Transition Issues in Educational Audiology

Rebecca Bareli

Graduate Center, City University of New York

6-2016

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TRANSITION ISSUES IN EDUCATIONAL AUDIOLOGY

by

Rebecca Bareli

A capstone research project submitted to the Graduate Faculty in Audiology in partial fulfillment of the requirements for the degree of Doctor of Audiology, The City University of New York

2016
This manuscript has been read and accepted for the Graduate Faculty in Audiology in satisfaction of the capstone project requirement for the degree of Au.D.

_________          _______________
Date                  Brett Martin, Ph.D., CCC-A
                      Chair of Examining Committee and Executive Officer

THE CITY UNIVERSITY OF NEW YORK
Abstract

TRANSITION ISSUES IN EDUCATIONAL AUDIOLOGY

By

Rebecca Bareli

Faculty Advisor: Brett Martin, Ph.D.

Despite advancements in assistive technology for hearing loss (hearing aids, cochlear implants), children with hearing loss still face a host of issues throughout the educational process, particularly during transitional periods. This literature review examines the existing research discussing these issues, including transitions from childhood to adolescence, high school to college, and college to the workforce.
TABLE OF CONTENTS

Abstract iv
List of Tables vi
Introduction 1
Hearing Loss in Children 1
Transitioning from Childhood to Adolescence 5
Transition to College and Employment 16
Summary and Conclusions 25
References 27
List of Tables

Table 1. The etiologies of hearing loss in U.S. newborns, children, and adolescents 2

Table 2. Summary of key papers examining the emotional parameters of identity and inclusion during the transition from childhood to adolescence. 6

Table 3. Summary of key papers examining the effects of various educational methods and classroom settings on educational outcomes for children with hearing loss. 9

Table 4. Summary of key papers examining the social parameters that relate to adolescents with hearing loss. 12

Table 5. Summary of key papers examining the transition to employment and the workforce for individuals with hearing loss. 19
Transition Issues in Educational Audiology

This review paper examines transition issues in educational audiology. After a brief introduction to hearing loss in children, the paper will examine the existing literature addressing the transitions from childhood to adolescence, adolescence to college, and college to the workforce as they pertain to individuals with hearing loss.

Hearing Loss In Children

A number of studies have examined the prevalence of hearing loss in children and adolescents. These studies have indicated differing degrees of deafness and hearing loss amongst this population in the United States. A report from The Center for Disease Control (CDC) titled the National Health Interview Survey (1997-2005), indicated the presence of some degree of hearing loss in 5 out of every 1,000 children ages of 3-17 (Boulet, Boyle, & Schieve, 2009). Shargorodsky, Curhan, Curhan, and Eavey, 2010) reported that in the United States, hearing loss in adolescence has increased significantly in recent years, from 14.9% in 1988-1994 to 19.5% in the years 2005-2006.

The causes of childhood hearing loss have been examined. For example, Mehra, Eavey, & Kearny Jr. (2009) used weighted averages of the data from seven studies to list the most common etiologies of hearing loss in United States for newborns, children, and adolescents. The results are shown in Table I.
Table 1. The etiologies of hearing loss in U.S. newborns, children, and adolescents

<table>
<thead>
<tr>
<th>Etiology</th>
<th>Prevalence</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genetic</td>
<td>23%</td>
<td>Nonsyndromal 48%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Syndromal 52%</td>
</tr>
<tr>
<td>Acquired</td>
<td>20%</td>
<td>Prenatal 17.3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Perinatal 12.1%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Postnatal 70.5%</td>
</tr>
<tr>
<td>Other</td>
<td>1.2%</td>
<td>Includes posterior fossa tumors, cysts/cyst removal, cochlear dysplasia, and congenital malformations of the ear</td>
</tr>
<tr>
<td>Unknown</td>
<td>56%</td>
<td>--</td>
</tr>
</tbody>
</table>

Note that the most common etiology is “unknown”. The wide range of etiologies and circumstances associated with childhood deafness lead to varied and complex effects.

Early identification of hearing loss is critical and the age of identification and remediation impact the effects of the hearing loss. For example, in a widely cited study, Yoshinaga-Itano, Sedey, Coulter, and Mehl (1998) reported that when deafness or hearing loss was identified by six months of age, children performed significantly better on receptive and expressive language ability tasks than did their peers whose hearing
losses were identified later in life. These findings occurred across all ages, communication modes, and degrees of hearing loss, indicating the pervasive importance of early identification.

**The Remediation of Childhood Hearing Loss**

Before elaborating upon research relevant to the amplification preferences of school-age children and adolescents, the range of possible interventions and related issues will be summarized. Hearing aids are the most standard approach to amplifying sound; however, they do not necessarily provide sufficient assistance for children with hearing loss who struggle in classroom environments. This is because the most common hearing aid shortcomings are ones that will be particularly problematic in academic settings.

