

Appelman, K. I., Callahan, J., O. Mayer, M. H., Luetke, B. S., & Stryker, D. S. (2012). Education, employment, and independent living of young adults who are deaf and hard of hearing. *American Annals of the Deaf*, 157(3), 264–275.

# EDUCATION, EMPLOYMENT, AND INDEPENDENT LIVING OF YOUNG ADULTS WHO ARE DEAF AND HARD OF HEARING

L

ITTLE INFORMATION is available on the education, employment, and independent living status of young deaf and hard of hearing adults who have transitioned from high school. The present article reports postsecondary outcomes of 46 young adults who had attended for at least 4 years a non-public agency school in the northwestern United States specializing in deaf education. School administrators had developed a specific philosophy and operationalized it in an academic and literacy-based curriculum incorporating a grammatically accurate signing system. The researchers found that most or all participants had finished high school, had earned a college degree, were employed, and were living independently. Findings are discussed in terms of the available literature and the study's contribution to a limited body of recent research on young postsecondary deaf and hard of hearing adults.

**KAREN I. APPELMAN, JUDY OTTREN CALLAHAN, MARGARET H. MAYER, BARBARA S. LUETKE, AND DEBORAH S. STRYKER**

THE FIRST FOUR AUTHORS ARE ALL AFFILIATED WITH THE NORTHWEST SCHOOL FOR HEARING-IMPAIRED CHILDREN, SEATTLE, WA. APPELMAN AND CALLAHAN ARE DIRECTORS AND FOUNDERS, MAYER IS COORDINATOR OF TEACHER EDUCATION AND RESEARCH, AND LUETKE IS OUTREACH AND LITERACY COORDINATOR. STRYKER IS AN ASSOCIATE PROFESSOR IN THE EDUCATION OF THE DEAF/HARD OF HEARING GRADUATE TEACHER PREPARATION PROGRAM, BLOOMSBURG UNIVERSITY OF PENNSYLVANIA.

**Keywords:** postsecondary education, academic achievement, deaf education, independent living, Signing Exact English

An extensive review of the current research literature on the education levels, employment status, and independence levels of deaf and hard of hearing who have completed high school revealed a paucity of information. Given the findings reported in studies of postsecondary youth with special needs in general (C. Johnson et al., 2011; D. Johnson, McGrew, Bloomberg, Bruininks, & Lin, 1997; Wagner et al., 2003; Wagner, Newman, Cameto, Garza, & Levine, 2005; Wagner, Newman, Cameto, & Levine, 2005,

2006; Wagner, Newman, Cameto, Levine, & Garza, 2006), as well as those concerning “the large and growing number of deaf and hard of hearing young adults who are ‘low-functioning’” (Bowe, 2003, p. 485), it would be unexpected that these youth would exit high school prepared for adult life. Youth who are deaf and hard of hearing and who are transitioning into adulthood today were born before newborn infant screening laws took effect in most states, and if they received cochlear implants or high-powered digital hearing aids, they did not have this equipment as infants and toddlers, at the most critical time for language and speech development. When they were young children the legal mini-



mum age for implantation was 3 years, and, because the surgical procedure was a new one, few parents agreed to have their child receive an implant.

As would be anticipated, students with all degrees of hearing loss continue to lag behind their same-age hearing peers in reading and mathematics when assessed by means of standardized measures applied to high school graduates of two residential schools in the southeastern United States, as reported by Lollis and LaSasso (2008). These researchers characterized this situation as having been a "consistent finding" for the past 90 years (p. 77). Students who are deaf and hard of hearing have been found to graduate from high school with sixth-grade computation abilities and fifth-grade problem-solving abilities (Traxler, 2000); this finding is based on the national norming data and performance standards for the Stanford Achievement Test (ninth edition) as derived from a population of students with a hearing loss distribution of 51% profound, 21% severe, and 28% less than severe. Deaf students' math levels lag behind those of hearing peers by about 3 years (Nunes, 2004) when deaf students are in college, even though they display normal nonverbal intelligence (see literature review by Vernon, 2005). The degree of hearing loss of the participants who were deaf and hard of hearing in the study by Nunes (2004) was not specified. Kelly (2003) contended that the math ability of individuals who are deaf and hard of hearing influences future employment and earnings to a greater extent than reading ability.

It seems logical that low levels of both reading and math ability prevent students who are deaf and hard of hearing from finishing high school and earning a high school diploma, as the majority of their hearing peers do. This impression is supported by Bowe

(2003), who found that about 30% of students age 17 years or older who were deaf and hard of hearing (degree of hearing loss undefined) completed high school, but that only about 22% received a high school diploma. About a fourth were labeled "low-functioning deaf" (p. 485), defined as reading at less than a second-grade level and achieving in math and other subjects at a second-grade to fourth-grade level. Bowe claimed that so much attention was being given to passing state tests (a development also considered by Lollis and LaSasso, 2008) that many students who were deaf and hard of hearing were possibly being deprived of the opportunity "to learn what they urgently need to learn . . . includ[ing] the skills of self-care and of self-determination, in addition to vocational and independent-living skills and competencies" (p. 487). Bowe lamented that these competencies are seldom taught in integrated or mainstreamed settings, where approximately 60% of students who are deaf and hard of hearing are now educated (Gallaudet Research Institute, 2008). Bowe listed specific skills that need to be taught to students who are deaf and hard of hearing before high school graduation if they are to live independently. Included on his list were social skills, the skills needed to obtain a driver's license, appropriate communication abilities, and the ability to set realistic goals; he added that "self-advocacy training is another area important in transition" (pp. 490–491).

