment has been decreasing and several of these schools have closed in recent years.

Exhibit 6 shows an association between the type of school students attend and students’ respective hearing loss levels.

Exhibit 6
Parent-Reported Schools Attended, by Level of Hearing Loss



- More than 90% of students with mild or moderate hearing loss attend regular schools. However, 21% of students with severe/profound hearing loss attend special schools.

Educational Goals

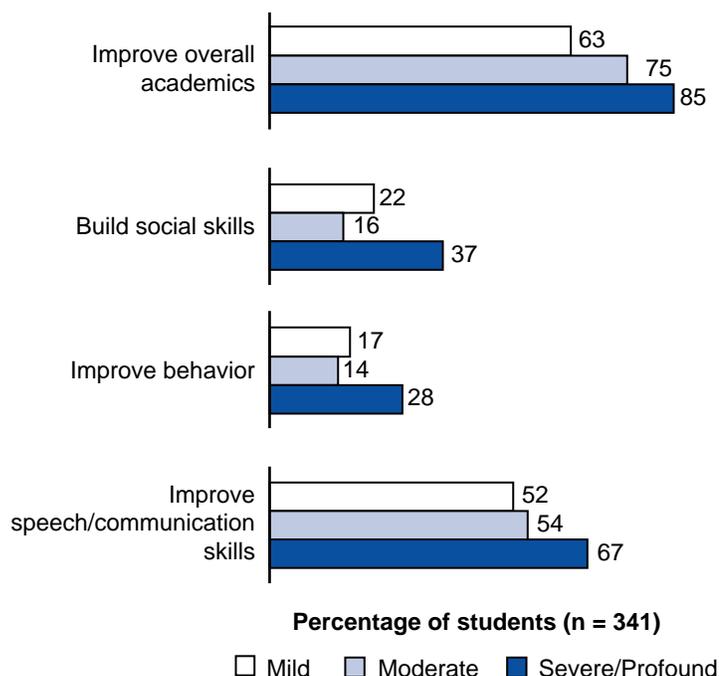
One of the hallmarks of special education is the principle of goal-oriented instruction to meet students’ individual needs. The annual process of examining student needs; mapping curriculum, instruction, and accommodations to those needs; and measuring progress toward them remains a compelling model for all students served under IDEA, including those with hearing impairments. Exhibit 7 depicts the teacher-reported educational goals of students with hearing impairments as they vary by level of hearing loss.

- The improvement of overall academic performance is the most frequently cited goal for 63% or more of students with hearing impairments, regardless of level of hearing loss. The focus on academics is somewhat more pronounced among students whose parents characterized their hearing loss as “severe/profound.”

⁸ Schildroth & Hotto. (1992), Hearing impaired child under age 6: Data from the Annual Survey Hearing Impaired Children and Youth. *American Annals of Deaf*, 137(2), 168-175.

- Nonacademic goals also are cited for many students with hearing impairments. For example, the improvement of speech and communication skills is reported as a significant goal for more than half of students with hearing impairments, regardless of level of hearing loss.
- Smaller numbers of students with hearing impairments have goals to build social skills or to improve behavior, and such goals also are related to level of hearing loss. These two areas are more likely to be goals for students with severe/profound hearing loss than for their peers with lesser hearing losses.

Exhibit 7
Teacher-Reported Educational Goals, by Level of Hearing Loss



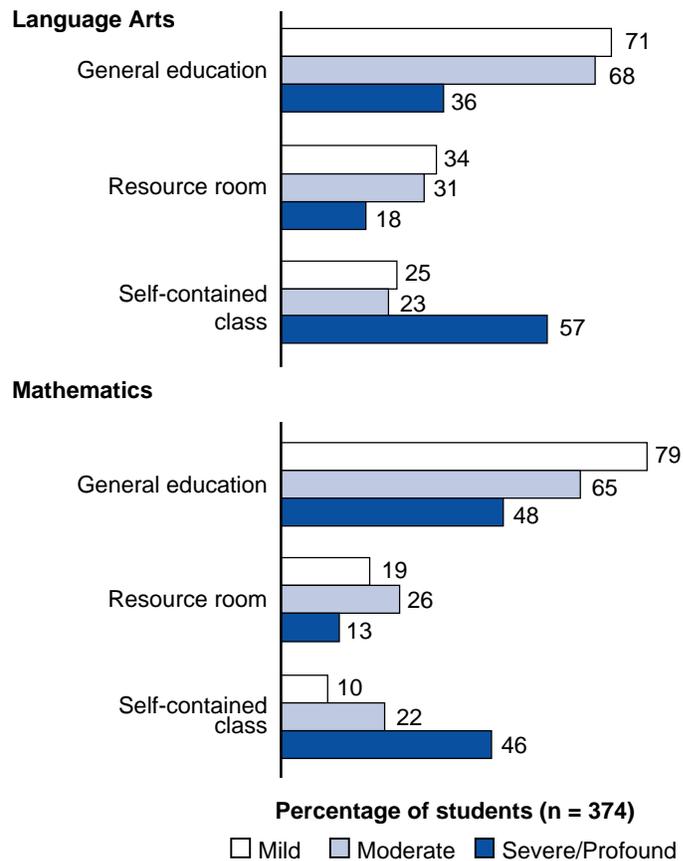
Instructional Settings

Classes

Placement within instructional settings has been an ongoing issue for students with hearing impairments, as well as other students with disabilities. Deciding what type of instructional setting is best for a child, noting the advantages and disadvantages of various instructional settings, can be difficult when deciding a child’s placement. In classifying instructional settings, SEELS defines special classes as being those attended predominantly by students with disabilities. For students with hearing impairments in special schools, all of their classes are considered ‘special’ by this definition. For students in regular schools, however, a range of instructional settings is possible, including regular education classrooms, resource rooms, and self-contained classes specially for students with disabilities though not necessarily for students with hearing impairments exclusively (Exhibit 8).

