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How Ready are Postsecondary Institutions for Students who are d/Deaf or Hard-of-Hearing?

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Abstract: Educational policy in the United States is increasingly focused on the need for individuals to be academically ready for postsecondary education experiences. The focus of these initiatives, however, centers primarily on individuals and their competencies and characteristics, and not on the capacities of postsecondary institutions to serve them. This article uses the lens of students who are d/Deaf or hard-of-hearing (DHH) to explore ways in which college readiness can be conceptualized as overlapping continuums of preparedness for both individuals and institutions. The article first summarizes research on students who are DHH and their readiness across core domains of academic preparation, language and communication, and soft skills. The article then discusses considerations at the institutional level such as accommodations, direct vs. mediated communication, student disclosure rates, and their level of accessibility for students who have a different academic, linguistic, and cultural experience than most institutional infrastructure is designed to serve. We conclude with considerations for future investigation and an expansion of the dialog around readiness and postsecondary education.

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¿Cuan preparadas están las instituciones de educación superior para estudiantes sordos o con problemas de audición?

Resumen: La política educativa en los Estados Unidos se centra cada vez más en la necesidad de que los individuos esten académicamente preparados para experiencias de educación post-secundaria. El enfoque de estas iniciativas , sin embargo, se centra principalmente en las personas y sus competencias y características, y no en las capacidades de las instituciones de educación superior para servirles. Este artículo utiliza la lente de estudiantes que son sordos o con problemas de audición (DHH) para explorar las formas en que la preparación universitaria se puede conceptualizar como una continuación de preparación donde se superponen tanto los individuos como las instituciones. El artículo resume primero investigación sobre los estudiantes que son DHH y su disposición a través de dominios básicos de la preparación académica, el lenguaje y la comunicación, y habilidades sociales Luego, el artículo analiza las consideraciones a nivel institucional, tales como alojamiento , comunicación directa mediado mediada, las tasas de información sobre las capacidades de los estudiante, y su nivel de accesibilidad para los estudiantes que tienen una experiencia académica, lingüística y cultural diferente a la de la mayoría de los estudiantes a los cuales la infraestructura institucional está diseñada para servir. Se concluye con consideraciones para futuras investigaciones y una expansión sobre el debate en torno a la preparación y la educación post-secundaria.

Palabras clave: sordera; preparación universitaria; estudios superiores; transición.

Estão preparadas as instituições de ensino superior para os alunos surdos ou com deficiência auditiva ?

Resumo: A política educacional nos Estados Unidos estão cada vez mais focados na necessidade de os indivíduos sejam academicamente preparados para experimentar o ensino superior. O foco dessas iniciativas, no entanto, concentra-se principalmente sobre as pessoas e suas habilidades e características e não na qualidade das instituições de ensino superior para servir. Este artigo usa a lente dos alunos que são surdos ou com deficiência auditiva (DHH) para explorar as maneiras pelas quais a preparação para a faculdade pode ser conceituada como uma continuação da preparação em que ambos os indivíduos e as instituições se complementam. O artigo resume a pesquisa sobre os estudantes com DHH e a sua disposição nos domínios básicos de preparação acadêmica, linguagem e comunicação, habilidades sociais. Depois o artigo analisa as considerações de nível institucional, tais como alojamento , a comunicação direta o mediadas, taxas de informações sobre as capacidades dos alunos e o nível de acessibilidade para alunos que são diferentes da maioria dos alunos por suas experiências acadêmica, linguística e cultural para que a infra-estrutura institucional é preparada para servir. Concluímos com considerações para futuras pesquisas e uma expansão no debate sobre a preparação e educação pós-secundária.

Palavras-chave: surdez; preparação para a faculdade; ensino superior; transição

How Ready are Postsecondary Institutions for Students who are d/Deaf or Hard-of-Hearing?[1]

College enrollment and completion are two of the most important factors that determine an individual's earning power over the course of a lifetime. For example, males who completed a bachelor's degree were more likely to be employed and earn significantly more than those with only a high school diploma, with a median salary of $63,700 vs. $40,060 for the two groups, respectively (National Center on Education Statistics, 2011). Unfortunately, only half of students who enter a four-year institution will complete a bachelor's degree (Kuh, Kinzie, Schuh, & Whitt, 2010; National Center on Education Statistics, 2012). This retention issue is even more acute for individuals who are d/Deaf or hard of hearing (DHH). Studies by a range of authors from different contexts (including Bowe 2003; Lang 2002; Newman et al., 2011; Stinson & Walter, 1992; Wagner, Newman, Cameto, Garza, & Levine, 2005; Wagner, Newman, Cameto, Levine & Garza, 2006) indicate that recent postsecondary enrollment rates for individuals who are DHH are comparable to their peers and have grown significantly in the past two decades. However, only a small fraction of DHH individuals complete their postsecondary training, with estimates as low as 25-30% graduating with either a 2- or 4-year degree (Newman, et al., 2011). Challenges with persistence appear to be particularly salient after the first year (Boutin, 2008; Stinson, Scherer, & Walter, 1987). Furthermore, DHH individuals attend technical colleges, vocational schools, and community colleges at over twice the rate of the general population, with a smaller proportion enrolling in bachelor degree granting institutions than their peers (Newman, et al., 2011).