Although some students who are deaf and hard of hearing are accepted into postsecondary programs, Lang (2002) found that only about 25% graduate (degree of hearing loss undefined). This graduation rate is about the same for both 2-year and 4-year programs. Lang's finding is supported by Stinson and Walter

(1992), as well as by Bowe (2003), who found that 70% of students who were deaf and hard of hearing dropped out while attending either a 2-year or 4-year college. Bowe suggested that this may be because their ability to read was just too low. Lang observed that "even with the expansion of support and access services provided in higher education programs over the past decade, the failure rate remains, on average, dismal" (p. 268).

### **Definition of Success When Postsecondary Youth Have a Disability**

The definition of success when students with special needs are transitioning from high school to adulthood was formulated in the wake of a national study by the National Center on Secondary Education and Transition (2004). Research staff at the NCSET defined success as the ability to demonstrate self-advocacy, make decisions, and express preferences. In addition, NCSET researchers recommended that school administrators "ensure students have access to the general education curriculum" (p. 7), "increase the school completion rates" (p. 8), "make school graduation decisions based on meaningful indicators of students' learning and skills" (p. 9), "ensure students access to and full participation in postsecondary education and employment" (p. 10), "increase informed parent participation and involvement in educational planning" (p. 12), "improve collaboration and systems linkages [with educationally relevant groups] at all levels" (p. 14), and "ensure the availability of a qualified workforce" (p. 15). The NCSET authors stated that these challenges have important implications for special education, general education, community agencies, and organizations as students



with disabilities transition from high school to postsecondary education, employment, and other aspects of adult life. Because students who are deaf and hard of hearing are a subset of those in special education, the characteristics of success described by the NCSET researchers are relevant to the present study.

### **Definition of Success When Postsecondary Youth Are Deaf and Hard of Hearing**

What constitutes success in the transition from high school to adulthood when students are deaf and hard of hearing is defined in the literature reviewed by Convertino, Marschark, Sapere, Sarcher, and Zupan (2009). Aiming to determine predictors of academic performance in college, Convertino et al. found that English-language ability was "clearly the most important predictor" (p. 337) of high performance on a standardized college admission test (i.e., the ACT) by deaf and hard of hearing college students whose hearing loss ranged from mild to profound. Convertino et al. also reiterated the findings of Stinson and Walter (1992) with regard to motivation among students who are deaf and hard of hearing, stating that the influence of parental expectations, academic achievement, and self-esteem had to be considered important factors in successful transitions from high school to adulthood.

With regard to defining self-esteem, Weisel and Kamara (2005) reviewed the available research literature and found that college students who were deaf and hard of hearing had lower self-esteem and a lower level of well-being than their hearing peers. The researchers' own investigation substantiated this finding: Students with more education exhibited less fear of forming boundaries with parents and of reaching autonomy.

More education was linked to living independently. Because participants were adult members of a social organization for deaf adults whose hearing status "ranged from deafness to mild hearing loss" (p. 54), Weisel and Kamara suggested that a different picture might emerge for these young adults who were fully integrated socially with hearing peers. They stated that "this group deserves the attention of future research" (p. 58).

Stinson and Walter (1992) identified other factors that were characteristic of the individualization process during the maturation of young adults who were deaf and hard of hearing (degree of hearing loss not defined)—in this case, freshmen at the National Technical Institute for the Deaf. These factors were the development of social skills and the establishment of identity—attainments that might be necessary for the transition to postsecondary education and young adult life in general. In agreement with this finding, Lang (2002) said, "Social/personal factors play a critical role in the success of deaf students in higher education, as well as in subsequent success in the workforce" (p. 269). He called for further investigation of the "relationships between adjustment, identity, and academic success" (p. 270) when students are deaf and hard of hearing.

In a study that investigated attachment and individualization of young adults who were deaf and hard of hearing, Weisel and Kamara (2005) found little relevant research. Sinkkonen (1994), reporting a thorough review of the literature on the topic, failed to uncover studies directly investigating independent living among individuals who were deaf and hard of hearing. Sinkkonen inferred that most of these young adults were "dependent and immature" (p. 53).

Acquisition of a Social Security ben-

efit (i.e., Supplemental Security Income, or SSI), a form of federal financial assistance, by young adults who were "hearing impaired [as defined or] designated by the youth's school or district" (Wagner, Newman, Cameto, & Levine, 2005, p. B-3) was reported for almost 23% of the participants in a national study of people with hearing loss ages 16–18 years (Newman, Wagner, Cameto, & Knokey, 2009). Nonacceptance of such aid might be another way to measure independence and maturity (Bowe, 2003), as it could be an indicator of employment status. Bowe (2003), who reported on deaf and hard of hearing individuals age 17 years or older, clarified that when an adolescent turns 18, the Social Security Administration considers that individual to be a "family of one" "if he or she is deaf or hard of hearing, meaning that they can qualify for financial assistance on the basis of their own earned income and personal assets" (p. 491). Thus, an 18-year-old who was not eligible for SSI in past years because the family income was too high would be eligible upon graduation from high school. Employed young adults who did not receive an SSI benefit or another form of federal financial assistance would seemingly be more independent and less dependent on their parents than those who did.