- For language arts as well as mathematics, students with hearing impairments are represented by noteworthy proportions in each of the three instructional settings listed in Exhibit 8.
- In language arts, approximately 70% of students with mild or moderate hearing loss receive instruction in regular education settings. Thirty-six percent of students with severe/profound hearing loss receive language arts in regular education.
- The prevalence of regular education instruction for mathematics is comparable for students with mild versus moderate hearing loss, though less common among students with severe/profound loss.
- Resource rooms are settings where students receive instruction for a portion of their day in class, primarily with a small number of other students with disabilities. About one-fourth to one-third of students with moderate hearing loss receive language arts or mathematics instruction in resource rooms.
- Although students with severe/profound hearing loss are most likely to receive language arts and mathematics in self-contained settings, substantial numbers of students with mild hearing loss also receive instruction in such settings.

Exhibit 8
Teacher-Reported Instructional Settings for Language Arts and Mathematics Instruction in Regular Schools, by Level of Hearing Loss



Note: The percentages across settings in Exhibit 8 do not sum to 100% because students can participate in more than one instructional setting.

Instructional Groupings

Altering the size of an instructional grouping is one of the most common strategies that teachers can use to accommodate the diverse needs of students. Many of the most promising research-based practices reduce the size of the instructional group in one way or another. And some research suggests that smaller classes improve learning for many students. As shown in Exhibit 8, students with hearing impairments participate in a variety of classes in a variety of settings. Exhibit 9 shows the instructional groupings—whole-class, small-group, or individual instruction—used in the context of language arts instruction by classroom setting.

Results in Exhibits 9 and 10 include students across all levels of hearing loss, organized into two categories of classroom settings. Integrated settings are settings in which students with hearing impairments attending regular schools are included in regular education classrooms for most of their school day, but may receive language arts instruction in resource rooms. Self-contained settings refer to classrooms in regular schools or special schools in which students with hearing impairments receive language arts instruction in classrooms with other students with disabilities, but usually not with regular education students.

Exhibit 9
Teacher-Reported Instructional Groupings, by
Language Arts Classroom Setting

| | Integrated Settings | Self-contained Settings |
|--|------------------------|----------------------------|
| Percentage of students frequently receiving language arts via: | | |
| Whole-class instruction | 71 | 59 |
| Small-group instruction | 34 | 47 |
| Individual instruction with teacher | 34 | 48 |
| Subsample size— | 303 | 323 |

Note: The percentages across instructions in Exhibit 9 do not sum to 100% because students can participate in more than one instructional setting.

- Like most other students with and without disabilities, the most common type of instructional grouping for teaching language arts to students with hearing impairments is whole-class instruction. More than 59% of students across classroom settings receive whole-class instruction frequently, a figure comparable to that for students across all types of disabilities (64%). Readers should note that whole-class instruction for students with hearing impairments in self-contained settings may be somewhat more homogeneous than that for their peers in integrated settings.
- Among students with hearing impairments, whole-class instruction is provided more commonly to students receiving language arts in integrated settings (71%) than to those receiving language arts instruction self-contained settings (59%).

- Teachers’ report that both small-group instruction and individual instruction with a teacher are more frequently used in self-contained (nearly 50%) as opposed to integrated settings (34%).

Accommodations and Supports

Accommodations made to the presentation, format and content of instruction, materials, and assessments are intended to help students with disabilities perform at their true ability level. These accommodations are increasingly a part of the educational programs of all students with disabilities, including those with hearing impairments. Some accommodations (e.g., interpreters) directly address the various communication modes of many students with hearing impairments and their method of participation in the educational process. However, students with hearing impairments also may receive a range of other accommodations and supports (Exhibit 10).

Exhibit 10
Teacher-Reported Accommodations and Supports by Language Arts Classroom Setting

| | Integrated Settings | Self-Contained Settings |
|-----------------------------------|------------------------|----------------------------|
| Percentage of students receiving: | | |
| Accommodations | | |
| More time taking tests | 58 | 71 |
| Modified tests | 24 | 43 |
| Alternative test/assessments | 15 | 44 |
| Slower-paced instruction | 38 | 68 |
| Shorter/different assignments | 30 | 44 |
| Physical adaptations | 55 | 48 |
| Supports | | |
| Reader/interpreter | 17 | 34 |
| Computer use | 5 | 5 |
| Computer software | 5 | 11 |
| Subsample— | 285 | 327 |

- A variety of accommodations and supports play a role in the language arts instruction for many students with hearing impairments. Most accommodations and supports are more commonly provided to students in self-contained than in integrated settings.
- In both types of instructional settings, well over half of students with hearing impairments receive more time in taking tests, making it the most common accommodation provided.
- In self-contained settings, more time in taking tests (71%) and slower-paced instruction (68%) rank as the most commonly provided accommodations. Over 40% of students are also provided modified tests, alternate tests, shorter or different assignments, or physical adaptations.

