Diagnosing and Treating Signed Language Disorders: A New Perspective

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The concept of disorders in signed language as a field of study has been mentioned briefly in signed language studies (e.g., Nover, Christensen, & Cheng, 1998; Quinto-Pozos, 2014a; Wix, 1993), but the notion of pursuing signed language treatment is still a novelty. Quinto-Pozos (2014a) suggested that this type of treatment is ripe for further investigation in the field of speech-language pathology. Reasons for the current lack of treatments might include that (a) not enough is known about speech-language pathologists’ (SLPs’) awareness/perceptions of signed language, (b) SLPs may not possess adequate signing skills to assess and treat signed language disorders, and/or (c) there is a lack of preparation provided by graduate programs in this field.

ABSTRACT: Purpose: This study surveyed graduate students of speech-language pathology to determine their awareness of signed language disorders, opening the door to a possible discussion of the need for signed language pathology, including the potential for future signing-based diagnoses and therapies. Method: Thirty-two graduate speech-language pathology students completed a questionnaire identifying (a) their attitudes toward the use of signed language, (b) their awareness of signed language disorders, (c) opportunities for treatment in signed language, and (d) a need for this type of training in graduate education. Results: The majority of the students recognized American Sign Language as a human language; however, respondents lacked prior knowledge of the existence of organic disorders that could impact the production of signed language. When informed about the existence of such disorders through the questionnaire, these students acknowledged a need for training regarding treatment to alleviate the disorders. Conclusion: Students in this speech-language pathology program, located in the same department as a Deaf Studies program teaching American Sign Language, were receptive to the use of signed language in treatment and saw value in pursuing additional education in signed language pathology in order to diagnose and treat signed language disorders.

KEY WORDS: signed language disorders, signed language pathology, perceptions, attitudes, training, treatment
Wix (1993) suggested that a new field of signed language pathology should be developed, parallel to speech-language pathology, where the focus is on the diagnosis and treatment of disorders affecting the production of signed language. Our article differs from other research in the field because it focuses on changing the attitudes of, and curricula for, the next generation of SLPs.

For purposes of our article, signed language is defined as a natural visual–gestural language sharing a wide range of linguistic properties with spoken languages, such as phonology, morphology, and syntax (Klima & Bellugi, 1979; Stokoe, 1960; Stokoe, Casterline, & Croneberg, 1965; Valli, Lucas, Mulrooney, & Villanueva, 2011; Wilbur, 1979), and the deaf community is defined as those individuals who use signed language as their primary mode of communication (e.g., Cripps & Supalla, 2012; Padden, 1980).

William Stokoe first investigated the linguistic properties of American Sign Language (ASL) as a human language in the 1960s (Maher, 1996) and determined that ASL met the definition of a full-fledged human language. Similar outcomes were found across a number of signed languages worldwide (e.g., British Sign Language, Indo-Pakistan Sign Language, Swedish Sign Language; Bergman & Wallin, 1990; Sutton-Spence & Woll, 1999; Zeshan, 2000).

For decades, the American Speech-Language-Hearing Association (ASHA; Joint Committee of ASHA and the Council on Education of the Deaf, 2004) has acknowledged the importance of using signed language with children who are deaf. One reference mentioned support of ASL as a small part of ASHA’s early intervention policy, but no specific policy could be found regarding the diagnosis or treatment of signed language disorders in any of ASHA’s publications (see Cripps, Cooper, Supalla, & Evitts, 2016).

Not surprisingly, there is a dearth of information exploring the relationship of speech-language pathology and signed language, and the information that does exist is often superficial or confusing. For example, when it comes to understanding the role of the SLP with signed language, Ferguson and Armstrong (2004) suggested that it is the SLP’s job to facilitate communication accessibility between professionals (e.g., doctors, teachers, etc.) and individuals who are deaf. In this capacity, the SLP’s role appears limited to advising professional colleagues to request signed language interpreters when needed.

Vold, Kinsella-Meier, and Hughes-Hilley (1990) created a signed language manual for audiologists and SLPs to use when conversing with deaf clients. The manual includes illustrations of signed vocabulary along with individual phonological descriptions of how to create signs. Chapters include sample sentences and dialogues used in clinical settings with both children and adults; matching illustrations are provided.