In the defining of a successful transition from high school to adult life, employment would seemingly be a factor to consider, yet it was difficult to find information on the number of young adults who are deaf and hard of hearing and employed (degree of hearing loss undefined). When vocational rehabilitation (VR) counselors were surveyed by Houston, Lammers, and Svorny (2010) in 2006 regarding the perceived effects of the Americans With Disabilities Act of 1990, the survey respondents offered no specific



data as to the percentage of young deaf adults who were employed. No other pertinent research could be found on this topic. Houston et al. did find that VR counselors felt that there were more employment options in the labor market for individuals with a hearing loss than in the past, "with the exception of workers who lacked postsecondary education" (p. 19). The researchers also found that many VR respondents "thought that lower wages and more generous 'SSI benefits' encouraged workers who are [deaf and hard of hearing] . . . without a postsecondary education to leave the labor market and rely [on federal financial assistance] (pp. 19–20). Houston et al. felt that their findings only "opened the door" (p. 20) to future research on employment when young adults are deaf and hard of hearing.

Accepting the responsibility to vote might be included in a definition of maturity. Schur, Shields, Kruse, and Schriener (2002) analyzed data on individuals with disabilities and voter turnout and reported turnout to be 20% lower among people with disabilities than those without them in a sample of "adult citizens," 17.4% of whom had a severe hearing loss (p. 173) and 2.4% of whom were deaf (p. 175). Lower voter turnout was found in general to occur among people who were unemployed. The researchers called for studies on the causal relationships among age, employment, and efficacy as they relate to voter turnout.

In 2001, the U.S. Department of Education, in response to the paucity of information on postsecondary-age citizens with special needs, funded a 10-year study, the NLTS2 (for second National Longitudinal Transition Study). Descriptive findings and multivariate analyses of multiple measures of academic performance were

compared to those from the first NLTS, which had been conducted in the mid-1980s. Like the original study, NLTS2 included the postsecondary outcomes of a nationally representative sample of youth in 12 categories of disability that was constructed to represent the entire population of students with disabilities in the United States. It included young adults who were deaf and hard of hearing and 16 to 18 years old when sampling began. Wagner and colleagues collected data beginning in 2001 (Wagner, Newman, Cameto, Garza, & Levine, 2005; Wagner, Newman, Cameto, & Levine, 2005, 2006; Wagner, Newman, Cameto, Levine, & Garza, 2006), and continued sampling every 2 years until 2009 (Newman et al., 2009). The researchers used a questionnaire that was completed by either the youths themselves or their parents (or guardians). Answers to survey questions were subjected to a complex series of weightings so that they would proportionately represent the various disability categories in the nation (Wagner, Newman, Cameto, & Levine, 2006). A detailed description of the NLTS2, including the national sampling, data collection, and analysis procedures, is provided by Wagner Newman, Cameto, and Levine (2006). Pertinent results of the NLTS2 national study, the most recent reported by Newman et al. (2009), are as follows. Participants who were deaf and hard of hearing ( $n = 510$ ) were between the ages of 21 and 24 years ( $M = 23.5$  years). Of those, a little more than 51% were male. About 10% were married. In regard to unaided hearing acuity, 65% of the sample was reported to have profound hearing loss, 28% moderate loss, and 7% mild loss. In this nationally representative sample of young adults who were deaf and hard of hearing, the high school graduation rate was 93.1%; the rate of

postsecondary academic program enrollment and attendance was 66.5%. Receipt of a certificate or degree from a postsecondary institution was reported for 29.7%. About 63% of the participants said they were employed, and averaged almost 34 hours of work per week. Use of the services of a care manager or service coordinator was indicated by about 61% of the sample; SSI was received by 22.9%. Most of the young adults, 58.4%, were living at home. A permit to drive or a driver's license was held by 79.0%, and 62.7% were registered to vote.

Data on grade-level reading and math abilities were also available from the NLTS2 national study, based on averaged responses as reported by Newman et al. (2009). Discussing these findings in order from above average to 4.9 grade levels behind the average, Newman et al. reported that about 19% of the participants were above to less than 1.0 grade level behind in reading and that almost 22% were functioning at this same level for math; 13% were 1.0 to 2.9 grade levels behind the average in reading and almost 18% behind to this degree in math; about 35%, the largest percentage, were 3.0 to 4.9 grade levels behind in reading, and almost 38% were behind to this degree in math. About 33% were 5.0 or more grade levels behind in reading, and almost 23% were this far behind in math. Older youth were significantly farther behind than younger participants; males were farther behind than females; non-White racial/ethnic groups were farther behind than those who were White; and students using a language at home other than English were farther behind than those from English-speaking homes.