- By contrast, in integrated settings, more time taking tests and physical adaptations are the most commonly provided accommodations for students with hearing impairments. Each of the other accommodations is provided to between 15% and 30% of students.
- Interpreting services are provided to 34% of students with hearing loss in self-contained settings—twice the proportion receiving them in integrated settings.
- Despite the growth in the availability of computer software and hardware for students with disabilities, these technologies are used by comparatively small numbers of students with hearing impairments, regardless of instructional setting.

Performance and Progress in School

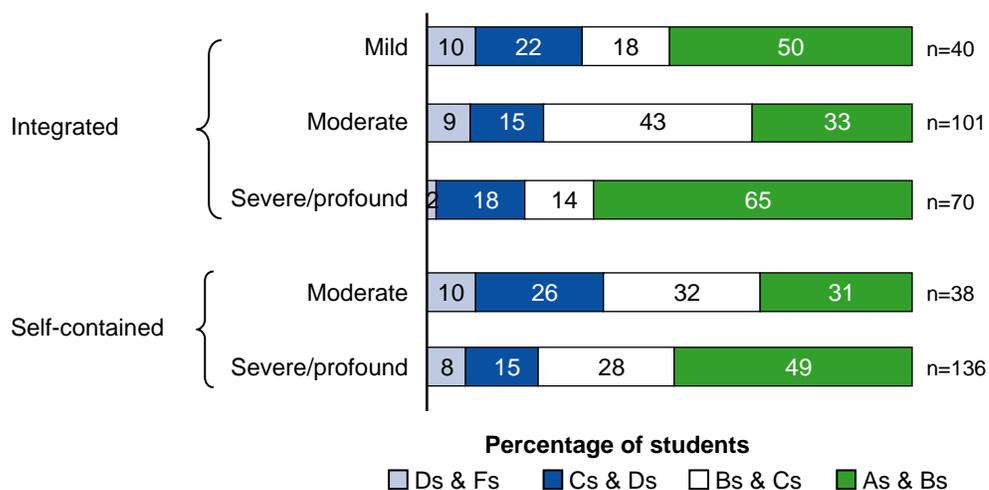
Grades

Teachers' evaluations of student performance, as indicated in course grades, represent a common metric that is tied to the day-to-day business of teaching and learning. Despite some technical limitations, grades serve a number of important functions, and they communicate to students and parents information about the students' mastery of course content.⁹ Exhibit 11 presents the grades received by students with mild, moderate, and severe/profound hearing loss in integrated settings as well as their peers with moderate or severe/profound hearing loss in self contained settings.

- For students with hearing impairments, reports of academic performance are mixed. Most students with hearing impairments appear to be performing well, with 33% (for moderate) to 65% (for severe/profound in integrated settings) earning grades of mostly As or Bs, and 14% (for severe/profound, integrated setting) to 43% (for moderate) earning mostly Bs and Cs.
- Still, 22% to 36% of students with hearing impairments have grades of mostly Cs and Ds or Ds and Fs. These grades are somewhat worse than those of same-age students in the general population.
- In both instructional settings, students with severe/profound hearing loss are more likely to receive As and Bs than are their counterparts with moderate hearing loss.

⁹ Parents were the primary source of information about grades. For students without parent interviews, information from the school questionnaire was used.