Readiness for postsecondary education has multiple meanings across contexts and is linked to concepts such as standards-based reform, accountability reforms, and opportunity to learn (Abernathy, 2007, Cross, 2004; National Commission on Excellence in Education, 1983; Stevens & Grymes, 1993; Tyack & Cuban, 1995). College and Career Readiness (CCR) standards, one current conceptualization around preparation for post-high school options, places the primary focus on an *individual's* readiness for postsecondary opportunities.[2] While there is a strong emphasis on academic preparation, both in terms of students' factual knowledge and problem-solving skills, the CCR standards point towards the broader range of skills that are needed to be successful in postsecondary settings, such as leadership and teamwork. All students, including those who are DHH, must have sufficient academic preparation, strong sense of self-efficacy, and understand how to negotiate the complex social environments that are workplaces and training settings (Benz, Yovanoff, & Doren, 1997; Luft, 2012; Michael, Most, & Cinamon, 2013; Morningstar et al., 2010; Wehmeyer & Schwartz, 1997). Readiness for postsecondary education is thus complex and part of a long developmental process from adolescence into adulthood.

These concepts of readiness and subsequent retention from postsecondary education focus primarily on the individual, yet the concept of postsecondary *institutional* readiness is also relevant to policy debates about standards, policies, and outcomes (Bailey, Calcagno, Jenkins, Kienzl, &

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[2] For the purposes of this article, College and Career Readiness refers to the content knowledge and skills high school graduates must possess in English and mathematics – including, but not limited to, reading, writing communications, teamwork, critical thinking and problem solving – to be successful in any and all future endeavors (America Diploma Project Network (nd)).

Leinbach, 2005; Lau, 2003). Are postsecondary institutions ready for the students who will transition from the K-12 experience? Is there a match between the skills and characteristics of the students leaving high school and the training and educational opportunities afforded to them?[3] These questions are even more pressing for students who have not traditionally experienced academic success in postsecondary settings, as have many students who are DHH. The extent to which institutions are prepared to serve enrolled students who are DHH will potentially have an effect on these students' retention, graduation, and future success.

Using the case of individuals who are DHH as a guiding example, we propose that the construct of readiness necessarily includes both *individual* and *institutional* factors. We conceptualize degrees of readiness for both students and institutions on separate continuums (Figure 1). Individuals with high readiness bear characteristics such as strong academic preparation, high self-efficacy, and sophisticated problem solving sills. Characteristics of institutions with high readiness for students with disabilities are less clear, but may include adequate advising, quality accommodations, and providing multiple learning formats that are accessible to students with a broad range of English literacy. There is also the possibility that the individual and institutional continuums overlap. For example, some institutions may be "low" on their level of readiness for a broad range of incoming students, focusing only on high achieving students, resulting in very little overlap between the continua for individual and institutional readiness. Other institutions may be well prepared for students with diverse characteristics, and so be "high" on their level of readiness and have large amount of overlap with their potential student body. Institutional readiness for students who are DHH is not an issue that only specialized institutions need to consider. In recent years, an increasing number of students who are DHH have elected to attend college with their hearing peers rather than institutions specifically intended for deaf students (Richardson, Marschark, Sarchet, & Sapere, 2010), making this issue of institutional readiness applicable to all postsecondary settings.

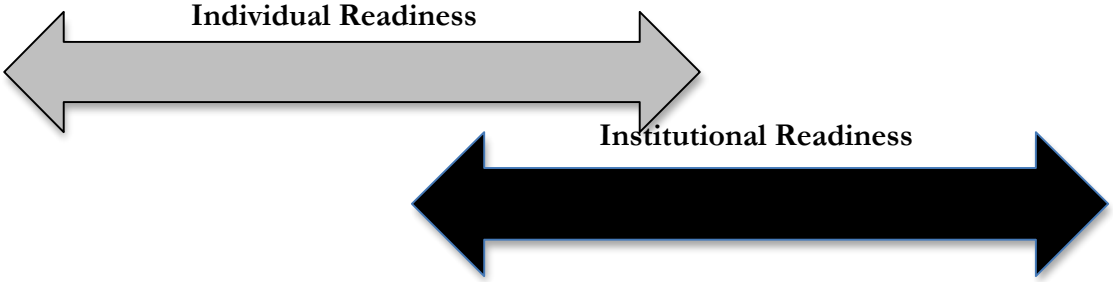

Figure 1. Overlapping Continuums of Individual and Institutional Readiness

In the remainder of this paper we first describe some of the key characteristics of students who are DHH (SDHH) and the broad range of individual readiness that they bring to postsecondary institutions. We then explore what features of readiness are necessary at the institutional level and ways that even an excellently prepared SDHH may face obstacles to obtaining a postsecondary degree. We conclude with implications for institutional readiness in the conceptualization of how SDHH reach their educational goals.