C. Johnson et al. (2011) conducted a statewide study regarding young adults with one of 13 special needs who had exited high school and lived



in the state of Washington. One group of young adults was deaf and hard of hearing. Potential participants had been identified from a list of students with disabilities enrolled in state high schools who had received special education services. Participants or their parents responded to questions asked in telephone interviews by district staff. Data were analyzed by the Center for Change in Transition Services a year after the students had exited high school. Between 73% and 79% of all young adults in the state who possibly were deaf and hard of hearing, or their parents, were interviewed from 2000 to 2008. C. Johnson et al. did not report demographic information on age, degree of hearing loss, parent involvement, or socioeconomic status of their participants who were deaf and hard of hearing. The authors presented information by percentages in table form according to various comparisons (e.g., Percent of High School Graduates in College by Disability). Three questions were relevant to the present study: (a) Did you graduate from high school? (b) Have you attended vocational training, 2-year community college, or college/university? (c) Are you employed? For the last question, state respondents were asked once a year if they had been employed during the last 6 months. It was found that 76% had graduated from high school, 55% had attended training or college after high school, and 39% had been employed for some period within the year of the interview.

Having reviewed the current research as to the factors that indicate a successful transition from high school to adulthood by young adults with hearing loss, previous researchers had concluded that additional investigations of the education, employment, and personal achievement of young adults who were deaf and hard of

hearing would be a desired contribution to the empirical literature in the field of deaf education. Consequently, the purpose of the present study was to report specific postsecondary outcomes regarding a sample of this population who had completed at least 4 years in a particular program for students who are deaf and hard of hearing located in the northwestern United States (referred to in the present article as the "NW School").

### The NW School

Thirty years ago, a school for students with hearing loss was founded in the northwestern United States based on a specific philosophy and curriculum (Lowenbraun, Appelman, & Callahan, 1980), with the goal of grade-level achievement by students who are deaf and hard of hearing. The school is not private; instead, special education directors in 20 neighboring school districts, located in six counties, contract with the program to serve children whom they do not have staff or program to educate in their own district. As a nonpublic agency, the NW School (as we call it here) must adhere to all the rules and regulations of a public school and serves a diverse student body. Approximately 60 students were enrolled during the period germane to the present study.

The guiding tenets of the NW School have remained constant for three decades. The curriculum includes the use of Signing Exact English (SEE), a grammatically correct form of English (Gustason, Pfetzing, & Zawolkow, 1972; Gustason & Zawolkow, 1993), signed and paired with spoken English and used by all adults and students at all times. The dictionary of SEE (Gustason et al., 1972; Gustason & Zawolkow, 1993) is visible and used as a daily reference in all classrooms; each student is required to own a copy, which resides in his or her

desk. All staff's receptive and expressive SEE skills are evaluated regularly through observations with feedback (Mayer & Lowenbraun, 1990), and many have passed the evaluations for certification provided by Modern Signs Press in its regional workshops, at least one of which is held annually near the NW School. There are regularly scheduled staff discussions about the signing of vocabulary that does not appear in the SEE reference dictionary (Gustason & Zawolkow, 1993), and staff practice sign lessons (Gustason, 1983a, 1983b) almost weekly as part of staff meetings. If a student signs a comment or question that is ungrammatical, teachers often will state it in a correct or typical form and ask the child to say and sign it again. This strategy is referred to at the school as the "Again Technique" (Lowenbraun et al., 1980). If any staff member observes a fellow staff member using an ungrammatical comment or question, the latter will be informed and shown the grammatically correct way to say and sign the comment or question. Almost daily, each student receives 15 minutes of individualized tutoring in speech, listening, vocabulary, sentence patterns, and social sentences. Students are educated in small groups by grade level for academic and literacy training. Administrators use modeling and direct instruction to teach staff to give students choices, to model and encourage decision making, and to provide consequences for the choices that are made.

Most NW School students are mainstreamed into regular schools beginning in kindergarten and continuing through eighth grade, as appropriate and in compliance with individualized education program goals. On average, all kindergarteners and first graders are mainstreamed in at least one class at a local school.



Children in third through sixth grade are almost all mainstreamed for at least one academic class, and about 10% of the students are mainstreamed in two classes. By eighth grade, nearly 75% of the students are mainstreamed for three classes, or about half their school day.

Graduation from high school is expected and pursuit of a college degree encouraged by the administration and teachers at the NW School. Parents, grandparents, and others important to the well-being of each student are invited to many school functions and encouraged to participate in individual and group activities (e.g., curriculum night, alumni panels, parent informational sessions, sessions with successful deaf adults who work in the area). It is the specific assignment of one of the administrators to attend and collaborate in meetings with agencies and groups dealing with deaf education in the region and state. Teachers and assistant teachers are monitored monthly to ensure that the school philosophy and teaching strategies are employed. Teacher and assistant teacher training on topics related to literacy occurs almost monthly in 1-hour sessions. Age-appropriate English-language and reading abilities of the majority of students enrolled at the NW School for at least 4 years have been documented over the last decade (Luetke-Stahlman & Nielsen, 2004; Nielsen, Luetke, & Stryker, 2011; Stryker, Luetke, Nielsen & McLean, 2011).

The philosophy of the NW School also includes the promotion of self-determination and self-advocacy, access to general education curriculum, completion of grade-level curriculum, graduation requirements based on meaningful indicators of students' learning and skills, access to and full participation in secondary education, the sharing of information with par-

ents and parents' involvement in the educational planning for their child, collaboration with other relevant professional groups, and appropriately trained educators. These eight philosophical components are in alignment with the nationally recognized NCSET components. Informally collected information from or about graduates over the years indicated that many had successfully transitioned from high school to adulthood. However, prior to the present study, no empirical investigation had been conducted regarding these young adults.