Exhibit 11
Grades, by Classroom Setting and Level of Hearing Loss

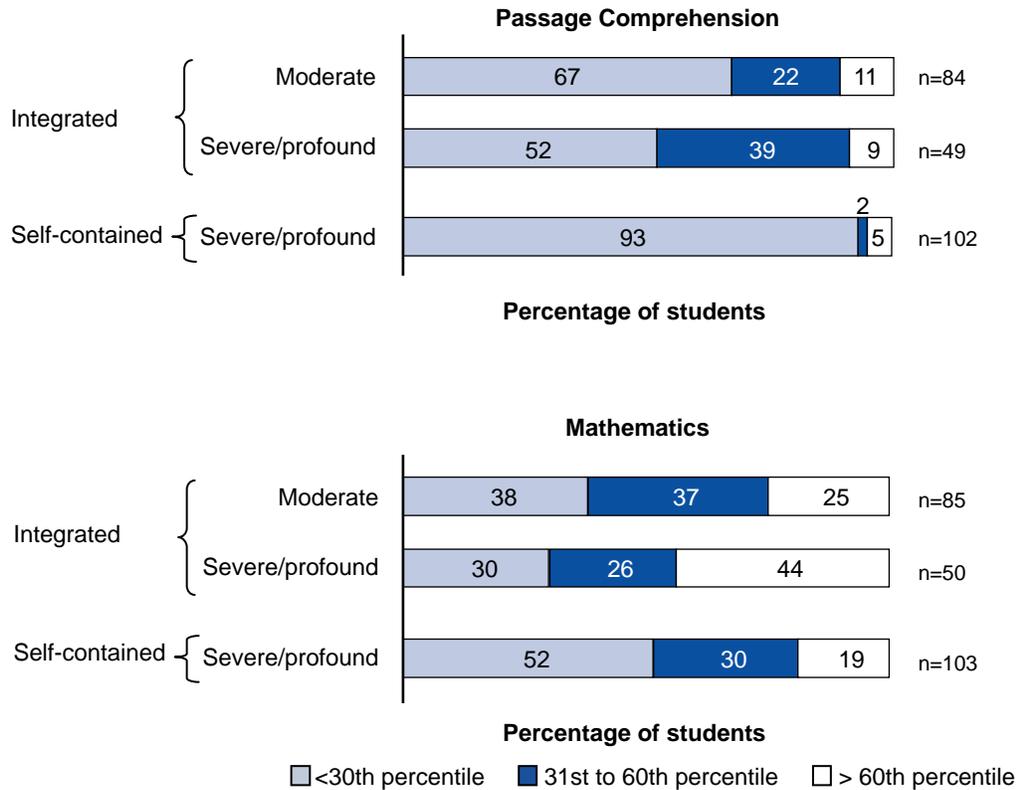


Standardized Test Scores

Research editions of the Woodcock-Johnson III (WJIII) test were used to conduct standardized assessments for reading and mathematics with SEELS students.¹⁰ WJIII is an individually administered test that allows comparison with the general population. The WJIII passage comprehension subtest (reading assessment) asks students to “fill in the missing word” to complete sentences with the correct meaning. The WJIII calculation subtest measures students’ computation skills, ranging in difficulty from elementary (e.g., simple addition) to advanced (e.g., integrating a function). Exhibit 12 presents, by classroom setting and level of hearing loss, the percentage of students with hearing impairments who obtained test scores within the identified ranges of percentile ranks in passage comprehension and mathematics calculation, respectively. The percentile metric represents the percentage of students in the general population who receive lower scores. The data provided in Exhibit 12 is divided into three sections: students who score in the lowest 30th percentile, students that score from the 31st to 60th percentile, and students that score above the 60th percentile.

¹⁰ Woodcock, R., McGrew, K., & Mather, N. (2001). Woodcock-Johnson III. Itasca, IL: Riverside Publishing.

Exhibit 12
WJIII Passage Comprehension and Mathematics Percentile Ranks,
by Classroom Setting and Level of Hearing Loss



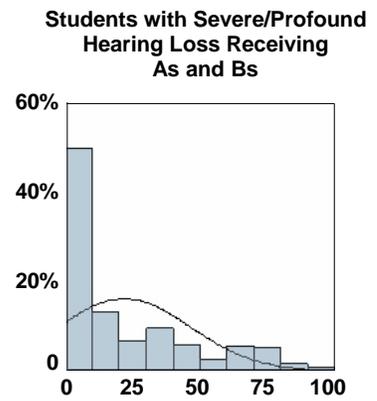
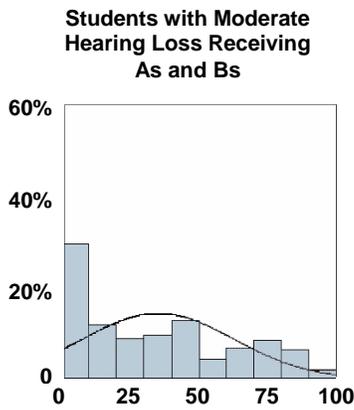
- Although students with hearing impairments achieve scores that span the percentile range, many students with hearing impairments, regardless of level of hearing loss, score low in passage comprehension when compared with the general population. Sixty-seven percent of students with moderate hearing loss in integrated settings have passage comprehension scores below the 30th percentile. For students with severe/profound hearing loss in integrated settings, 52% score in the lowest 30% of the range, whereas nearly all students with severe/profound hearing loss who are instructed in self-contained settings (93%) obtained low scores. These performances are comparable to those of students with learning disabilities—whose disability is associated primarily with difficulties in reading—76% of whom have passage comprehension scores below the 30th percentile.
- Results for WJIII mathematics calculation differ consistently from those for WJIII passage comprehension. Among the hearing loss categories, a noteworthy number of students (from 19% to 44%) score above the 60th percentile. Still, from 30% to 52% of students with hearing loss (depending upon degree of hearing loss) score below the 30th percentile. In integrated settings, forty-four percent of students with severe/profound hearing loss score above the 60th percentile, whereas only 25% of students with moderate hearing loss score the higher percentile. In self-contained settings, by

contrast, more than half of the students with severe/profound hearing loss score below the 30th percentile. Smaller proportions of students with moderate or severe/profound hearing loss in integrated settings scored at or below the 30th percentile.

Exhibit 13 examines students' percentile rankings for passage comprehension and mathematics for students with moderate and severe/profound hearing loss who receive good grades (As and Bs) from their teachers. The data provided in Exhibit 13 shows the distribution of student percentile ranking by level of hearing loss for students receiving good grades.

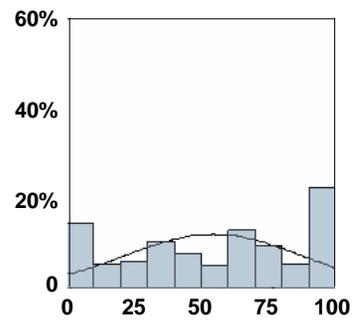
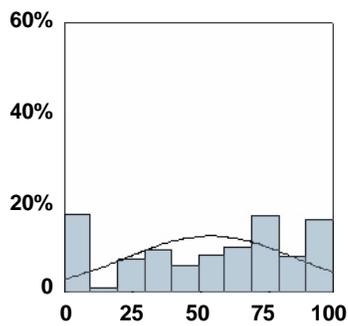
**Exhibit 13
WJIII Passage and Mathematics Percentile Ranks, by Grades Received**

Passage Comprehension



Percentile Ranking

Mathematics



Percentile Ranking

- Passage comprehension scores for students with hearing impairments who receive high grades are observed across the achievement spectrum. However, the distributions are disproportionate with many students scoring below the 10th percentile.