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[3] Although we focus here primarily on a single institution as a unit of analysis, for an individual moving from high school to a postsecondary training or education experience, this "institutional readiness" continuum may include several institutional or programmatic structures, including transition planning in the secondary grades, admissions and enrollment processes, and then, most concretely, institutional readiness to respond to the access needs of SDHH as they participate in postsecondary educational experiences.

Individual Readiness of Students who are d/Deaf or Hard of Hearing

Discussions of SDHH and academic achievement should be rooted in an understanding of the demographic characteristics of the population (Kluwin, 2008; Moores, 2004). SDHH are diverse in their etiology of deafness, language and communication modality, cultural identification(s), K-12 educational experiences, access to technology and opportunity to learn rigorous, college preparatory content (Cawthon, 2011; Lang, Biser, Mousely, Orlando, & Porter, 2004; Marschark, Lang, & Albertini, 2002). The process of identifying SDHH students through institutional records is difficult, leading to some discrepancies in various reports about what choices students make when they leave high school. Furthermore, the distribution of SDHH also varies such that there are some institutions that enroll a large number of SDHH and some that enroll only a few (US Department of Education, 1994). Even with varying estimates of enrollment and completion rates for students who are DHH, we do know that SDHH are a low-incidence population in postsecondary settings, likely numbering less than half a million students across the country (pepnet2, 2013).

Opportunity to learn rigorous content in an accessible setting has been a long-standing and significant obstacle for individuals who are DHH (Cawthon, 2000; Lang, 2002). As a result, SDHH experience significant levels of under-preparation for postsecondary education and employment opportunities (Bowe, 1988; Harris & Bamford, 2001; Johnson, 2004; Lang, 2002). For communities with traditionally very low levels of college enrollment, questions surrounding readiness and access are complex, yet they also present us with an opportunity to explore some of the underlying assumptions and implications behind educational reform. The following sections discuss the following important issues relevant to the discussion surrounding individual readiness for SDHH: academic readiness, language and communication readiness, soft skill readiness, and co-occurring disabilities. While not all-encompassing, and bounded by the current literature on factors that predict SDHH outcomes postsecondary education, this discussion provides a context for what may be required for institutions to have readiness capacity.

Academic Readiness

Academic readiness is arguably one of the most important aspects of readiness for individuals pursuing postsecondary education for students who are DHH (Convertino, Marschark, Sapere, Sarchet, & Zupan, 2009; Cuculick & Kelly, 2003). Much of our understanding of K-12 academic achievement and progress for SDHH at the national level comes from the Stanford Achievement Test-Hearing Impaired, or the SAT-HI (Holt, Traxler, & Allen, 1992, 1997; Mitchell, Qi, & Traxler, 2007).[4] The grade equivalencies from the SAT-HI allow for a comparison of achievement of SDHH with their hearing peers. Qi and Mitchell (2012) summarized achievement data over the past 30 years, illustrating two critical findings: first, that the median grade equivalent outcomes for graduating high school SDHH ranges between fourth and seventh grade, depending on the subject area, and second, that this finding has largely remained stable over time and across subjects (reading comprehension summary reproduced in Figure 2, Qi & Mitchell, 2012). While the normed median scores should not be considered descriptive of the entire population of SDHH due to challenges in sampling for the SAT-HI (Mitchell et al., 2007), these data do illustrate potential academic readiness challenges in making a transition from secondary to postsecondary settings (Cuculick & Kelly, 2003; Marschark et al., 2012).

[4] Participants were screened prior to taking the SAT-HI so that students did not take an assessment at a grade level too far above their current level of academic functioning; this practice results in out-of-level testing not typically a part of the SAT norming process.