Four research questions were addressed:

- What were the reading and math abilities of the participants while at the NW School?
- What level of education did they achieve?
- What is their employment status?
- Are they living independently?

### Method

A survey for the present study was developed from the survey used in the NLTS2 national sample. It asked former students of the NW School to respond to questions related to their education, employment, and independent living status.

### Participants

Former students of the NW School were identified as potential participants in the present study. Participants qualified if they were old enough to have graduated from high school and had attended the NW School for a minimum of 4 years between 1982 and 2003. Sixty-six potential participants were identified, and were contacted by e-mail. Responses were obtained from 46 individuals (70%). Of these participants, 93% were Caucasian and 7% were from

homes where English was not the first language. Participants were between 17 and 35 years old; the mean age was about 26 years. The participants were 46% male ( $n = 21$ ) and 54% female ( $n = 25$ ). About 22% were married. Sixty-three percent reported an unaided severe to profound hearing loss, 28% a moderate hearing loss, and 9% a mild hearing loss. About 20% had cochlear implants. Participants were not asked about their aided loss. Because the NW School is a nonpublic agency, tuition is charged. However, the full tuition of 95% of the participants had been paid by their school districts. The families of 5% of the participants had paid partial tuition.

### Instrument

A 15-item self-report online survey, based on the NLTS2 study, was used for the present study. The instrument included objective questions used in the NLTS2 study that could be answered affirmatively, negatively, or with a one-word answer, such as "Do you receive financial aid?" Questions asked on the survey are listed in Appendix A. No reliability or validity statistical analyses were performed beyond those done by the NLTS2 during development of the original survey (Wagner et al., 2003).

The survey was uploaded to SurveyMonkey ([www.surveymonkey.com](http://www.surveymonkey.com)), an Internet-based service for presenting surveys, collecting responses, and analyzing results. It was introduced via a personal e-mail from the directors of the NW School (found in Appendix B) and sent electronically to the 66 potential participants. The e-mail briefly explained the purpose of the research, indicated that answers would be kept confidential, and invited participation. Five weeks after the initial e-mail went out, a second e-mail was sent to those who had not responded. The potential participants were given 6 months to re-



spond to the survey before data collection was terminated.

### Procedure

Two types of data were collected for the present study. Through the use of the results of standardized achievement tests and curriculum-based tests obtained from the participants' cumulative files, reading and math abilities were averaged across the sample; this process provided "a framework for understanding the match or mismatch between expected performance and students' actual proficiency" (Blockorby, Chorost, Garza, & Guzman, 2009, p. 3). Grade-level reading and math abilities of the participants were obtained from school records collected by a third-party research consultant not employed by the NW School and are reported in Table 1, alongside the data from the national study.

The second type of data collected consisted of the responses to the survey described above. Responses were electronically submitted to the survey data bank maintained by SurveyMonkey. Survey responses for questions 2–15 were obtained from 46 participants (70%). Quantitative data were analyzed with the Statistical Package for the Social Sciences, version 16.0, with averaged percentages reported for nominal data.

### Results

A large majority of the participants—about three quarters—were above to less than a grade level behind in reading achievement; the same was true for math achievement. No participants were five or more grade levels behind in reading or math. The reading and math achievement discrepancy between tested and actual grade levels of the NW participants are shown in Table 1, as are data from the participants in the NLTS2 national survey.

As Table 2 shows, all of the partici-

**Table 1**

Comparison of Achievement Between Tested and Actual Grade Levels in Reading and Math for NW School Sample and NLTS2 National Sample

Grade level	Reading		Math	
	NW %	NLTS2 %	NW %	NLTS2 %
Above to less than 1.0 level behind	73.9	19.4	78.2	21.7
1.0–2.9 grade levels behind	23.9	13.1	19.6	17.6
3.0–4.9 grade levels behind	2.2	34.9	2.2	37.8
5.0 or more grade levels behind	0.0	32.6	0.0	22.9

*Note.* NLTS2, National Longitudinal Transition Study–2.

pants had earned a high school diploma. Large majorities had gone on to postsecondary education, earning degrees or certificates in most cases. Education outcomes are reported in Table 2 along with data from the NLTS2 national survey as well as the Washington state survey (C. Johnson et al., 2011).

Most of the participants reported being employed; on average, employed participants were working at about the full-time level. Outcome data regarding employment of the NW School participants are reported in Table 3 along with the data on participants in the NLTS2 national survey as well as the Washington state survey (C. Johnson et al., 2011).

Successful transitions to independent living were indicated by the large proportions of participants who had a driver's license or permit and who had registered to vote: about 9 out of 10 in both cases. Postsecondary independent living outcomes are shown in Table 4, along with the data reported in the NLTS2 national study.

### Discussion, Limitations of the Study, and Suggestions for Future Research

The present study contributes empirical information to the existing body of literature regarding the education, employment, and independent living of high school graduates who are deaf and hard of hearing. Asking individu-

**Table 2**

Postsecondary Outcome Data From NW School, National NLTS2, and Washington State Surveys: Education

Achievement indicator	NW School %	NLTS2 %	WA %
Graduate from high school	100.0	93.1	76.0
Attend postsecondary school	87.8	66.5	55.0
Receive degrees or certificates	66.7	29.7	NA

*Note.* NLTS2, National Longitudinal Transition Study–2.