- Regardless of level of hearing loss, students who receive As and Bs tend to obtain lower scores in passage comprehension than they do in mathematics calculation. The scores for mathematics calculation are more evenly distributed across the percentile range for moderate and severe/profound hearing loss.
- Students with severe/profound hearing loss who also receive high grades achieve lower scores than their peers with moderate hearing loss in passage comprehension. For example, approximately fifty percent of students with severe/profound hearing loss score below the 10th percentile, whereas thirty percent of students with moderate hearing loss score that low. By contrast, the two groups of students have comparable scores in mathematics calculation. Approximately twenty percent of these students in both groups scored in the highest percentile category for mathematics calculation.
- The observed patterns of low scores mirror those from the Stanford Achievement Test for Deaf and Hard of Hearing Students.¹¹

Social and Cognitive Skills

Social and cognitive skills facilitate students' abilities to get along with others successfully and to learn academic content in school and beyond. The importance of these skills extends to all students, with and without disabilities and with and without hearing impairments. Unlike the communication skills described earlier, there is no direct relationship between hearing loss and either social or cognitive skills. These skills are extremely important for child functioning, but do not specifically relate to the degree of hearing loss. In essence, children with varying degrees of hearing loss are very similar in how parents reported social and cognitive skills. In SEELS, social skills are measured with the Social Skills Rating Scale (SSRS), which includes items that address elements of assertion, self-control, and cooperation, Gresham, & Elliott. (1990).¹² SEELS measures functional cognitive skills through parents' reports of their children's ability to tell time, count change, look up phone numbers, etc. (Exhibit 14).

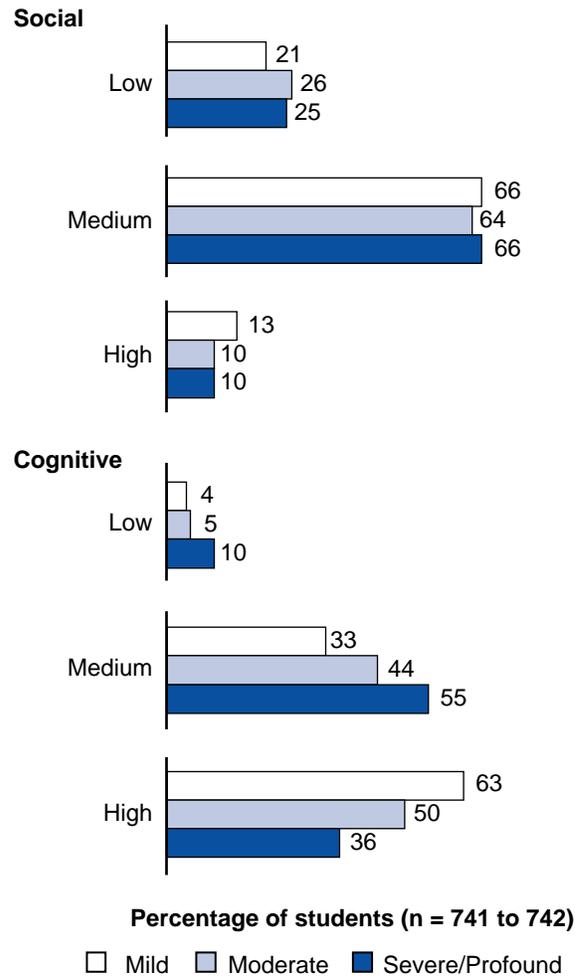
- Students with hearing impairments have social skills ratings that are similar to those for their hearing peers; they exhibit a range of social skills.
- Two-thirds of students, regardless of level of hearing loss, have social skill ratings that fall in the medium range. Considerably fewer have relatively low or high social skills ratings.
- Parents' reports of students' functional cognitive skills illustrate that students with hearing impairments perform across the functional range, but they are most frequently ranked in the medium or high category. However, students with hearing loss are more likely to have high cognitive skill than high social skill ratings.

¹¹ Author. (2003). Stanford achievement test norms booklet for deaf and hard of hearing students. San Antonio, TX: Harcourt Assessment Inc.

¹² Social Skills Rating System manual. Circle Pines, MN: American Guidance Service. "Low" scores are values that are lower than the mean for the general population by one standard deviation.

- Students with mild hearing loss are more likely to be reported as having high mental skills than peers with severe/profound loss.
- Social skills do not appear to be significantly related to level of hearing loss.

Exhibit 14
Parent-Reported Social and Cognitive Skills, by Level of Hearing Loss



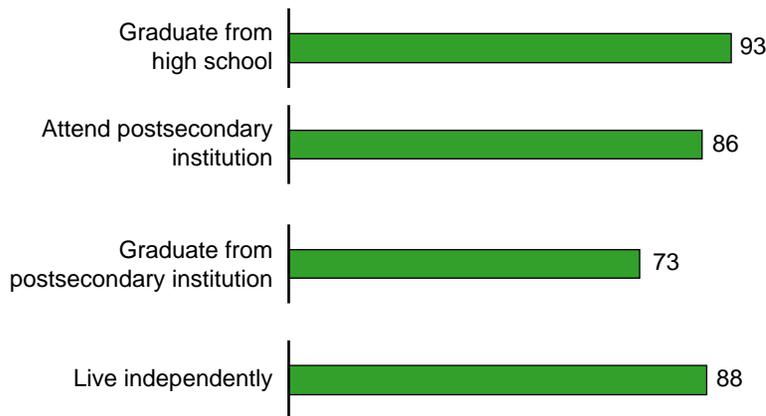
Parents' Expectations

Parents' expectations for students' success in life have frequently been linked to greater parental involvement in students' educational lives and often to later success. This relationship applies to all students, with and without disabilities. Exhibit 15 shows that parents of students with hearing impairments have generally high expectations for their children through high school and into young adulthood.