For example, one of the most common complaints of hearing aid users is the ability to hear and discriminate speech in noisy environments (Kochkin, 2002; Killion, Niquette, Gudmundsen, Revit, & Banerjee 2004). Another common complaint is that hearing aids do not provide full benefits when listening at a distance; more specifically, when the talker or other source of speech is located not sufficiently close to the listener. As elaborated upon before, these are both issues that become prominent in a classroom environment (Crandell & Smaldino, 2000).

There are similar complaints regarding cochlear implants. Cochlear implants are surgically implanted devices that bypass the damaged cochlea and directly stimulate the eighth nerve. Thus, individuals with severe or greater hearing loss can obtain access to auditory stimuli with these devices (Wilson & Dorman, 2008). While cochlear implants provide children with the benefits of auditory stimulation, they do not restore “perfect”
hearing, and as such, communication and learning difficulties can still ensue. As with hearing aids, common complaints in the classroom are related to complicating factors such as distance and noise.

The use of assistive listening devices in the classroom, such as FM systems, serve the purpose of increasing the signal-to-noise ratio and overcome the problem of distance from the talker to ensure better intelligibility of speech, and thus improve learning and related measures for children with hearing loss. These devices can be used either alone, or in combination with the hearing aids or cochlear implants. Numerous studies have indicated that FM systems, in combination with hearing aids, resulted in significant improvements in speech recognition scores for children with mild to severe hearing loss (Anderson and Goldstein, 2004).

**The Impact of Childhood Hearing Loss**

While any disability can naturally impact all realms of a child’s development, the effects of hearing loss are particularly powerful. Boulet, Boyle, and Schieve (2009) found that deafness and hearing difficulty were two factors highly correlated with health and functional impact. When health and functioning are impacted, it follows that emotional circumstances would differ as compared with children who are not impacted by the same disabilities. Specifically, deafness and hearing loss, which bear such a strong impact on daily communication, could have particularly harmful effects. Kouwenberg, Rieffe, Theunissen, and Oosterveld (2011), for example, suggested that children with hearing loss may have emotional difficulties because most of them grow up in hearing families, and are not able to communicate as effectively as those surrounding
them. Unlike in older adults, a population in which hearing loss is common, children with hearing loss or deafness may feel particularly isolated. As will be discussed below, these factors, combined with the need to adapt to changes and different settings through adolescence, presents unique challenges to young people with deafness.

**Transitioning from Childhood to Adolescence**

**Emotional Parameters**

Identity and emotional constructs related to inclusion are crucial parameters in transitioning from childhood to adolescence. This transition can be particularly challenging for individuals with hearing loss (Kent & Smith 2006; Jamieson, Zaidman-Zait, & Poon 2011; Punch & Hyde 2011). A number of studies have addressed the emotional parameters surrounding this transition to adolescence in individuals with hearing loss. The findings of key papers examining the emotional parameters of identity and inclusion during the transition from childhood to adolescence are summarized in Table 2.

In a survey of fifteen adolescents with hearing loss, Elkayam and English (2003) noted that feelings of isolation were a common concern. Interestingly, most of the participants reported slightly greater effects of this isolation than did their normally hearing friends. That is, their normal-hearing friends were likely to underestimate the degree to which the individuals with hearing loss felt isolated. This indicates that in addition to the isolation inherent in hearing loss, further isolation may be fostered by the lack of understanding by peers and other surrounding individuals.
Table 2. Summary of key papers examining the emotional parameters of identity and inclusion during the transition from childhood to adolescence.