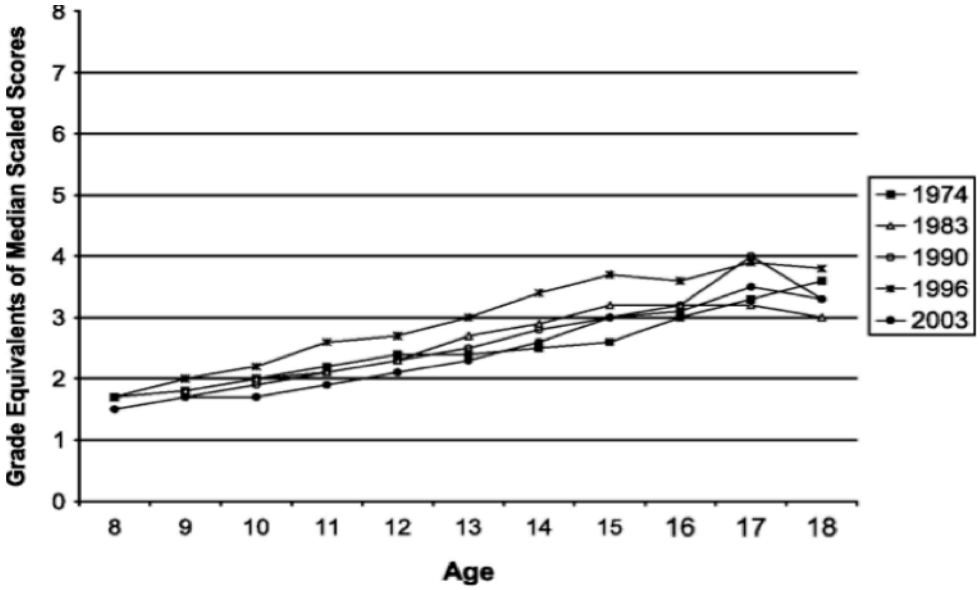

Figure 2. Grade equivalents of median scaled scores on Stanford Achievement Test for Deaf and hard-of-hearing student norming samples in the United States, by age, 1974 – 2003: reading and comprehension. Reprinted with permission.

Whereas literacy development is one of the primary foci of research in deaf education and academic outcomes, there is also further research looking at the underlying cognitive components to learning that may contribute to the DHH academic readiness. Even when controlling for a range of language and literacy variables for both the student and the classroom instruction, individuals who are DHH did not appear to benefit from classroom instruction at the same level of their hearing peers (Marschark, et al., 2009; Marschark, Sapere, Convertino, & Pelz, 2008). One hypothesis to explain this difference in classroom learning suggests that SDHH may have different meta-cognitive frameworks to acquire and integrate new knowledge. Meta cognitive strategies include essential tasks such as monitoring one's own comprehension and, particularly important, understanding when clarification is needed or when an alternate explanation may help increase one's grasp of the material. This hypothesis is supported by findings about differences in the types of problem solving strategies and methods for integrating information across contexts (Banks, Gray, & Fyfe, 1990; Marsharck, DeBeni, Polazzo, & Cornoldi, 1993; Spencer & Marschark, 2010). Measures of underlying factors that, in turn, contribute to academic readiness are thus critical for better understanding predictors of postsecondary success for SDHH.

Language and Communication Readiness

Academic readiness is necessary, but not sufficient, to ensure that SDHH complete their college degrees (Albertini, Kelly, & Matchett, 2012; Boutin, 2008; Cuculick & Kelly, 2003). Navigating a postsecondary environment also requires high-level language and communication skills (Albertini, et al., 2012; Convertino, Marschark, Sapere, Sarchet, & Zupan, 2009). Individuals who are DHH may, depending on a combination of factors, use a range of languages and communication modalities in postsecondary education, training, or employment settings (Spencer & Marschark, 2010). Unlike hearing individuals who typically have a single, auditory-based mode (listening and speaking) for both receptive and expressive language, DHH individuals may have varied language uses across different communication modalities. Most sign languages, such as American Sign

Language (ASL), rely solely on visual and manual (i.e., "on the hands and face") communication avenues, and are full languages with complex grammars and cultural variations. Fundamental to the issue of language and communication is the need to access an environment that is typically dominated by spoken language. Language and communication readiness for individuals who are DHH entering postsecondary settings can be pivotal in how they navigate a mainstreamed setting (Boutin, 2008; Gerber, Ginsberg & Reif, 1992; Stinson, Scherer, & Walter, 1987). Readiness in this context may include proficiency in academic sign language, if that is the communication modality used in the postsecondary education setting, or familiarity with how to work well with sign language interpreters if they are used to provide access to a spoken environment (Cokley, 2005; Gerber et al., 1992; Schick, Williams, & Kupermintz, 2006). Knowing how to discuss one's communication preferences to professionals who are not familiar with or who have not worked with DHH individuals also a form of language and communication readiness (Brown & Foster, 1989; Foster & Brown, 1988). Finally, socialization and feeling connected into a community is an important factor in persistence for students who are DHH (Stinson et al., 1987).

Soft Skills Readiness

College readiness is largely discussed within the context of skills that students should possess as they exit secondary education and enter into a range of postsecondary settings. Academic achievement is a core component of that readiness (Convertino et al., 2009). However, Sternberg, Bonney, Gabora, & Merrifield (2012, p 31) suggest that academic and complementary skills, together, including of self-advocacy, social skills, and leadership potential, are stronger predictors of performance in the first year than scores on entrance exams alone. Research into soft skills for students who are DHH emphasizes their importance in ensuring postsecondary enrollment, retention, and graduation (Boutin, 2008). Starting in secondary school, students who are DHH need these skills to successfully participate in IEP and transition planning process (Luft, 2010; Luft & Huff, 2012). Once in college, academic motivation, along with measures of reading and mathematics skills, are strong predictors of academic performance in the first quarter of college (Albertini et al., 2012). Academic motivation in SDHH may be related to one's career efficacy, or a person's belief that they can achieve their long-term goal (Michael et al., 2013). Although it can be challenging to tease out "soft skills" from other forms of readiness, this broader concept of an individuals' preparation for postsecondary experience is particularly relevant for individuals who may draw upon complementary strengths if they are academically not as strong as their peers (Boutin, 2008; Bowe, 2003; Convertino et al., 2009).