However, in our opinion, this manual (Vold et al., 1990) provides very limited opportunities for face-to-face communication with deaf individuals for several reasons. First, the vocabulary choices in the manual are limited. Second, the manual provides some rudimentary signs to use to communicate to a deaf person but does not provide any opportunity to learn receptive signing skills; that is, to practice understanding what the deaf person may be communicating in response to various questions. Third, most of the sample sentences in the manual are presented in English word order, which may not be understood by deaf people whose first language is ASL, which uses a significantly different grammar than English. Finally, this basic level of signed vocabulary does not provide anywhere near the depth of knowledge needed to diagnose disorders in the production of signed language.

More recently, Quinto-Pozos (2014b) edited a book that focuses on how disorders of signed language might be considered within the contexts of acquiring and using language, but not specifically on the remediation of acquired deficits. This article will briefly review studies concerning the existence of disorders that are commonly addressed by SLPs, such as aphasia, stuttering, and specific language impairment (SLI), and document how these disorders may appear in a signed language. Attitudes of SLPs toward a variety of populations other than deaf people will also be examined. The article will conclude with a description of our preliminary study examining the attitudes of speech-language pathology graduate students toward signed language and its potential disorders, with recommendations for future research.

Previous Research Studies of Signed Language and its Disorders

As evidenced by a plethora of professional journals in the field, there are a large number of research studies on speech and spoken language disorders. From the extensive body of research available, it is clear that people with spoken language disorders frequently seek speech and/or spoken language treatment. The pathology of signed language, on the other hand, has received little attention in the field of speech-language pathology, deaf education, ASL instruction, or any other field. Yet, several studies have identified signed language disorders involving aphasia, stuttering, and SLI (e.g., Bellugi, Klima, & Hickok, 2010; Corina, 1998; Cosyns, Van Herreweghe, Christiaens, & Van
Borsel, 2009; Hickok, Pickell, Klima, & Bellugi, 2009; Marshall, Denmark, & Morgan, 2006; Mason et al., 2010; Morgan, 2005; Morgan, Herman, & Woll, 2007; Quinto-Pozos, Forber-Pratt, & Singleton, 2011; Quinto-Pozos, 2014a; Snyder, 2009; Whitebread, 2004, 2014). Unfortunately, treatment for these disorders does not appear to have found its place in the literature of evidence-based practice.

Signed Language Aphasia Studies

Among the approximately 5,000 deaf survivors of stroke in the United States, approximately 1,000 of them have aphasia (see Salk Institute for Biological Studies, n.d.b., for more information related to this topic). An adapted version of the Boston Diagnostic Aphasia Examination was developed by the Salk Institute for use with deaf stroke patients using ASL (see Salk Institute for Biological Studies, n.d.a., for more information). Difficulties were identified in signed language production and comprehension among deaf individuals with aphasia with damage in their left cerebral hemisphere. As with disorders in spoken language, a number of deaf clients with aphasia who have damage in the Broca’s region may have difficulties in signed language production (e.g., Bellugi et al., 2010; Poizner, Klima, & Bellugi, 1987). Similar to the findings with the Broca’s region, deaf patients with left hemisphere damage in the Wernicke’s region (in the left brain, which is responsible for language comprehension) demonstrated difficulty with language comprehension (e.g., Bellugi et al., 2010; Hickok & Bellugi, 2010; Poizner et al., 1987). (See Emmorey, 2002, and Quinto-Pozos, 2014a, for a comprehensive review of recent studies on signers with aphasia.)

Signed language aphasia includes characteristics such as halting and effortful signed production, single-sign utterances, absence of syntactical and morphological markings, and disordered grammatical markings such as errors in spatialized markings (Hickok & Bellugi, 2001). Throughout their years of study with deaf people with aphasia, Bellugi, Hickok, and Klima (Bellugi et al., 2010; Hickok & Bellugi, 2001, 2010) identified the properties of aphasic signed language disorders. In these studies, signers with aphasia demonstrated language deficiency in the linguistic properties of ASL phonology, such as errors with handshape(s), location(s), and movement(s), when signing (Brentari, Poizner, & Kegl, 1995; Poizner et al., 1987); production errors with the sublexical, lexical, and sentence-level processes (e.g., Bellugi, Poizner, & Klima, 1989; Hickok & Bellugi, 2001; Hickok, Kritchевsky, Bellugi, & Klima, 1996; Hickok et al., 2009; Poizner et al., 1987); and poor comprehension when perceiving signed lexicons and sentences (e.g., Hickok, Love, Buchsbaum, & Bellugi, 2002; Hickok, Love-Geffen, & Klima, 2002).