**Table 3**

Postsecondary Outcome Data From NW School, National NLTS2, and Washington State Surveys: Employment

Achievement indicator	NW School %	NLTS2 %	WA %
Employment for postsecondary students no longer in school	85.3	63.2	39.0
Average hours worked per week	38.1	33.8	NA

*Note.* NLTS2, National Longitudinal Transition Study–2.



**Table 4**  
Postsecondary Outcome Data From NW School and National NLTSS Surveys:  
Independent Living

<i>Achievement indicator</i>	<i>NW School %</i>	<i>NLTSS %</i>
Receive SSI	15.0	22.9
Have a case manager	13.3	61.0
Live with parents	22.2	58.4
Have a driver's license or permit	93.3	79.0
Am registered to vote	88.9	62.7
<i>Notes.</i> NLTSS, National Longitudinal Transition Study-2. SSI, Supplemental Security Income.		

als with hearing loss about their experiences after high school can generate information that informs educators and leads to educational improvements (Bowe, 2003). It is possible that information about the specific skills that need to be taught to students who are deaf and hard of hearing so that they can successfully transition into adulthood could similarly assist parents.

For a number of reasons discussed in the introductory section of the present article, many young adults with hearing loss are low functioning and unprepared for an independent adult life. Yet the majority of the participants in the present study were college educated, employed at about a full-time level, living independently of their parents, in possession of a driver's license or permit, and registered to vote.

While the information collected in the present study may be useful in identifying important characteristics of a school program that helps individuals who are deaf and hard of hearing transition successfully to adulthood, further study is needed. Inclusion in the study of data on the level of parent participation at school, the degree to which parents signed, and different cultural groups represented by the students would have strengthened the analysis. Because this type of information was not available regarding the participants in past

research, and specifically not in the studies conducted by Wagner and colleagues (Wagner, Newman, Cameto, Garza, & Levine, 2005; Wagner, Newman, Cameto, & Levine, 2005, 2006; Wagner, Newman, Cameto, Levine, & Garza, 2006), we did not collect these data in the present study, which paralleled Wagner and colleagues' research. Additionally, no data were collected regarding the use of assistive listening devices; nor was information on participants' aided hearing loss requested or reported. These variables warrant future investigation if researchers are to better understand why one group of students can make a seemingly successfully transition to adult life while others do not.

In 2003, Bowe reported that only about 22% of high school students classified as "hearing impaired" received a high school diploma. However, in 2011, C. Johnson et al. (2011) reported a graduation rate of 76% in a sample in one state, Washington. In research published in 2005 and 2006, Wagner and colleagues (Wagner, Newman, Cameto, Garza, & Levine, 2005; Wagner, Newman, Cameto, & Levine, 2005, 2006; Wagner, Newman, Cameto, Levine, & Garza, 2006) found that 93% of the individuals in their national sample had graduated from high school. The NW School alumni in the present study had a 100% graduation rate.

Lang (2002), as well as Stinson and

Walter (1992), found that while many students with hearing loss enroll in college programs in the United States, many do not finish their studies. Bowe (2003) also reported that only about 30% of students who are deaf and hard of hearing who enroll in college earn a degree. This finding was substantiated by Wagner and colleagues (Wagner, Newman, Cameto, Garza, & Levine, 2005; Wagner, Newman, Cameto, & Levine, 2005, 2006; Wagner, Newman, Cameto, Levine, & Garza, 2006). Almost 67% of the NW School sample had earned a college degree, a finding that possibly supports that of Convertino et al. (2009) that English-language ability is linked to academic success. English-language ability is "clearly the most important predictor" of high performance on college entrance measures when students are deaf and hard of hearing (Convertino et al., p. 337). Language data were not collected in the NLTSS national study or in the statewide survey done in Washington.

Luetke-Stahlman and Nielsen (2004), Nielsen et al. (2011), and Stryker et al. (2011) collected English-language data for the former NW School students who had been enrolled for at least 5 years. Seventy-four percent of these individuals who participated in the present study were above to less than one grade level behind in reading achievement, and about 78% functioned on this level in math. The importance of the NW School's linguistic environment, that is, the use of SEE, English-language strategies, and regular assessment, as well as daily tutoring in listening, speech, and English grammar, could be an important factor in enabling the English-language development necessary for academic success. Although linguistic environment was not studied specifically in the present study, it merits future research. The study participants



did not seem to be language deprived in the sense discussed by Vernon (2005) in regard to the general population of people with hearing loss; nonetheless, the relationship between English-language ability and education, employment, and independent living also merits future research.

The results of the present study indicate that not all persons who are deaf and hard of hearing can be characterized as "dependent and immature," as Sinkkonen (1994) reported and as Weisel and Kamara (2005) found. Wagner and colleagues (Wagner, Newman, Cameto, Garza, & Levine, 2005; Wagner, Newman, Cameto, & Levine, 2005, 2006; Wagner, Newman, Cameto, Levine, & Garza, 2006) found that more than half of those represented in their national sample lived with their parents, compared to only 22% of the NW School sample, and that almost 23% of the national sample collected SSI, compared to only 15% of the NW School sample. The results of the present study do not support the claim of inordinate dependency made by previous researchers, but indicate, rather, that individuals who are deaf and hard of hearing can be educated to become independent and mature young adults.