Co-occurring Disabilities

Many individuals who are DHH have a co-occurring disability or condition that affects their levels of academic, language, and soft skill readiness for postsecondary education (Knoors & Vervloed, 2011). Hearing loss is caused by a range of etiologies, some inherited, some congenital, some acquired later in life (Arnos & Pandya, 2011; Mitchell & Karchmer, 2011). Some of these etiologies result in a co-occurring disability that can affect a child's learning and academic experiences. For example, a large percentage of individuals who are DHH also have a disability such as a learning disability or ADHD, with some estimates ranging from 35% to over half of the DHH population (e.g., Gallaudet Research Institute, 2011). In fact, students with multiple disabilities may be as representative of the population as those without (Cawthon & the RES Team, 2012; Holden-Pitt & Diaz, 1988; Mitchell & Karchmer, 2005, 2006).

Institutional Readiness

While there has been some investigation as to DHH student preparedness for the transition to college, there has been little investigation into institutional preparedness to receive these students. Student commitment to an institution, even before clearly identifying a career path, is an important early step that affects retention (Tinto, 1987). More SDHH are attending postsecondary training settings, and are doing so at a greater number of settings, essentially "spreading out" beyond what has been a traditional core of "deaf-focused" institutions such as Gallaudet University, Rochester Institute for the Deaf, and California State University, Northridge, among others (pepnet2, 2013). Once students are enrolled, though, it is unclear what factors will support successful retention and program completion; current retention figures indicate a weakness in this area for institutions serving students who are DHH (Newman, et al., 2011).

Measuring Institutional Readiness

First and foremost, it is difficult to identify what is knowable about institutional capacity and its relationship with DHH student success beyond measures used across an entire student body. Most institutions (outside of those listed above) do not track or disaggregate outcomes for students who are DHH. Under the Americans with Disabilities Act (ADA) of 1990, unless students disclose their identities to an institution through an Office of Student Services, there is no formal system for identifying individuals on a campus or in a training program with a disability. Furthermore, it is even more challenging to connect individual student experiences with institutional structures with progress towards degrees (Albertini, et al., 2012; Tinto, 1987). This makes it nearly impossible to identify (a) DHH retention rates at an institutional level and (b) how effective the varied resources and programs are in increasing SDHH graduation and employment rates (Cawthon & the RES team, 2012). Large-scale datasets such as the National Longitudinal Transition Study-2 (NLTS-2) provide estimates of postsecondary enrollment and completion based on individually-reported data, but are not aggregated by location or place of enrollment, thus limiting their use in identifying institutional factors that promote or are obstacles to degree completion (Newman, et al., 2011).

Accommodations as Indicators of Readiness

Postsecondary institutions rely on accommodations and related services to provide access for their enrolled SDHH (Rawlinson, 1998). *Accommodations* refer to an overall umbrella of services that students with disabilities may receive to facilitate access within a mainstreamed educational environment (AERA, APA, NCME, 1999). Classroom accommodations typically aim to ensure that DHH students have access to the same instructional content as their peers, even if in a different language format or modality. These accommodations may include note takers, reading materials in large print, captioning on videos, an interpreter, or if needed, a classroom aide (Cawthon & the Online Research Lab, 2006, 2007). In terms of testing and assessment, accommodations may include extended testing time, a quiet testing space, a test administrator who is familiar with the student, an interpreter for test directions, or the use of a scribe, computer or other response formats better tailored for the student than hand written answers (Cawthon & the Online Research Lab, 2006, 2007). There is often an overlap between accommodations a student uses to complete homework or in-class assignments and those used on an exam, although due to concerns about test score validity, policy restrictions on accommodations tend to be more restrictive for testing than for classroom instruction (Cawthon, 2007).

The quality of accommodations available on campus and the type of resources the institution offers can be a significant factor in the overall education obtained by the student (Leppo, Cawthon, & Bond, 2013; Marschark, et al., 2006). Under ADA, institutions are required to provide

accommodations that are needed for individuals with disabilities to have equal access to educational opportunities, but how this is specifically implemented is relatively unknown (Cawthon, Nichols, & Collier, 2009). The expansion of accommodations options in recent years has likely contributed to the growing numbers of SDHH matriculating in a broad range of postsecondary settings. Despite this increase in enrollment and use of accommodations, SDHH still perceive many barriers in postsecondary environments; there is thus still work to be done on accommodations in this area (Punch, Creed, & Hyde, 2005; Willoughby, 2011). In interactive, collaborative environments where learning is designed to capitalize on a student's active engagement with peers and teachers, mediated communication via accommodations can be subpar to direct communication (Foster, Long, & Snell, 1999; Long & Beil, 2005; Saur, Popp-Stone, & Hurley-Lawrence, 1987; Stinson, Liu, Saur, & Long, 1996). However, in most mainstreamed settings, direct communication is not an accessible option and accommodations must attempt to fill the gap.