<table>
<thead>
<tr>
<th>Study</th>
<th>Participants</th>
<th>Variables</th>
<th>Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elkayam and English (2002)</td>
<td>• n=20</td>
<td>• communication difficulties in various situations</td>
<td>• in addition to the isolation inherent in hearing loss, further isolation may be fostered by the lack of understanding by peers and other surrounding individuals.</td>
</tr>
<tr>
<td></td>
<td>• Mean age=14.49 yrs (range 12-18 yrs)</td>
<td>• general feelings about HL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• bilateral PTA ≥25 dB HL</td>
<td>• Perceived attitudes of others toward individual with HL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Oral communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 students attended residential schools for the deaf, 11 attended mainstream programs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 used sign language, 5 used speech, 8 used both</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charlson, Strong, and Gold (1992)</td>
<td>• n=23</td>
<td>• isolation and loneliness</td>
<td>• most students exhibited isolation (social, communicative, academic, or familial)</td>
</tr>
<tr>
<td></td>
<td>• deaf adolescents identified as “outstandingly successful” by school personnel</td>
<td>• resources used to avoid or combat negative experiences</td>
<td>• communication difficulties were almost always the direct cause or an exacerbating factor</td>
</tr>
<tr>
<td></td>
<td>• 12 students attended residential schools for the deaf, 11 attended mainstream programs</td>
<td></td>
<td>• most successful students appeared to be the ones attending residential schools and who had deaf parents</td>
</tr>
<tr>
<td></td>
<td>• 10 used sign language, 5 used speech, 8 used both</td>
<td></td>
<td>• contact with other deaf peers identified as key strategy in combating isolation</td>
</tr>
<tr>
<td>Punch &amp; Hyde (2011)</td>
<td>• 25 parents of children/adolescents with cochlear implants (age at implantation mean=4.5; range 4-16.1)</td>
<td>• socioemotional well-being</td>
<td>• all participants expressed appreciation of cochlear implants’ ability to enable relationships between profoundly deaf children and hearing peers</td>
</tr>
<tr>
<td></td>
<td>• 15 teachers of the aforementioned children</td>
<td>• peer relationships</td>
<td>• nearly all parents and teachers expressed concerns about socialization</td>
</tr>
<tr>
<td></td>
<td>• 11 children and adolescents with cochlear implants (mean age=14.1; age range 10.2-17.3)</td>
<td>• social inclusion with hearing and deaf peers</td>
<td>• all groups concerned about issues relating to friendships and “fitting in”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• in spite of communication proficiency,</td>
</tr>
</tbody>
</table>
participants still experience difficulty in group situations and identify as “hard of hearing”

<table>
<thead>
<tr>
<th>Jamieson et al. (2011)</th>
<th>n=38</th>
<th>family support needs for entering adolescents</th>
<th>parents reported the need for information about cognitive and social emotional development of their children, family centered service provision, concern about education, and concerns regarding additional special needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>parents of children mean age=13.2, range 10-18</td>
<td>hearing loss ranged from mild/moderate to severe/profound</td>
<td>79% reported using spoken communication at home; remaining used sign language alone or with spoken language</td>
<td></td>
</tr>
</tbody>
</table>

Charlson, Strong, and Gold (1992) examined isolation as a factor in the lives of 23 successful high school students with hearing loss. The students’ academic programs ranged from mainstream settings to residential programs for individuals with hearing loss. “Success” was not defined qualitatively or quantitatively; rather, principals or program coordinators of schools involved in the study were asked to nominate students that they believed could be considered “outstanding”. To assess the dependent variable of “success”, researchers conducted interviews with the students, their parents or guardians, and their teachers or administrators. They also examined school records and observed a family interaction.

Nearly all the participants in the study reported isolation in one or more of the categories studied (social, communicative, academic, or familial), and in nearly all of these cases, communication difficulties were reported. Indeed, the most successful students were those who attended schools for individuals with hearing loss and had deaf
parents, because there were fewer communication issues in this situation. The study found that effective ways to deal with perceived isolation included contact with other deaf peers. This finding must be interpreted in the context of the times in which the study was conducted. Because increasing numbers of deaf children are receiving cochlear implants (reference) and have increased access to spoken English, it is possible that results might be different today.

Adolescence marks the beginning of a number of concerns about future transitions in adolescents with hearing loss as well as their parents. For example, concerns amongst adolescents and their parents include issues related to postsecondary education, dating, and career choices are raised (Punch & Hyde, 2011) and these factors will be discussed in depth later in this paper. Conversely, Jamieson et al. (2011) found that in parents, this transitional phase was accompanied by a resurgence of the grief they had experienced both at the child’s initial diagnosis, as well as at previous transitional periods.

Elkayam and English (2003) note that given many of the identity shifts (including establishment of autonomy, identification of self, and affiliation with a peer group) taking place at this time, counseling may be a particularly important component of aural rehabilitation for adolescents. Paradoxically, however, adolescents may be less likely than adults to openly express their difficulties. Thus, they suggest that a questionnaire might be a particularly effective counseling tool for this group.
**Educational Parameters**

Current literature addresses a wide range of academic and educational transitions relating to adolescents with hearing loss. Jamieson et al. (2011) notes that adolescents with hearing loss, as well as their parents, had difficulty with the transition from elementary school, an environment that was family-centered, to middle and high school, which typically consisted of environments that were more student-centered and involved less parental input.

A number of studies have compared the effects of various educational methods and classroom settings on educational outcomes for children with hearing loss. The key findings of these studies are summarized in Table 3.

**Table 3.** Summary of key papers examining the effects of various educational methods and classroom settings on educational outcomes for children with hearing loss.