These studies focusing on ASL provide a foundation of evidence for aphasia in the signed modality (see Bellugi et al., 2010; Hickok & Bellugi, 2001, 2010, for a literature review of additional properties in aphasic signed language disorders). However, no documentation, evidence-based practice, instruction manuals, or other guidance could be found to instruct professionals on how to provide signed language treatment for deaf individuals with aphasia. The Salk Institute’s Laboratory for Cognitive Neuroscience website video (n.d.a.) clearly states that no treatment is presently available for individuals with aphasia who sign.

Signed Stuttering Studies

To identify the characteristics of signed stuttering, Whitebread (2004) interviewed 10 Gallaudet University faculty members who were active in the deaf community and had experience interacting with people who demonstrated stuttering in ASL. As a result of these interviews, Whitebread proposed nine characteristics of signed stuttering: inconsistent interruptions in sign and fingerspelling, stuttered symptoms most often occurring at the initiation of a gesture, hesitation of sign movement, repetition of sign movement while keeping the original handshape, exaggerated signs or prolonged signs, unusual body movements completely unrelated to linguistic communication, poor fluidity of the sign, inappropriate muscular tension (in the arms and hands) associated with signing, and adding a schwa (gestures included before a sign that serve no storytelling meaning).

Later, Cosyns et al. (2009) refined the definition of signed stuttering as including manual repetitions, prolongations, blocks, choppy manipulations, jerky and hesitant signs, involuntary interjections, and extra movements, as found in natural signed languages around the world. Snyder (2009) speculated that signed stuttering in ASL exists as a disorder that is indicative of cognitive processing errors, be it in a signed or spoken modality.

Whitebread (2014) recently completed a literature review of several studies on stuttering among deaf people, identifying Voelker and Voelker’s (1937) study as the earliest. In reviewing the various articles, no data regarding the percentage of signers in the United States and Canada who stutter could be found. Additionally, no standardized assessment or treatment could be found for individuals who exhibited signed stuttering, even though some attempts have been made to remediate this disorder (e.g., Quinto-Pozos, 2014a).
Specific Signed Language Impairment (SSLI) Studies

SLI is an isolated linguistic problem that is found in children with atypical language development and no other obvious impairments. Symptoms of SLI include problems with phonology, morphology, syntax, semantics, pragmatics, or listening and expressing language (Leonard, 1998). Quinto-Pozos and colleagues (Quinto-Pozos et al., 2011, 2013; Quinto-Pozos, Singleton, Hauser, & Levine, 2014) conducted studies validating the existence of SLI in ASL users through interviews with professionals and a limited number of in-depth case studies. One case study (Quinto-Pozos et al., 2013) examined a native-signing deaf girl. Both linguistic and nonlinguistic (cognitive-motor, visual-spatial, and memory skills) instruments were used to determine the presence of atypical signed language development in ASL. Quinto-Pozos et al. (2013) identified the child as having difficulties with the spatial aspects of ASL (i.e., classifiers and referential shifting).

Summary of Previous Findings

Although some individualized treatments have been attempted, at this time, there are no standardized approaches to the diagnosis or treatment of any of these disorders (i.e., signed language aphasia, signed stuttering, and SSLI) and no known graduate programs, or standardized in-service training opportunities, for professionals to develop skill in providing signed language diagnosis and treatment using ASL.

Attitudes Toward Individuals With Speech-Language Disorders

It is important to acknowledge that the acceptance of ASL as a language has unquestionably increased since the 1980s, and use of the language has become more widespread (Cooper, 1997; Cooper, Reisman, & Watson, 2008, 2011; Quinto-Pozos, 2011; Rosen, 2008; Wilcox & Wilcox, 1997). As ASL becomes more entrenched in society as an acceptable alternative mode of communication, it is critical that communication professionals, including the next generation of SLPs, accept the emerging concept of signed language pathology.