"More education" was found by Weisel and Kamara (2005, p. 58) to result in more autonomy and individualization. This finding is supported by the research of Convertino et al. (2009), but was not specifically addressed in the present study. Because a higher number of participants from the NW School were living independently, were registered to vote, and held a driver's license or permit, and since fewer received SSI, perhaps these positive independent living characteristics could qualify the NW School sample as more autonomous. The relationship between completion

of college and independent living variables warrants future research.

Some of the findings compiled in the review of the literature, as well as the results of the present study, serve as baseline information for future work. For example, it was difficult to find information on the number of young adults who are deaf and hard of hearing and employed (Houston et al., 2010). Wagner and colleagues (Wagner, Newman, Cameto, Garza, & Levine, 2005; Wagner, Newman, Cameto, & Levine, 2005, 2006; Wagner, Newman, Cameto, Levine, & Garza, 2006) found that 65% of those in their national sample were employed, and C. Johnson et al. (2011) reported that 39% of those in the Washington state survey worked. About 85% of the NW School participants were employed; on average, this segment worked almost full-time. More research is needed to clarify the relationship between education level and the types of employment individuals who are deaf and hard of hearing obtain. Schur et al. (2002) called for further research on the causal relationships among age, employment, and voter turnout.

The results of the present study add to the literature on the education, employment, and independence of young adults who are deaf and hard of hearing and who have transitioned out of high school and into young adult life. These results could aid educators and parents in identifying characteristics of a school program that result in more young adults graduating from high school and college, obtaining employment, and living independent lives. Although an independent life is difficult to describe, it should be noted that most of the participants in the present study had completed college, were married, worked, had a driver's license or permit, were registered to vote, and no longer lived with their parents.

## References

- Blockorby, J., Chorost, M., Garza, N., & Guzman, A. (2009). The academic performance of secondary school students with disabilities. In L. Newman, M. Wagner, R. Cameto, & A. Knokey (Eds.), *The post-high school outcomes of youth with disabilities up to four years after high school: A report from the National Longitudinal Transition Study-2 (NLTS-2)* (pp. 4-1-4-15). Menlo Park, CA: SRI International.
- Bowe, F. (2003). Transition for deaf and hard-of-hearing students: A blueprint for change. *Journal of Deaf Studies and Deaf Education*, 8(4), 485-493.
- Convertino, C., Marschark, M., Sapere, P., Sarcher, T., & Zupan, M. (2009). Predicting academic success among deaf college students. *Journal of Deaf Studies and Deaf Education*, 12(3), 324-343.
- Gallaudet Research Institute. (2008). *Regional and national summary report of data from the 2007-08 Annual Survey of Deaf and Hard of Hearing Children and Youth*. Washington, DC: Gallaudet University.
- Gustason, G. (1983a). *Student workbook: Beginning curricula A, B, and affixes used in Signing Exact English*. Los Alamitos, CA: Modern Signs Press.
- Gustason, G. (1983b). *Teaching and learning Signing Exact English: An idea book*. Los Alamitos, CA: Modern Signs Press.
- Gustason, G., Pfetzing, D., & Zawolkow, E. (1972). *Signing Exact English*. Los Alamitos, CA: Modern Signs Press.
- Gustason, G., & Zawolkow, E. (1993). *Signing Exact English*. Los Alamitos, CA: Modern Signs Press.
- Houston, K., Lammers, H., & Svoyny, S. (2010). Perceptions of the effect of public policy on employment opportunities for individuals who are deaf or hard of hearing. *Journal of Disability Policy Studies*, 21(1), 9-20.
- Johnson, C., Iwaszuk, J., Johnston, W., Ostergren, M., Smith-Henry, M., & Edgar, E. (2011). An analysis of state follow-up data on the postschool status of special education graduates. Seattle, WA: Center for Change in Transition Services.
- Johnson, D., McGrew, K., Bloomberg, L., Bruininks, R., & Lin, H. (1997). Results of a national follow-up study of young adults with severe disabilities. *Journal of Vocational Rehabilitation*, 8, 119-133.
- Kelly, L. (2003). *The development of the mental representation of number magnitude in children with hearing impairment* (Unpublished master's thesis). University of Aberdeen, Aberdeen, Scotland.
- Lang, H. (2002). Higher education for deaf students: Research priorities in the new millennium. *Journal of Deaf Studies and Deaf Education*, 7(4), 267-274.
- Lollis, J., & LaSasso, C. (2008). The appropriateness of the North Carolina state-mandated