Effectiveness of accommodations are influenced by a number of factors, including changes in the legal context from secondary to postsecondary settings, the role of disclosure, challenges in implementation, and questions surrounding measures of impact of accommodations on student learning. The legal context is particularly important when thinking about the changes in responsibility and accountability for accommodations as students leave high school and enter postsecondary settings. Each of these topics as they relate to postsecondary institutional readiness to serve SDHH is explored below.

Legal Context

Three[5] main legislative acts that affect how students with disabilities gain access to institutional resources: (a) the Individuals with Disabilities Education Act (IDEA)[6], (b) the Americans with Disabilities Act (ADA),[7] and (c) the Rehabilitation Act of 1973 (Section 504)[8].

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[5] All three acts identify an individual who is d/Deaf or hard-of-hearing as having a disability, a categorization that does not reflect the cultural and linguistic characteristics of parts of the community (Lane).

[6] The Individuals with Disabilities Education Act (IDEA) first originated in 1975 as the Education for All Handicapped Children Act (EHA). IDEA specifically identifies areas of disability, including learning disabilities. The purpose of the law is to identify eligible students and describe educationally-focused services believed to assist these students achieve academically to the best of their ability. These services are to be given at no cost to the student or their families.

[7] When a student with a disability enters a postsecondary institution, or more specifically, when they attain the age of majority (18-years-old), they have the option to seek protection under ADA. Passed in 1990, the ADA is a federal civil rights law that protects all persons with disabilities from discrimination. Unlike IDEA, ADA does not provide explicit guidelines on how to determine if a person has a disability or who makes that determination. The ADA states that a person has a disability if the individual has a "physical or mental impairment that substantially limits one or more of the major life activities of such individual, the individual has a record of such an impairment; or is regarded as having such impairment" (Americans with Disabilities Act, 1990). Once a person is considered to have a disability under ADA they are entitled to accommodations that allow them to engage in activities *at the same level as their peers without a disability*.

[8] *Rehabilitation Act of 1973*. The Rehabilitation Act of 1973 prohibited discrimination by federal agencies and by federally funded programs. The Rehabilitation Act of 1973 was passed during the civil rights era and reflects a focus on access and inclusive participation in publicly funded institutions. Because most school districts and universities in the country receive federal aid, Section 504 of the Rehabilitation Act effectively covers all students in public education from discrimination or limited access to services on the basis of a disability. Section 504 has a broad definition of disability: under this law, individuals with disabilities are defined as persons with a physical or mental impairment that substantially limits one or more major life activities. Adequate access to curriculum is the central question when a school or program is asked to provide services to a student with a disability.

Under IDEA, once a child is determined to have a disability and to be eligible for services, elementary and secondary schools are required to develop and carry out an Individualized Education Program (IEP) plan. At the time a student reaches high school, the role of the IEP plan is not only to identify and document current services, but to also articulate the student's postsecondary goals.

There are significant differences between IDEA, the law that governs special education in secondary institutions, and ADA, which applies to postsecondary institutions. Unlike IDEA, where the school is responsible for providing services, under ADA *the students* must initiate this process, and are not entitled to protection if they do not inform the school of their disabilities. The institution is not required to "search and serve" in the same way elementary and secondary institutions under IDEA. This policy respects an individual's right to privacy but also limits the accountability of the institution to ensure that their students or employees have as full access to the content or experience as possible. Although the institution must provide reasonable accommodations to students to ensure equal access to training and education opportunities, the onus of responsibility is on the students, and their agency is a key factor in how and when ADA becomes applicable for a student's access to accommodations or other resources in a postsecondary setting.

Role of Disclosure

Postsecondary institutional climates and policies regarding accommodations requests may influence the degree to which students are willing to initiate the process of obtaining services. Disclosing one's disability is a complex act, one that has multiple levels and varying degrees, ranging from notifying the institution that one may be eligible for an accommodation (Lynch & Gussel, 1996) to actually using it, often times in view of one's peers (Braithwaite, 1991). A person's willingness to engage in each of these activities will depend, in part, on their perception that the process is both worth the effort and that the accommodations are a valuable resource worth disclosing one's disability (Barnard-Brak, Sulak, Tate, & Lechtenberger, 2010; Luckner & Stewart, 2003). There is a level of risk involved for the student, both in that they are asking the faculty members for their assistance or time, and in that others may not view them in the same light once they know about the disability. Faculty members' acceptance of accommodations and willingness to work with a student thus affects the likelihood that a student will disclose (Cole, 2012).

Characteristics specific to DHH, including language use and degree of hearing loss, may play a role in whether DHH students request accommodations. For students who are DHH, the degree of hearing loss appears to be a predictor of whether or not they disclose their disability, and thus guide what accommodations an institution must be ready to provide (Newman, et al., 2011). SDHH are more likely to disclose their disability (59% overall) than students with other disabilities (28%) (Newman, et al., 2011). Students with severe to profound hearing loss (98%) are more likely to disclose than students with moderate (83%) or mild loss (57%). This discrepancy is perhaps because students who are d/Deaf are more likely to use sign language or other visual modality for language access, and thus more likely to need accommodations at their institution than those who may use personal devices such as a hearing aid. Furthermore, students who are hard-of-hearing may not be aware of how much they might benefit from an accommodation in postsecondary settings because they did not need one in the relatively small context of high school (Cawthon & the RES Team, 2012). Institutions need to be aware that SDHH may vary in their understanding of the demands of the new postsecondary setting and resultant changes in access needs (Luft, 2010; Luft & Huff, 2012).