The deaf community is a sociolinguistic phenomenon where deaf individuals use signed language and consider themselves part of a cultural and linguistic minority rather than a disability group (Charrow & Wilbur, 1989; Johnston & Erting, 1989; Padden, 1980; Reagan, 1985, 1995; Rutherford, 1988). Historically, people have held negative attitudes toward individuals with hearing loss and those who use signed language (e.g., Bauman, 2004; Eckert & Rowley, 2013; Humphries, 1977; Lane, 1999). In fact, Ralston, Zazove, and Gorenflo (1996) found that many professionals who provide services to the deaf community may hold negative attitudes toward this population.

Even in the field of communication disorders, studies have found that some SLPs demonstrate negative attitudes toward clients of culturally diverse populations (e.g., Robinson & Stockman, 2009). In their review of research regarding the perceptions of professionals such as teachers and vocational counselors, Bebout and Arthur (1992) indicated that these individuals were likely to have negative views of individuals with communication disorders. Bebout and Arthur administered a questionnaire to students of diverse ethnic and linguistic backgrounds from two university settings to elicit their perceptions concerning different types of spoken language disorders. University students born outside the United States tended to demonstrate negative views toward people with spoken language disorders. Based on these findings, Bebout and Arthur suggested that SLPs’ attitudes toward their clients could be impacted by cultural differences. Thus, SLPs’ self-awareness of possible cultural attitudes and biases regarding their service population could enable them to cope more efficiently with problems arising from differences between their belief systems and those of their clients.

In a related study, Robinson and Stockman (2009) examined SLPs’ perceptions of a minority group using African American English (AAE) dialect. Robinson and Stockman used spoken samples of AAE and asked SLPs to rate the speech of AAE speakers with different levels of dialect density. The authors found that SLPs in the study did not have experience with AAE and were unfamiliar with the grammar rules of AAE. They concluded that the SLP raters’ lack of knowledge in AAE resulted in their rating the AAE speakers as being less intelligible than people who speak standard English.

Data have also been collected regarding teachers’ attitudes toward AAE speakers. Survey results from Blake and Cutler (2003) found that the majority of teachers in New York public schools had positive attitudes toward AAE speakers. Unlike in the Robinson and Stockman (2009) study, in the Blake and Cutler study, sensitivity to students who use AAE as their primary language was evident in the responses from urban teachers. Whereas many of the participants in the Robinson and Stockman study indicated negative attitudes toward AAE, only 14% of the teachers in the Blake and Cutler study considered AAE as a lazy form of English. Likewise, Fogel and Ehri (2006) assessed the impact of attitudes toward AAE speakers in classroom teachers who had received training regarding the rules of AAE. They administered a survey...
to teachers before and after the training in order to obtain the teachers’ perceptions of the structure and usefulness of AAE. The outcome of the study indicated that the teachers improved their attitudes toward AAE speakers through training, moving from slightly negative to neutral. However, there were no correlations between knowledge and attitude after training, which suggests that learning the rules of AAE is not enough to change one’s attitude toward AAE speakers.

In response to these concerns, Blackburn (2012) conducted a study based on previous research on AAE dialect features and attitudes toward AAE speakers (Blake & Cutler, 2003; Fogel & Ehri, 2006). The sample included 63 undergraduate students majoring in speech-language pathology who were enrolled in a Phonetics of American English course in which they learned about AAE through the techniques of Fogel and Ehri’s (2006) dialect instruction model. Using a pretest/posttest format, results indicated that the students significantly improved their knowledge of the phonological and grammatical features of AAE as well as changed their attitudes toward clients who use AAE in schools.

The findings in Blackburn’s (2012) study suggest that speech-language pathology students can improve their knowledge of AAE through explicit instruction on its features (i.e., phonology and grammar) and can change their attitudes toward AAE speakers in their clinical practices. Blackburn’s findings have significant implications for SLPs who work with diverse groups, such as deaf people who sign. These results might be generalized to suggest that with more instruction, exposure, and practice, the attitudes of SLPs toward people who sign, with or without signed language disorders, could also be changed in a positive direction. Although no research could be found investigating the attitudes of SLPs toward the existence of signed language disorders, one purpose of this article was to open the discussion about attitudes toward deaf people who use signed language.