<table>
<thead>
<tr>
<th>Study</th>
<th>Participants</th>
<th>Variables</th>
<th>Key Findings</th>
</tr>
</thead>
</table>
| Tobey, Rekart, Buckley, and Geers (2004) | • n=131  
• congenitally deaf children between the ages of 8 and 9  
• Received cochlear implants before age 5  
• Participants were either enrolled in special education programs, partially mainstreamed programs, or fully mainstreamed programs | • speech intelligibility  
• educational setting | • higher speech scores were correlated with educational settings that emphasized oral communication  
• environments that incorporated exposure to normally hearing students were associated with higher speech intelligibility scores |
| Kouwenberg, Rieffe, Theunissen, & Oosterveld (2011) | • n=186  
• 73 deaf or hard of hearing children and adolescents and 113 normally hearing children and adolescents  
• mean age=11 years | • somatic complaints and emotional functioning  
• social isolation  
• academic difficulties | • deaf children in mainstreamed schools reported higher levels of happiness than deaf children in special schools |
Tobey, Rekart, Buckley, and Geers (2004) studied speech intelligibility scores in 131 children between the ages of eight and nine. Participants were congenitally deaf, and had received cochlear implants before the age of five years. Children were classified by their educational setting, either total communication or auditory oral. Parent questionnaires were administered to determine the parents’ emphasis on speech and auditory development before and after implantation, and at the time of testing. Results indicated that higher speech scores were correlated with educational settings that emphasized oral communication. Furthermore, environments that incorporated exposure to normally hearing students were associated with higher speech intelligibility scores.

In a more recent study, Kouwenberg, Rieffe, Theunissen, & Oosterveld (2011) found that deaf children in mainstreamed schools reported higher levels of happiness than deaf children in special schools. Similarly, Theunissen et al. (2011) studied children with varying degrees of hearing impairment detected prelingually or perilingually. All participants used hearing aids or cochlear implants. Those with cochlear implants had them implanted since the ages of eleven months to ten years and eight months. The study found that attending mainstream schools, as well as using speech exclusively, was correlated with less depression in hearing-impaired children. The authors note that this
may be due to the fact that hearing-impaired children in special schools were raised more protectively, learning different coping mechanisms. Furthermore, children with additional disabilities in addition to hearing loss might be more likely to be sent to special schools. Again, these findings indicate the numerous factors that interplay to affect the emotional status and development of children and adolescents with deafness and hearing loss.

**Social Parameters**

Social factors play a tremendous role in the formation of identity in individuals with hearing loss, and in how they handle major transitions in general. In fact, in a survey of parents of thirty eight Canadian pre-adolescents and adolescents with hearing loss, Jamieson et al. (2011) found that one of the key concerns that distinguished these parents from parents of younger children with hearing loss was the need for information about social-emotional development; in focus groups conducted by the researchers, many parents of teenagers with hearing loss expressed interest in counseling services for both themselves and their children. Issues related to social parameters are summarized below in Table 4.

In a cross-sectional study of 191 Dutch pre-adolescents and adolescents with hearing loss, Wolters, Knoors, Cillessen, and Verhoeven (2012) reported that during elementary school, a child’s relationship with his or her teacher was the primary predictor of overall well-being. However, after the transition to a mainstream middle school, the relationship with peers became the primary predictor. Interestingly, however, for
students who transitioned to special education middle schools, the relationship with the teacher remained the primary predictor of well-being.

Punch and Hyde (2011) interviewed Australian children and adolescents with cochlear implants, along with their teachers and parents. The study found that issues related to emotional well-being, peer relationships, and social inclusion were exacerbated during transitions to new middle or high schools with support for students with hearing loss. In many cases, the decision to attend these schools separated them from their elementary school peers. Similarly, Wolters, Knoors, Cillessen, and Verhoeven (2011) suggest that before transition to middle school, mainstream students may have become accustomed to the students’ hearing loss. However, in a new school, the adolescent with hearing loss encounters a new peer group, many of whom are introduced to the notion of hearing loss for the first time. These students may be less familiar with the hearing loss and thus, may not have developed skills to help effectively communicate with individuals who do not have normal hearing. This may result in reduced acceptance of the adolescent with hearing loss.