- Nearly all of the parents (93%) believe that their children with hearing impairments "probably" or "definitely" will graduate from high school. Somewhat smaller, but still large, majorities of parents indicated that their children "probably" or "definitely" will attend and graduate from postsecondary educational institutions and live independently in the

community. There is a significant relationship between parents who reported that their children will graduate from high school will also graduate from postsecondary educational institutions.

Exhibit 15
Parents' Expectations of Educational Attainment and Independence for Students with Hearing Impairments



Percentage of students "probably" or "definitely" will... (n = 720 to 732)

Summary

Students with hearing impairments who receive special education services are a diverse group; they vary in their level of hearing loss, family and demographic characteristics, school experiences, and outcomes. Most have medium or high social and mental skills, live in two-parent households, and have household incomes above the poverty level. Some spend their days in special schools, though most spend their school time in regular schools. Some receive small-group or individual instruction on a regular basis, but whole-group instruction is most common. Nearly all receive some type of accommodation or modification. Most have better-than-passing grades in school.

The level of hearing loss is an important issue for this population. Approximately half of students with hearing impairments have hearing loss described by their parents as “severe or profound.” These students have greater difficulty in communicating with others, are more likely to use signed communication, are more likely to attend special schools, and score lower on standardized tests of reading relative to their peers who have mild or moderate hearing losses. Among the three levels of hearing loss, students do not differ in their social and cognitive skills or their grades. However, these students who, in large part, have no identified cognitive impairment generally score quite low on standardized reading tests, regardless of degree of hearing loss. This pattern is particularly evident among students whose hearing loss is characterized as severe or profound: more than 80% of these students have test scores that fall within the

lowest 30% of the percentile range. The vast majority of these students score lower than students with mild or moderate hearing loss.

This special topic report underscores the diversity in characteristics, experiences, and outcomes for students who receive IDEA services for a hearing impairment. The analysis shows a population that mirrors or exceeds the general population or students with disabilities as a whole on several measures. It also illustrates that the communication challenges presented by hearing impairments are reflected in several outcome areas. And it highlights the challenge before us to develop high-quality, research based interventions to successfully overcome the instructional communication barrier and to help these students reach their academic potential, particularly in the content area of reading.

APPENDIX A
Sample Sizes (Ns) and Standard Errors (SEs)

| Exhibit 1 Parent-Reported Level of Hearing Loss | | |
|--|-----|------|
| | N | SE |
| Mild | 707 | 2.23 |
| Moderate | 707 | 2.88 |
| Severe/Profound | 707 | 2.94 |

| Exhibit 2 Parent-Reported Secondary Disability among Students Classified with Hearing Impairments as Primary Disability | | |
|--|-----|-----|
| | N | SE |
| Learning disabilities | 751 | 1.8 |
| Speech impairments | 751 | 2.4 |
| Mental retardation | 751 | .8 |
| Emotional disturbance | 751 | .8 |
| Visual impairments | 751 | .7 |
| Orthopedic impairments | 751 | 1.0 |
| Other health impairments | 751 | 2.3 |
| AD/HD | 751 | 2.2 |
| Autism | 751 | .6 |
| Traumatic brain injury | 751 | .3 |
| Deaf-blindness | 751 | .8 |
| Developmental delay | 751 | 1.0 |
| Other | 751 | 1.8 |

| Exhibit 3 Selected Demographic Characteristics of Students with Hearing Impairments | | |
|--|-----|------|
| | N | SE |
| Gender | | |
| Male | 751 | 2.90 |
| Ethnicity/Race | | |
| White | 751 | 2.80 |
| African American | 751 | 1.90 |
| Hispanic | 751 | 2.20 |
| Socioeconomics | | |
| Two-parent household | 726 | 2.48 |
| Income \$25,000 or less | 741 | 2.70 |
| Income more than \$50,000 | 741 | 2.80 |
| Household below poverty | 650 | 2.41 |

| Exhibit 4 | | |
|---|-----|------|
| Parent-Reported Communication Functioning, | | |
| by Level of Hearing Loss | | |
| (Percentage of students rate “as well as same-age peers” | | |
| | N | SE |
| Speaks clearly | | |
| Mild | 604 | 7.19 |
| Moderate | 604 | 5.26 |
| Severe/Profound | 604 | 4.03 |
| Communicates by any means | | |
| Mild | 725 | 6.66 |
| Moderate | 725 | 5.15 |
| Severe/Profound | 725 | 3.81 |
| Understands others | | |
| Mild | 744 | 7.10 |
| Moderate | 744 | 4.36 |
| Severe/Profound | 744 | 3.14 |