The Preliminary Study

In an effort to predict future attitudes of SLPs toward deaf people, signed language, and signed language disorders, this study targeted graduate students who were likely to become speech-language pathology experts working with people with speech and language disorders. The objectives of the study were to determine if these graduate students (a) were receptive to signed language in general, (b) would acknowledge that there are signed language disorders, (c) have any special training for treatment in signed language, or (d) see a need for this type of training in their graduate education.

METHOD

Questionnaire Development

The online questionnaire, titled “Speech-Language Pathologists’ Perspectives on American Sign Language,” was adapted from one by Evitts, Kopf, and Kauffman (2014) and consisted of various styles of questions (see the Appendix). Some of these were Likert-scale questions with six possible responses (e.g., strongly agree to strongly disagree, or prefer not to respond). Participants were invited to add comments in addition to answering the survey items. The questions were modified to fit the topic of attitudes toward signed language disorders. The questions were designed to obtain participants’ (a) general demographic information (including actual clinical experience); (b) perception, awareness, and knowledge of ASL and signed language disorders (i.e., aphasia, stuttering, and SLI); (c) any training or course work related to ASL; and (d) any experience treating language disorders in individuals who are deaf.

Participants and Procedure

The questionnaire was distributed to graduate students in their first or second year of the speech-language pathology program at a large university in the mid-Atlantic region via a listserv email that included a link to the campus lab’s online survey system (www.studentvoice.com). The graduate speech-language pathology students shared classroom space with students in the Deaf Studies program, the latter offering ASL for credit. The Department of Audiology, Speech-Language Pathology, and Deaf Studies includes two graduate programs (a master’s in speech-language pathology and a clinical doctorate in audiology) and two undergraduate programs (bachelor’s degrees in speech-language pathology/audiology and Deaf Studies). Responses were gathered during a 2-week time period in the spring semester of 2012. The online survey system provided an electronic compilation of results. Descriptive statistics were used to describe the results through the use of percentages. Participants’ comments from the open-ended questions in the questionnaire were summarized.

RESULTS

Demographics

The questionnaire was sent to 85 first- and second-year graduate students in the speech-language pathology program. The response rate was 44.7% (n = 38).
Two responses were excluded because the participants were already certified SLPs and the intention of the study was to target graduate students who were still in training and could become educated in this area. Of the remaining 36, all of whom were female, 32 participants completed the questionnaire, and four participants left some items blank. Of the 36 participants, four (11.11%) identified themselves as working full time in the field of speech-language pathology, 16 (44.44%) identified as full-time graduate students, six (16.67%) indicated that they were employed part time (field not specified), and 10 (27.78%) identified themselves as unemployed. The four participants who indicated being employed full time worked in schools, hospitals, or other medical environments, and other work settings. Most of the participants had no experience working as an SLP (n =15, 45.45%), 12 indicated 1 year of experience (36.36%), six (18.18%) indicated 2 years of experience, and three failed to respond to the question.

Knowledge of ASL and the Deaf Community

Data describing the participants’ responses to questions about their knowledge of ASL and the deaf community are provided in Table 1. Of the 32 participants who answered questions within this category, only two were extremely or very familiar with ASL, less than half were moderately familiar, and more than half admitted that they were not very familiar or not at all familiar with ASL. Participants indicated that they had received their education about ASL and the deaf community through a variety of sources, with some of them indicating that they had received this training from more than one source (by checking off all of the ways that they had been exposed to ASL). Fourteen participants learned from dedicated course(s) on deaf culture and ASL in their undergraduate program; 11 from a mixture of undergraduate courses; one from a dedicated course(s) in graduate school; five from a mixture of graduate courses; two from clinical