**Table 4.** Summary of key papers examining the social parameters that relate to adolescents with hearing loss.

<table>
<thead>
<tr>
<th>Study</th>
<th>Participants</th>
<th>Variables</th>
<th>Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wolters, Knoors, Cillessen, and Verhoeven (2012)</td>
<td>• 87 deaf and hard of hearing 6th graders</td>
<td>• Social relationships with hearing peers</td>
<td>• after the transition to a mainstream middle school, the relationship with peers, rather than with the teacher, became the primary predictor of well-being.</td>
</tr>
<tr>
<td></td>
<td>• 672 hearing 6th graders</td>
<td>• Popularity</td>
<td>• for students who transitioned to special education middle schools, the relationship with</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Communicative skills, social behavior, and personality</td>
<td></td>
</tr>
</tbody>
</table>
Adolescence brings with it a range of new communication issues, including socialization in environments with loud music, and increased usage of telephone conversations (Punch and Hyde, 2011). Henderson, Grinter, and Starner (2005) explored telephone usage, and usage of other communication technologies by individuals with hearing loss, in greater detail. They found that teenagers with hearing loss and teenagers

<table>
<thead>
<tr>
<th>Study</th>
<th>Participants</th>
<th>Research Questions</th>
</tr>
</thead>
</table>
| Punch and Hyde (2011)                | • 25 parents of children/adolescents with cochlear implants (age at implantation mean=4.5; range .4-16.1)  
• 15 teachers of the aforementioned children  
• 11 children and adolescents with cochlear implants (mean age=14.1; age range 10.2-17.3)  
| • socioemotional well-being  
• peer relationships  
• social inclusion with hearing and deaf peers  
| • issues related to emotional well-being, peer relationships, and social inclusion were exacerbated during transitions to new middle or high schools with support for students with hearing loss  
• decision to attend these schools separated students with hearing loss from their elementary school peers  
| Wolters, Knoors, Cillessen, and Verhoeven (2011) | • 87 deaf and hard of hearing 6th graders  
• 672 hearing 6th graders  
| • Acceptance, popularity, communicative skills  
• Educational setting, hearing status, gender  
| • Boys with hearing loss in mainstream programs were less accepted and popular than those in special education  
• Girls with hearing loss in mainstream education were less popular but not less accepted  
• Mainstreamed children displayed better social skills than their peers in special education  

|
with normal hearing both had similar communication goals: quickly and effectively communicating, and being able to do so with a variety of individuals.

Furthermore, the study found that deaf individuals preferred to use instant messaging to communicate with other deaf individuals, and had no distinct preference regarding communicating with individuals with normal hearing. The study noted, however, that all tested participants considered communicating with hearing individuals to be important, and found that many of the participants felt mobile devices were a good way to accomplish this goal.

It should be noted that the aforementioned study has several notable weaknesses. Firstly, the small sample size (n=12) does not allow for generalization, as noted by the authors. Indeed, many of the results noted were anecdotal. Another weakness lies in the fact that the study had no control group of normally hearing individuals, making it impossible to determine if the communication preferences described in the results were specific to teenagers with hearing loss, or teenagers in general. Furthermore, the technological landscape has changed so much in the last ten years that it is unlikely the preferences noted in the study, both of the individuals with and without hearing loss, would remain relevant. Additionally, the age of detection of hearing loss has been reduced greatly in the last ten years, resulting in earlier intervention, and improvement in communication skills of individuals with severe to profound hearing loss.

Another notable transition in adolescence is the transition to driving. There is little research available regarding adolescents with hearing loss and this particular transition, but some relevant studies will be discussed. Hickson, Wood, Chaparro, Lacherez, and Marszalek (2010) studied a group (n=107) of Australian senior citizens
both with and without hearing loss. Driving ability was assessed on a closed circuit by trained research staff on a number of objective parameters, including time to complete the course, road sign recognition, hazard recognition and avoidance, gap perception, and a composite score. The study found that moderate to severe hearing impairment was correlated with poorer driving performance than normally hearing individuals when either auditory or visual distracters were present. Furthermore, the impact was greater for those with moderate or severe hearing loss than for those with mild hearing loss. Notably, however, all participants in this study were elderly, and hearing loss in this group might signal the presence of cognitive decline or other cognitive factors.

Factors Relating to Usage of Amplification

Indeed, Kent and Smith (2006) studied factors relating to amplification usage in New Zealand adolescents with moderate to severe bilateral hearing loss. The study found that a strong positive identity was the factor that correlated most strongly with willingness to wear hearing aids. Those perceiving their hearing aids as “normal” were the ones who used them most frequently. This component was more important than age at hearing aid fitting, length of time since hearing aid fitting, or degree of hearing loss when determining the likelihood that an adolescent would comply with necessary amplification.

Naturally, visibility of hearing aids or other devices is a key issue relating to identity as an individual with hearing loss. Parents and teachers noted an increased self-awareness regarding hearing aids and cochlear implants compared to the childhood phase (Punch & Hyde, 2011). Even adolescents who have comfortably accepted hearing aids as part of their identity often take action to make their amplification as discrete as possible.
Techniques used to make the amplification more discrete included growing hair longer, wearing transparent ear molds, choosing hearing aids that match the skin, and occasionally discontinued usage altogether. Furthermore, the study found a greater reluctance to use FM systems than in elementary school because of the increased visibility (which was listed as one possible reason). Similar findings were noted in Punch and Hyde (2011). Other possible reasons noted for this change were the impracticality of informing each teacher about the device, as well as the desire to be independent.