Challenges in Implementation

Institutional capacity to implement accommodations includes both concrete factors, such as local availability of high quality interpreters, and less tangible factors, such as the openness and flexibility of faculty and staff (Cawthon & the RES Team, 2012; Cole, 2012). For SDHH, availability of high quality interpreters is an important factor in a successfully accommodated experience (Schick, Williams, Kupermintz, 2005). Currently there is a shortage of qualified educational interpreters (Carew, 2001; Schick, et al., 2005), particularly in rural areas, jeopardizing equal access under the law. Web-based, Video Remote Interpreting is one way in which technology may partially alleviate access issues, because institutions with sufficient bandwith and computer resources can provide access using off site resources (McCuller, n.d.; Simon, 2010). Research on the effectiveness of other new technologies such as real-time captioning illustrates the importance of both text-based and visual language-based (e.g., ASL) accommodations for SDHH (Marschark, et al., 2006). Increasing quality, technology options, and best fit with the instructional setting are decisions that an office of students with disabilities can facilitate with individuals who are DHH (Cawthon, Nichols, & Collier, 2009).

Measuring Impact

What is the real impact of a well-implemented accommodation on student retention and completion? Studies of the impact of accommodations on student learning or on assessment results indicate that accommodations may provide access, but largely do not change the learning outcomes or assessment scores of students who are DHH (Cawthon, Winton, Garberoglio, & Gobble, 2011; Convertino, et al., 2009; Marschark, et al., 2006). In some cases, the impact of an accommodation may be determined by its availability (Cawthon & the RES Team, 2012). In a survey of over 1,000 professionals on the extent to which they felt availability of an accommodation (or lack thereof) was a barrier to student success, very few (3.9%) felt that availability of accommodations was a persistent problem that always affected student outcomes. On the other extreme, relatively few (16.7%) felt that it was never a problem, that students had full access to accommodations that were needed to facilitate successful outcomes. The remaining responses lay in the middle, ranging from occasionally (30%) to sometimes (29%) to often (20%). Institutions seeking to evaluate the effectiveness of accommodations may have difficulty identifying their impact with such a mixed experience.

By way of illustration, we present an example from the first author's work with pepnet2, a federally funded initiative to support postsecondary outcomes for individuals who are DHH through professional development and technical assistance (www.pepnet.org).

> A hard-of-hearing student who had never received accommodations in high school enrolled in a physical therapy training program and quickly became aware that he was missing important information and struggling to pass the course. His request for speech-to-text captioning was at first denied. It took several rounds of advocacy with the institution over the course of several months to articulate (a) his rights under ADA and (b) the institution's responsibility to provide access for the student to the content of the physical therapy course material through more substantive accommodations than a note taker, which would not allow the student to engage in the classroom interaction at the same level as his peers. As a result, the student is still enrolled in the program, and has progressed to the next level of coursework.

Although this story is but one anecdote in a discussion about the importance of accommodations in retention for students who are DHH, it is conceivable that struggles like this may be a part of why retention rates for this population continue to be lower than for students who are hearing.

Areas for Further Exploration

There are auxiliary issues that arise when thinking about both individual and institutional readiness for SDHH (Cawthon & the RES Team, 2012). While these issues are not as prevalent in the research literature, they do reflect systemic realities about postsecondary education access for SDHH. This section explores three topics that cut across both individual and institutional readiness: students who are low-functioning deaf, the prospects of online technologies as a feature of a ready institution, and strategies that institutions might consider when looking accessibility of life of the campus as a whole for SDHH.

When College Readiness is not Possible

The majority of research has focused on students pursuing a bachelor's degree or attending a traditional two- or four-year program. However, this experience is not representative of all students who are DHH. Beyond the research on learning experiences for SDHH in colleges or universities, there is a segment of the DHH population that, like their hearing peers, are not ready for a college experience or an independent career upon exit from high school. This population is sometimes referred to in the literature as "low functioning deaf", or LFD, and represent approximately a quarter of the DHH population (Bowe, 2003, p. 485). These are students who, after 12 years of schooling, are not reading beyond a first or second grade level and are unlikely to live independently without significant systemic support. LFD individuals are more likely to have additional disabilities, which, combined with a possible lower non-verbal IQ, face greater challenges to learning than their DHH peers without an additional disability.

Given the complexity of skills needed to be successfully college ready, and the influence of "low functioning" characteristics, many students who are DHH are unlikely to receive a standard high school diploma (Appleman, Callahan, Mayer, Luetke, & Stryker, 2012). There is a dearth of programs and experiences in place to provide opportunities for LFD (Long & Clark, 1993). Many LFD are served by Independent Living Centers or Community-Based Centers that promote a holistic approach to services and accommodations to meet the complex needs of their clients. These programs are outside the realm of even the two-year community college programs and vocational training programs where the majority of DHH individuals gain postsecondary education. Access to these opportunities requires the coordination of many agencies and resources, such as Vocational Rehabilitation, coordination that can be challenging to implement effectively (Certo, et al., 2005).