| Table 1. Participants’ knowledge of American Sign Language (ASL) and the Deaf community. |
|---------------------------------------------|--------|------|
| **Question** | **n** | **%** |
| 1. How familiar are you with ASL? | | |
| Extremely familiar | 1 | 3.13 |
| Very familiar | 1 | 3.13 |
| Moderately familiar | 12 | 37.50 |
| Not very familiar | 16 | 50.00 |
| Not at all familiar | 2 | 6.25 |
| Prefer not to respond | 0 | 0 |
| 2. Where did you receive your education on people who are Deaf and use ASL? (Check all that apply) | | |
| Dedicated course(s) in undergraduate school | 14 | 43.75 |
| Mixture of courses in undergraduate school | 11 | 34.38 |
| Dedicated course(s) in graduate school | 1 | 3.13 |
| Mixture of courses in graduate school | 5 | 15.63 |
| Clinical practicum | 2 | 6.25 |
| Continuing education opportunities | 1 | 3.13 |
| Deaf family members | 1 | 3.13 |
| Deaf friends, neighbors, coworkers, etc. | 1 | 3.13 |
| Other | | |
| Undergraduate research | 1 | 3.13 |
| N/A or none | 4 | 12.50 |
| 3. Please indicate your level of agreement with the following statement: ASL should be treated equally as one of the human languages. | | |
| Strongly agree | 24 | 75.00 |
| Moderately agree | 6 | 18.75 |
| Neither agree nor disagree | 0 | 0 |
| Moderately disagree | 2 | 6.25 |
| Strongly disagree | 0 | 0 |
| Prefer not to respond | 0 | 0 |
practicum experiences; one from continuing education opportunities; one from deaf family members; one from deaf friends, neighbors, coworkers, and so on; one from undergraduate research; and four had no education regarding people who are deaf and use ASL. When asked to select their level of agreement with the statement that ASL should be treated equally as one of the human languages, almost all (94%) of the participants agreed; two moderately disagreed.

Knowledge of Language Disorders in ASL

Table 2 provides data regarding the participants’ knowledge of spoken language disorders and signed language disorders. Three-quarters of the participants were familiar with the concept of SLI (the questionnaire did not ask specifically about this relative to spoken or signed mode). Only four participants indicated that they knew of signed language aphasia, only one participant knew of signed stuttering, and eight had not heard of any of these disorders, be it in spoken or ASL users. When posed with the statement that deaf persons who have language disorders can benefit from treatment in ASL, almost all (94%) of the participants agreed; two moderately disagreed.

Personal Experience, Training, and Self-Assessment

Table 3 provides data regarding the participants’ personal experiences of working with deaf people or people with hearing loss and self-assessments of their signed language skills. Less than half of the 36 participants indicated that they had practiced speech-language pathology with individuals with hearing loss; more than half acknowledged that they had not. When asked if they had practiced speech-language pathology with individuals who are deaf and use ASL, four of the participants did not respond, three responded affirmatively, and 29 responded that they had not. Only two of the three participants who responded affirmatively provided the ages of the clients with whom they had worked. One participant indicated that she had worked with more than 50 individuals who were deaf and used ASL from ages 0 to 65+, and one participant indicated that she had worked with fewer than 10 individuals, all in the 0 to 5 age category.

When asked whether they felt they had the appropriate training needed to treat disorders using ASL, 91% of the participants stated that they felt unprepared to treat people with signed language disorders who sign. When asked whether they felt they had the expertise needed to assess and treat deaf people with signed language disorders, almost all (92%) of the participants felt that they did not. Approximately one-third of the 32 participants indicated that they had specialty training for SLI, and one indicated specialty training for cognitive-linguistic disorders; the remaining two-thirds of the participants did not have any specialty training in these areas.

Open-Ended Questions

The questionnaire invited additional comments and suggestions, specifically regarding training for and working with deaf people who sign and have signed
Table 3. Participants' personal experience, training, and self-assessment.