This could result in poor amplification outcomes, as Kent and Smith (2006) reported that the adolescents with hearing loss who were accepted into their peer groups, and who experienced accepting attitudes amongst their family members, were the ones who were most likely to perceive their hearing aids as ‘normal’, and thus comply with appropriate usage. Supporting these findings, Winn (2006) noted that in a group of individuals with congenital hearing loss, hearing aid use declined significantly after elementary and high school. Furthermore, Elkayam and English (2003) found that adolescents expressed a fear of being judged negatively when wearing hearing aids, or when expressing difficulty with communication. The study also found that adolescents also had concerns about the physical discomfort of hearing aids, losing the expensive devices, the minimal benefit they offer those with mild hearing loss (and the fact that they do not restore normal hearing), and the questions they evoke from peers and others.
Transition to College and Employment

Much like the transition to adolescence, the transition to college presents a wide range of issues for individuals with hearing loss. In a qualitative review of issues regarding college readiness of individuals with hearing loss, Cawthon, Schoffstall, and Garberoglio (2014) suggest that effective academic transition is reliant upon both individual and institutional preparedness.

Individual Preparedness

Individuals with hearing loss face challenges across many realms regarding college preparation. Several studies note that individuals with hearing loss tend to graduate high school with fourth to seventh grade reading levels, indicating a lack of readiness for college. Moreover, even when controlling for language and reading variables, individuals with hearing loss still do not perform as well academically as do their normally hearing peers. (Cawthon et al. 2014; Qi & Mitchell 2011). Albertini, Kelly, and Matchett (2012) surveyed three incoming classes at the National Technical Institute for the Deaf, and found that, on average, students with hearing loss who were entering college scored lower than the national average in the areas of reading, writing, and mathematics. The study also found that students expressed relatively low confidence levels regarding academic factors such as time management, preparing for class, and motivation, all factors that correlated with low motivation to graduate and dropout rate.

Communication difficulties may further impede readiness for college for individuals with hearing loss. The presence of additional disabilities such as ADHD also
impact academic outcomes. Additionally, “soft skills” like self-advocacy were crucial to success in the university setting for individuals with hearing loss (Cawthon et al., 2014). Albertini et al. (2012) reported that students with hearing loss expressed high levels of confidence regarding their ability to obtain appropriate services and effectively communicate their assistive needs to other students as well as faculty.

**Institutional Preparedness**

Institutional preparedness, that is, the nature of the university itself, is key in ensuring the success of individuals with hearing loss. Although all academic institutions are legally required to provide accommodations for individuals with disabilities, practical implementation varies. The extent to which a given school is willing to comply has definitive impact on the likelihood of individuals with hearing loss to seek services (Cawthon et al., 2014).

Furthermore, in a study of seventy-two current and former Australian Queensland University students, Hyde et al. (2009) found that more than half of the students who reported hearing loss did not utilize the school’s support program for individuals with hearing loss. The authors suggest that this may be because those individuals who received no assistive support in high school have become accustomed to working without it, and may come to believe that they do not need the support. This is a crucial parameter when considering the issues that arise in transitioning to university. Interestingly, however, there have been mixed results on studies examining the effects of ease of obtaining accommodations on learning outcomes, with some indicating no significant difference (Cawthon et al., 2014).
Employment

Outside the realm of academia, individuals begin to face an array of challenges regarding employment. As mentioned earlier, these issues begin manifesting themselves in adolescence. Punch, Creed, and Hyde (2006) found that high school students with hearing loss were already becoming concerned about a number of factors relating to employment, such as people not understanding hearing loss and using the phone. Even the least frequently reported barrier correlating with hearing loss, “having to work in groups” was reported as a concern by roughly twenty five percent of individuals with hearing loss. Findings related to the transition to employment and the workforce are summarized below (Table 5).

Table 5. Summary of key papers examining the transition to employment and the workforce for individuals with hearing loss.