| Exhibit 5 | | |
|--|-----|------|
| Parent-Reported Communication Modes, by Level of Hearing Loss | | |
| | N | SE |
| Oral speech | | |
| Mild | 702 | 2.20 |
| Moderate | 702 | 2.10 |
| Severe/Profound | 702 | 3.60 |
| Lip reading | | |
| Mild | 709 | 7.17 |
| Moderate | 709 | 5.19 |
| Severe/Profound | 709 | 3.37 |
| Signed communication | | |
| Mild | 722 | 5.13 |
| Moderate | 722 | 4.49 |
| Severe/Profound | 722 | 3.79 |
| Communication board | | |
| Mild | 714 | 4.57 |
| Moderate | 714 | 2.57 |
| Severe/Profound | 714 | 3.10 |

| Exhibit 6 | | |
|---|----------|-----------|
| Parent-Reported Schools Attended, by Level of Hearing Loss | | |
| | <u>N</u> | <u>SE</u> |
| Regular School | | |
| Mild | 745 | 2.95 |
| Moderate | 745 | 2.77 |
| Severe/Profound | 745 | 3.47 |
| Special School | | |
| Mild | 745 | 2.38 |
| Moderate | 745 | 1.80 |
| Severe/Profound | 745 | 3.33 |

| Exhibit 7 | | |
|---|----------|-----------|
| Teacher-Reported Educational Goals, by Level of Hearing Loss | | |
| Percentage of students: | <u>N</u> | <u>SE</u> |
| Improve overall academics | | |
| Mild | 341 | 11.67 |
| Moderate | 341 | 7.39 |
| Severe/Profound | 341 | 4.06 |
| Build social skills | | |
| Mild | 341 | 9.97 |
| Moderate | 341 | 6.32 |
| Severe/Profound | 341 | 5.53 |
| Improve behavior | | |
| Mild | 341 | 9.01 |
| Moderate | 341 | 5.98 |
| Severe/Profound | 341 | 5.14 |
| Improve speech/communication skills | | |
| Mild | 341 | 12.09 |
| Moderate | 341 | 8.51 |
| Severe/Profound | 341 | 5.40 |

| Exhibit 8 | | | | |
|--|---------------|-------|-------------|------|
| Teachers-Reported Instructional Settings for Language Arts and Mathematics Instruction in Regular Schools, by Level of Hearing Loss | | | | |
| Percentage of students | Language Arts | | Mathematics | |
| | N | SE | N | SE |
| General education | | | | |
| Mild | 374 | 9.78 | 374 | 9.02 |
| Moderate | 374 | 7.30 | 374 | 7.50 |
| Severe/Profound | 374 | 5.38 | 374 | 5.63 |
| Resource room | | | | |
| Mild | 374 | 10.19 | 374 | 8.60 |
| Moderate | 374 | 7.25 | 374 | 6.88 |
| Severe/Profound | 374 | 4.34 | 374 | 3.81 |
| Self-contained class | | | | |
| Mild | 374 | 9.27 | 374 | 6.67 |
| Moderate | 374 | 6.58 | 374 | 6.51 |
| Severe/Profound | 374 | 5.54 | 374 | 5.62 |

| Exhibit 9 | | | | |
|---|------------|-----|----------------|-----|
| Teacher-Reported Instructional Groupings, by Language Arts Classroom Setting | | | | |
| Percentage of students frequently receiving language arts via: | Integrated | | Self-Contained | |
| | N | SE | N | SE |
| Whole-class | 305 | 4.2 | 327 | 4.7 |
| Small-group instruction | 303 | 4.4 | 323 | 4.8 |
| Individual instruction with teacher | 304 | 4.4 | 327 | 4.7 |

| Exhibit 10 | | | | |
|--|------------|-----|----------------|-----|
| Teacher-Reported Accommodations and Supports by Language Arts Classroom Setting | | | | |
| Percentage of students receiving: | Integrated | | Self-Contained | |
| | N | SE | N | SE |
| Accommodation | | | | |
| More time taking tests | 285 | 4.8 | 327 | 4.3 |
| Modified tests | 285 | 4.1 | 327 | 4.7 |
| Alternative test/assessments | 285 | 3.4 | 327 | 4.7 |
| Slower-paced instruction | 285 | 4.7 | 327 | 4.4 |
| Shorter/different assignments | 285 | 4.4 | 327 | 4.7 |
| Physical adaptations | 285 | 4.8 | 327 | 4.7 |
| Supports | | | | |
| Reader/interpreter | 285 | 3.6 | 327 | 4.5 |
| Computer use | 285 | 2.0 | 327 | 2.1 |
| Computer software | 285 | 2.0 | 327 | 3.0 |

Exhibit 11
Grades, by Classroom Setting and Level of Hearing Loss

| Percentage of students receiving: | Integrated | | Self-Contained | |
|-----------------------------------|------------|------|----------------|------|
| | N | SE | N | SE |
| As & Bs | | | | |
| Mild | 40 | 12.4 | -- | -- |
| Moderate | 101 | 8.2 | 38 | 13.1 |
| Severe/profound | 70 | 9.1 | 136 | 6.8 |
| Bs & Cs | | | | |
| Mild | 40 | 9.6 | -- | -- |
| Moderate | 101 | 8.6 | 38 | 13.2 |
| Severe/profound | 70 | 6.6 | 136 | 6.1 |
| Cs & Ds | | | | |
| Mild | 40 | 10.2 | -- | -- |
| Moderate | 101 | 6.2 | 38 | 12.4 |
| Severe/profound | 70 | 7.3 | 136 | 4.9 |
| Ds & Fs | | | | |
| Mild | 40 | 7.4 | -- | -- |
| Moderate | 101 | 4.9 | 38 | 10.8 |
| Severe/profound | 70 | 3.1 | 136 | 3.7 |