Increasing Institutional Readiness Online

Online instruction formats may be one way that institutions can increase their level of readiness to serve SDHH. In contrast with the speech-heavy communication in face-to-face lectures, most online programs impart the vast majority of information in a text format. The bulk of online teaching and feedback activities are conducted not "live" but asynchronously; faculty post discussion threads, students respond in dialog, and student feedback can be provided individually via online portals. Materials can also viewed at a pace that does not require a note taker service to supplement classroom attendance (Kay & Lauricella, 2011). Videos can be captioned and, once captioned, made available to all students who may need them in the future.

Research on online learning has shown promise for students who do not have strong English literacy skills, such as SDHH, or individuals who are engaging in their second language in this context (Long, Marchetti, & Fasse, 2011, Stinson et al., 1996). Even for classrooms with a combination of face-to-face and an online component (e.g., "blended learning"), there remains a potential for increased engagement for SDHH than in solely an accommodated face-to-face setting (Long, Vignare, Rappold, & Mallory, 2007). The need for assessment accommodations may also

decrease in online classes; in asynchronous learning formats, very few assignments are timed, allowing for flexibility in time and place for completing papers and exams. As a result, all students are in the same learning environment without the need for (as many) accommodations to access the course content.

However, there are also a number of drawbacks to an online setting for SDHH that may not be obvious on the surface (Lang & Steely, 2003). First, online learning requires a significant level of reading and writing skills. As noted earlier, many individuals who are DHH may not have reading skills that match the reading level of postsecondary instructional materials (Qi & Mitchell, 2012). In order for the primarily written platform to be accessible, it may be necessary to first screen the reading and writing level of incoming students and to support struggling readers in a text-dense learning environment (Convertino, et al., 2009). There is also an affective component to engagement in any setting, including online. For SDHH with below-grade level writing skills, there may also be a reluctance to participate in a setting where an individual's writing skills are evaluated by peers.

Readiness Beyond the Classroom

There are many dimensions to an accessible campus setting that go beyond the classroom (Hyde, Punch, Power, Hartley, Neale, & Brennan, 2009). Some aspects are more salient than others and are relevant at different points during the application, enrollment, and retention experience (Cawthon & the RES Team, 2012). For example, students often visit a potential campus or program site before deciding to apply. How does a prospective SDHH request an initial accommodation for a campus tour? Are online videos of activities on campus captioned and/or provided in ASL? Entry points such as the campus website signal to prospective SDHH how much infrastructure and awareness is already in place at the institution.

Under ADA and section 504, accommodations for SDHH are required not just in a classroom, but in residential and social environments as well (National Association of the Deaf, n.d.). For programs with a residential component, to what extent are the facilities already equipped with some rooms that have light flashing emergency signals or message boards that display announcements in a text format? New technologies such as text and pager systems for emergencies advance the ability to use text instead of auditory broadcast announcements in both routine and emergency situations. Dormitories serve as a social hub for students. Does the building have sufficient lighting, sightlines, and way to reduce glare from the outside when having a conversation with a peer? When new facilities are planned, are accessibility issues for SDHH considered and included in a Universal Design approach to the building and its use? To the extent that this has been done, institutions can inform students and highlight accessibilities features in the campus or workplace infrastructure.

Finally, and perhaps least salient, is the general campus or workplace climate openness towards individuals who are DHH? There are interactions at a policy, institutional and interpersonal levels that contribute to a campus's openness and reception to SDHH. Colleagues, supervisors, faculty, and staff, as long-term members of a campus or training setting, set the tone for how welcoming an institution is towards its members who are DHH. Are interpreters present at every public event? When a request for an accommodation is made, how difficult is it to implement? Do the leaders in the community look for ways to problem-solve potential challenges? And finally, to what extent do the institution's members interact with DHH resources in their community? The Deaf community is a nationwide community and often well connected. Institutions that reflect a climate of support are so noted in community discourse, and as such, prospective SDHH often learn of an institution's readiness through personal connections and dialogue in the community (Cawthon & the RES Team, 2012).

Conclusion

Successful college readiness is dependent on an understanding that *both* the individual and the institution must be ready; individuals must be academically prepared, with appropriate "soft skills", and the institution must be prepared to fully include students in their programs or offerings. In many cases, what we theorize and know about postsecondary readiness for SDHH touches upon the same knowledge about factors for students who are hearing. However, even if some the domains are similar across all students, there are unique factors related to being DHH that have an impact on how students build and demonstrate success. Across the board, for students who are DHH, readiness includes not only academic and cognitive strategies, but also working with and negotiating one's own identity within a complex institutional context that is not yet necessarily "ready" for them. SDHH offer postsecondary institutions an opportunity to think critically about how to increase their readiness for a diverse student population.

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