<table>
<thead>
<tr>
<th>Study</th>
<th>Participants</th>
<th>Variables</th>
<th>Key Findings</th>
</tr>
</thead>
</table>
| Punch, Creed, and Hyde (2005) | • 65 students with bilateral sensorineural hearing loss  
  ○ mean age= 16.58 years  
  ○ 12% utilized cochlear implants  
  ○ 85% utilized hearing aids  
  ○ 29% utilized FM systems  
  • 107 normally hearing individuals  
  ○ mean age= 16.04 | • career maturity and attitudes  
  • career behaviors  
  • career barriers | • individuals with hearing loss did not actually score lower on measurements of career maturity  
  • only significant difference noted in career readiness between control and variable groups was higher levels of career development knowledge in variable group |
| Winn (2006)            | • 60 congenitally deafened adults under the age of 50 who had attended special education programs | • hearing aid usage  
  • employment | • individuals with hearing aids were no less likely to be employed than those who did not, and did not make significantly less money. |
<p>| Furlonger (1998)       | • 26 students with career development |                           |                                                                              |</p>
<table>
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<tr>
<th>moderate to profound hearing loss selected from resource classes for students with hearing impairment</th>
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<tbody>
<tr>
<td>• 26 students with normal hearing, matched to students with hearing loss according to age, ethnicity, school, and academic ability</td>
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<tr>
<td>• age range 13 to 18</td>
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<tr>
<td>• vocational maturity</td>
</tr>
<tr>
<td>• hearing loss were significantly less likely than their hearing peers to be interested in jobs demanding high levels of empathetic, persuasive, and communication</td>
</tr>
<tr>
<td>• participants with hearing loss scored significantly lower than their normally hearing peers in areas relating to career planning and decision making, and availability of information relating to the work environment.</td>
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<th>Luft and Huff (2011)</th>
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<tr>
<td>• 53 middle and high school students in programs for deaf and hard of hearing individuals</td>
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<tr>
<td>• transitions to adult living</td>
</tr>
<tr>
<td>• transition readiness</td>
</tr>
<tr>
<td>• students with hearing loss were found to have substantial transition competence deficits; none of the participants reached more than 4 out of 6 recommended transition competence parameters recommended by standardized measures</td>
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<th>Cinamon, Most, and Michael (2008)</th>
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<tbody>
<tr>
<td>• 35 young adults with hearing loss</td>
</tr>
<tr>
<td>• 19 used spoken language</td>
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<tr>
<td>• 16 used spoken and sign language</td>
</tr>
<tr>
<td>• 66 young adults with normal hearing</td>
</tr>
<tr>
<td>• role salience (family and work roles)</td>
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<td>• anticipated work-family relations</td>
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<tr>
<td>• all subgroups reported that family roles were more important than working roles.</td>
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<tr>
<td>• deaf individuals reported higher levels of commitment to their working roles than did the other groups</td>
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<td>• deaf individuals were more likely</td>
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However, as noted in Punch, Creed, and Hyde (2005), individuals with hearing loss did not actually score lower on measurements of career maturity, a term which refers to “the readiness and ability of an individual to perform necessary career-related tasks and make informed, age-appropriate career decisions. In fact, the only significant difference noted in career readiness between the studied group of individuals with hearing loss and their normally hearing peers was that individuals with hearing loss had higher levels of career development knowledge. This finding may be due to the fact that these individuals were more likely to have guidance counselors or other specialized personnel providing them with helpful career information (Punch et al., 2005). Similarly, Winn (2006) found that individuals with hearing aids were no less likely to be employed than those who did not wear hearing aids, and did not make significantly less money.

Furlonger (1998) studied the career development and vocational maturity of twenty-six adolescents from New Zealand with moderately-severe to profound hearing loss, and compared these results to those of their normally hearing peers. The study utilized two prepared reliable measures: the Self-Directed Search (Keeling and Tuck, 1982), which examines vocational exploration, planning and assessment, as well as personality factors that relate to career, and the Career Development Inventory (Lokan, 1983), which measures aspects of career development such as planning, general knowledge of how careers develop, knowledge of factors relating to career decisions, and practical realities relating to the workforce.
The study found several notable differences between the participants with hearing loss and those without. Adolescents with hearing loss were significantly less likely than their hearing peers to be interested in jobs demanding high levels of empathetic, persuasive, and communication skills. The author of the study notes that although adolescents with hearing loss may, in fact, possess these skills, it is possible that they are specific to the Deaf community and not able to be generalized to careers in the hearing world at large. It is also possible that the participants did not have many role models with hearing loss who have jobs requiring the aforementioned skill sets, so although it may be possible for them to pursue those careers, this may not be obvious to them in their career planning. Similarly, the study found that the participants with hearing loss scored significantly lower than their normally hearing peers in areas relating to career planning and decision making, and availability of information relating to the work environment.

These findings further emphasize the notion that adolescents with hearing loss have limited exposure to and familiarity with work and career opportunities. These findings emphasize the importance of increased career education for individuals with hearing loss. Again, future research may show differences in these parameters for individuals with hearing loss who are in mainstreamed educational settings.