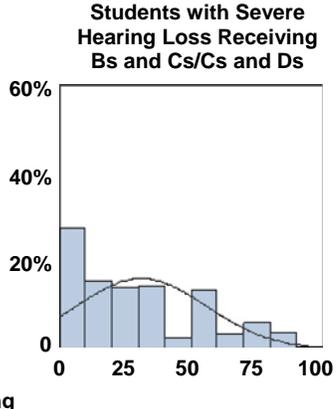
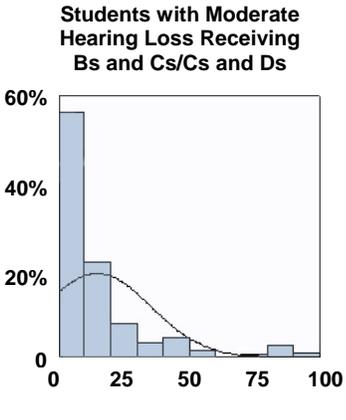
Exhibit 12
WJIII Reading and Mathematics Percentile Ranks,
by Classroom Setting and Level of Hearing Loss

| Percentage of students receiving: | Integrated | | Self-Contained | |
|--|------------|------|----------------|-----|
| | N | SE | N | SE |
| Reading: | | | | |
| <30 the percentile | | | | |
| Moderate | 84 | 9.1 | -- | -- |
| Severe/profound | 49 | 11.3 | 102 | 4.1 |
| 31st to 60th percentile | | | | |
| Moderate | 84 | 7.9 | -- | -- |
| Severe/profound | 49 | 11.1 | 102 | 2.1 |
| 60th percentile | | | | |
| Moderate | 84 | 6.1 | -- | -- |
| Severe/profound | 49 | 6.4 | 102 | 3.5 |
| Mathematics: | | | | |
| <30 the percentile | | | | |
| Moderate | 85 | 9.3 | -- | -- |
| Severe/profound | 50 | 10.2 | 103 | 8.1 |
| 31st to 60th percentile | | | | |
| Moderate | 85 | 9.2 | -- | -- |
| Severe/profound | 50 | 9.8 | 103 | 7.4 |
| 61th percentile< | | | | |
| Moderate | 85 | 8.3 | -- | -- |
| Severe/profound | 50 | 11.1 | 103 | 6.3 |

| Exhibit 13 WJIII Reading and Mathematics Percentile Ranks, by Grades Received | | |
|---|---------|-------------|
| | Reading | Mathematics |
| | N | N |
| As and Bs | | |
| Moderate | 62 | 64 |
| Severe/Profound | 101 | 104 |

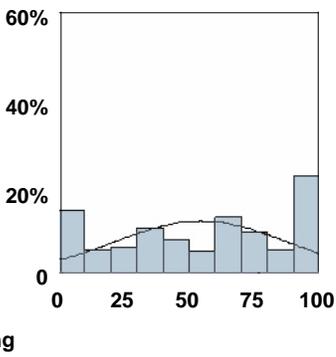
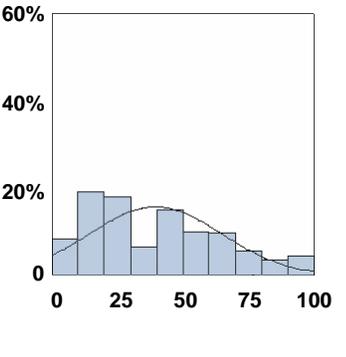
**Exhibit 13b (not included in the text of this report)
WJIII Reading and Math Percentile Ranks, by Grades Received**

Reading Comprehension



Percentile Ranking

Mathematics



Percentile Ranking

| Exhibit 13b | | |
|---|---------|-------------|
| WJIII Reading and Mathematics Percentile Ranks, by Grades Received | | |
| | Reading | Mathematics |
| | N | N |
| Bs and Cs/Cs and Ds | | |
| Moderate | 82 | 81 |
| Severe/Profound | 108 | 109 |

| Exhibit 14 | | | | | | |
|--|-----|------|--------|------|------|------|
| Parent-Reported Social and Cognitive Skills, by Level of Hearing Loss | | | | | | |
| | Low | | Medium | | High | |
| | N | SE | N | SE | N | SE |
| Social | | | | | | |
| Mild | 742 | 5.78 | 742 | 6.76 | 742 | 4.83 |
| Moderate | 742 | 4.58 | 742 | 5.01 | 742 | 3.15 |
| Severe/Profound | 742 | 3.52 | 742 | 3.88 | 742 | 2.41 |
| Cognitive | | | | | | |
| Mild | 741 | 2.62 | 741 | 6.72 | 741 | 6.88 |
| Moderate | 741 | 2.33 | 741 | 5.18 | 741 | 5.21 |
| Severe/Profound | 741 | 2.42 | 741 | 4.07 | 741 | 3.92 |

| Exhibit 15 | | |
|---|-----|------|
| Parents' Expectations of Educational Attainment and Independence for Students with Hearing Impairments | | |
| Percentage of students "probably" or "definitely" will: | N | SE |
| Graduate from high school | 732 | 1.48 |
| Attend postsecondary institution | 729 | 2.05 |
| Graduate from postsecondary institution | 720 | 2.62 |
| Live independently | 732 | 1.91 |