- reading competency test for deaf students as a criterion for high school graduation. *Journal of Deaf Studies and Deaf Education*, 14(1), 76–98.
- Lowenbraun, S., Appelman, K., & Callahan, J. (1980). *Teaching the hearing-impaired through Total Communication*. Columbus, OH: Merrill.
- Luetke-Stahlman, B., & Nielsen, D. (2004). A study of the role of Signing Exact English and phonological awareness in reading achievement. In B. Luetke-Stahlman & D. C. Nielsen (Eds.), *Deaf students can be great readers*. (pp. 81–136). Los Alamitos, CA: Modern Signs Press.
- Mayer, P., & Lowenbraun, S. (1990). Total Communication usage among elementary teachers of hearing impaired subjects. *American Annals of the Deaf*, 135, 257–263.
- National Center on Secondary Education and Transition. (2004). *Current challenges facing the future of secondary education and transition services for youth with disabilities in the United States*. Retrieved from [www.ncset.org/publications/discussionpaper](http://www.ncset.org/publications/discussionpaper)
- Nielsen, D., Luetke, B., & Stryker, D. (2011). The importance of morphemic awareness to reading achievement and the potential of signing morphemes to supporting reading development. *Journal of Deaf Studies and Deaf Education*, 16(3), 275–288. doi:10.1093/deafed/enq063
- Newman, L., Wagner, M., Cameto, R., & Knokey, A. (2009). *The post-high school outcomes of youth with disabilities up to four years after high school: A report from the National Longitudinal Transition Study-2 (NLTS-2)*. Menlo Park, CA: SRI. Retrieved from National Center for Special Education Research website: [www.nlts2.org/reports/2009\\_04/nlts2\\_report\\_2009\\_04\\_complete.pdf](http://www.nlts2.org/reports/2009_04/nlts2_report_2009_04_complete.pdf)
- Nunes, T. (2004). *Teaching mathematics to deaf children*. London, England: Whurr.
- Schur, L., Shields, T., Kruse, D., & Schriener, K. (2002). Enabling democracy: Disability and voter turnout. *Political Research Quarterly*, 55(1), 167–190.
- Sinkkonen, J. (1994). *Hearing impairment, communication, and personality development* (Unpublished doctoral dissertation). University of Helsinki, Helsinki, Finland.
- Stinson, M., & Walter, G. (1992). Persistence in college. In S. G. Foster & G. G. Walter (Eds.), *Deaf students in postsecondary education* (pp. 43–64). New York, NY: Routledge.
- Stryker, D., Luetke, B., Nielsen, D., & McLean, M. (2011). *Results of standardized reading and English-language tests given in 2010 at a school for the deaf in the Northwest*. Manuscript in preparation.
- Traxler, C. (2000). The Stanford Achievement Test, ninth edition: National norming and performance standards for deaf and hard of hearing students. *Journal of Deaf Studies and Deaf Education*, 5(4), 337–348.
- Vernon, M. (2005). Fifty years of research on the intelligence of deaf and hard of hearing children: A review of literature and discussion of implications. *Journal of Deaf Studies and Deaf Education*, 10(3), 225–231.
- Wagner, M., Marder, C., Blockorby, J., Cameto, R., Newman, L., Levine, P., & Davies-Mercier, E. (2003). *The achievements of youth with disabilities during secondary school: A report from the National Longitudinal Transition Study-2 (NLTS-2)*. Menlo Park, CA: SRI International.
- Wagner, M., Newman, L., Cameto, R., Garza, N., & Levine, P. (2005). *After high school: A first look at the postschool experiences of youth with disabilities: A report from the National Longitudinal Transition Study-2 (NLTS-2)*. Menlo Park, CA: SRI International.
- Wagner, M., Newman, L., Cameto, R., & Levine, P. (2005). *Changes over time in the early postschool outcomes of youth with disabilities: A report of findings from the National Longitudinal Transition Study (NLTS) and the National Longitudinal Transition Study-2 (NLTS-2)*. Menlo Park, CA: SRI International.
- Wagner, M., Newman, L., Cameto, R., & Levine, P. (2006). *The academic achievement and functional performance of youth with disabilities: A report from the National Longitudinal Transition Study-2 (NLTS-2)*. Menlo Park, CA: SRI International.
- Wagner, M., Newman, L., Cameto, R., Levine, P., & Garza, N. (2006). *An overview of findings from Wave 2 of the National Longitudinal Transition Study-2 (NLTS2)*. Menlo Park, CA: SRI International.
- Weisel, A., & Kamara, A. (2005). Attachment and individualization of deaf/hard of hearing and hearing young adults. *Journal of Deaf Studies and Deaf Education*, 10(1), 51–60.



## Appendix A

### Self-Report Online Survey Questions

1. What is your name, address, and other contact information?
2. What is your age?
3. What is your gender?
4. What is your marital status?
5. How is your hearing loss defined on your audiogram?
6. Did you graduate from high school?
7. Have you attended a vocational school, 2-year community college, 4-year college/university, or other job training?
8. Have you attended graduate school?
9. Have you received any degrees or certificates?
10. Are you currently employed?
11. Do you have a case manager or service coordinator?
12. Do you receive financial aid?
13. Where do you live now?
14. Do you have a permit to drive or driver's license?
15. Are you registered to vote?



## Appendix B

### Introductory Letter for Online Survey

Dear NW School Graduate:

We are conducting a survey of graduates of the NW School. This survey will provide valuable information to us about the effectiveness of our school. Your answers will be kept private and confidential. We would greatly appreciate your help with this. Please select the following link to begin the survey:

[Link to survey](#)

Thank you so much for helping us with our survey.

Warmly,

(Names of directors were listed.)



Copyright of American Annals of the Deaf is the property of American Annals of the Deaf and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.