In a study relating to the aforementioned findings, Luft and Huff (2011) note that students with hearing loss in public schools may be less prepared for transitions to adult life than individuals with hearing loss in specialized or residential programs specifically targeted toward their population. Particularly in the wake of the Individuals With Disabilities Education Act of 2004, which requires individuals with disabilities to be given accommodations to ensure as much of a normative educational environment as
This study assessed the transition competency levels of fifty-three public middle and high school students with hearing loss, and found that none of the students fulfilled more than four of the six transition competence recommended by the Transition Competence Battery. This tool is an evidence-based measure that was developed specifically to assess the transition knowledge of individuals with hearing loss. The study found that individuals were particularly lacking in the areas of knowledge of money management. This category was the one in which students exhibited the least improvement of knowledge from middle to high school. Importantly, however, the study does not compare these skill awareness levels to individuals with hearing loss in specialized schools, or, for that matter, the general middle and high school age population at large.

Cinamon, Most, and Michael (2008) surveyed 101 Israeli participants ages twenty to thirty three, both with and without hearing loss, on a number of parameters relating to perspectives on family and work. Of the participants with hearing loss, nearly all of them wore hearing aids or cochlear implants, and utilized spoken language. The study referred to these individuals as hard of hearing. A subset of participants simultaneously used spoken and sign language, and for purposes of this study were referred to as a separate “deaf” category, although not necessarily affiliating themselves with the Israeli Deaf community.

The study found that all subgroups, hearing, hard of hearing, and deaf, all reported that family roles were more important than working roles. However, the deaf
individuals reported higher levels of commitment to their working roles than did the other groups. The authors of the study suggest that because communication is typically perceived as such a crucial factor in societal inclusion, perhaps those individuals with the weakest ability to communicate felt a stronger drive to succeed in the realm of employment, and thus attain societal acceptance.

Interestingly, the study found that deaf individuals were more likely than participants in the other subgroups to anticipate low levels of conflicts between work and family. The study suggests that this might be due to lack of exposure to the hearing world, and the nature of the workforce in general. The authors also suggest the possibility that given the nature of vocational limitations for deaf individuals, they anticipate less demanding jobs.

These composite findings might suggest a crucial component in preparing individuals with hearing loss for the workforce is counseling. That is, individuals may have the required objective skills needed to be successful in their careers, but need support regarding confidence and other “soft skills” mentioned previously. Work might also need to be done regarding social perceptions amongst the general population regarding individuals with hearing loss and their occupational capabilities.

A number of studies address the current transition services and programs that are currently available to assist individuals with hearing loss regarding these issues. In a comprehensive survey of current programming in the United States, Luft (2014) examined both educational and vocational components of existing transition programming in both residential and public school programs for individuals with hearing loss. Contrary to the suggestions mentioned previously, the survey did not find many
differences between residential and public schools regarding transition planning programming. Although residential programs did overall offer significantly more transition programs relating specifically to employment, they did not offer significantly more programming in other areas such as transition planning for secondary schooling, or offer more transition assessment services.

A noteworthy component of this study was the finding that transition programming tended to focus on shorter-term issues rather than more permanent ones. That is, even the programs that excelled at assisting students in immediate post-graduation life and perhaps securing a first job, fell short in the area of long term transition planning. This area includes matters like securing a job over an extended period, or the transitions involved in switching jobs, careers, or schools. This seems particularly problematic in light of the aforementioned research regarding the likelihood of individuals with hearing loss to drop out of school, and thus develop multiple transition needs even after the initial postsecondary choice of school.

**Summary and Conclusions**

The studies discussed in this paper emphasize the wide range of issues that face individuals with hearing loss as they face transitional periods throughout life. It is important to note that many of these studies consisted largely of qualitative measures like interviews or surveys. Although these measures may not provide data that can be quantified and generalized to wider populations, they collectively supply telling insights into relevant issues. Topics like isolation, communication, and acceptance were raised
multiple times throughout these studies, indicating that these are key concerns during transitional periods across multiple populations.

It should also be noted that many of the referenced studies were administered prior to the widespread usage of current technological advancements, most notably cochlear implants. Future research should focus on how the latest advancements in assistive technology can be utilized to address these problems. However, it is crucial to note that most of these studies also highlight the many strengths and skills inherent in the population of those with hearing loss. These assets must not be overlooked, both as professionals working with those with hearing loss, and as society at large. The findings here emphasize the importance of examining the specific circumstances of each transitioning child, adolescent, and adult with hearing loss. Continued research, patient centered care, and a comprehensive multidisciplinary approach will help encourage positive outcomes as individuals with hearing loss experience the challenges and rewards of transitioning throughout life’s stages.
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