<table>
<thead>
<tr>
<th>Question</th>
<th>n</th>
<th>%</th>
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<tbody>
<tr>
<td>1. Do you have experience practicing speech-language pathology with individuals with hearing loss?</td>
<td></td>
<td></td>
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<tr>
<td>Yes</td>
<td>15</td>
<td>41.67</td>
</tr>
<tr>
<td>No</td>
<td>21</td>
<td>58.33</td>
</tr>
<tr>
<td>2. Have you practiced speech-language pathology with individuals who are Deaf and who use ASL?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
<td>9.38</td>
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<tr>
<td>No</td>
<td>29</td>
<td>90.63</td>
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<tr>
<td>3. Please indicate your level of agreement with the following statements: I have the appropriate training needed to treat disorders using ASL.</td>
<td></td>
<td></td>
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<tr>
<td>Strongly agree</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Moderately agree</td>
<td>1</td>
<td>3.13</td>
</tr>
<tr>
<td>Neither agree nor disagree</td>
<td>1</td>
<td>3.13</td>
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<tr>
<td>Moderately disagree</td>
<td>8</td>
<td>25.00</td>
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<tr>
<td>Strongly disagree</td>
<td>21</td>
<td>65.63</td>
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<tr>
<td>Prefer not to respond</td>
<td>1</td>
<td>3.13</td>
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<tr>
<td>4. Please indicate your level of agreement with the following statements: I have the expertise to assess and treat people who are Deaf with ASL disorders.</td>
<td></td>
<td></td>
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<tr>
<td>Strongly agree</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Moderately agree</td>
<td>1</td>
<td>3.13</td>
</tr>
<tr>
<td>Neither agree nor disagree</td>
<td>2</td>
<td>6.25</td>
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<tr>
<td>Moderately disagree</td>
<td>6</td>
<td>18.75</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>23</td>
<td>71.88</td>
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<tr>
<td>Prefer not to respond</td>
<td>0</td>
<td>0.00</td>
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<tr>
<td>5. In which of the following areas do you have specialty training? (Check all that apply)</td>
<td></td>
<td></td>
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<tr>
<td>Signed language aphasia</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Signed stuttering</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Specific language impairment</td>
<td>10</td>
<td>31.25</td>
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<tr>
<td>Other: Cognitive-linguistic disorders</td>
<td>1</td>
<td>3.13</td>
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<tr>
<td>None of the above</td>
<td>22</td>
<td>68.75</td>
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<td>6. For how many years have you been working with individuals who are Deaf and use ASL? (Please enter a number only)</td>
<td></td>
<td></td>
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<td>0 years</td>
<td>30</td>
<td>100.00</td>
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<tr>
<td>7. Approximately how many people who are Deaf have you treated for language disorders using ASL?</td>
<td></td>
<td></td>
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<tr>
<td>None</td>
<td>30</td>
<td>93.75</td>
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<tr>
<td>1–10</td>
<td>1</td>
<td>3.13</td>
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<tr>
<td>11–20</td>
<td>0</td>
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<td>21–30</td>
<td>0</td>
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<tr>
<td>31–40</td>
<td>0</td>
<td>0</td>
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<tr>
<td>41–50</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>More than 50</td>
<td>1</td>
<td>3.13</td>
</tr>
<tr>
<td>Prefer not to respond</td>
<td>0</td>
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language disorders. Five participants provided comments indicating that the survey opened their minds to new ideas and that now they would like to learn more about ASL and signed language disorders. When asked for additional comments or suggestions, three participants stated that more education about ASL and signed language disorders was needed at the undergraduate level, and five felt that this information should be included in graduate curricula in speech-language pathology. One participant regretted that her undergraduate program did not provide adequate training in ASL. One participant indicated interest in working with bilingual children who have English as a second language, acknowledging the benefits of providing bilingual treatment, regardless of the language, and including ASL as a language. One participant indicated that she had experience communicating in ASL previously and was eager to continue signing and applying this knowledge to her speech-language pathology practice. Several students indicated interest in learning, or continuing to learn, more about ASL. One participant provided her perspective that ASL was a dialect variance of Spoken English.

**DISCUSSION**

The purpose of this study was to survey graduate students of speech-language pathology to determine their awareness of signed language disorders, opening the door to a possible discussion of the need for signed language pathology, including the potential for future signing-based diagnoses and therapies. Three items emerged from this study. First, graduate students in this speech-language pathology program recognized ASL as a language. Second, graduate students in this speech-language pathology program were not sufficiently familiar with ASL and were therefore unaware of the existence of signed language disorders. Third, graduate students did not feel comfortable providing diagnoses and treatment to people who may have signed language disorders based on the students’ lack of knowledge in this area.

**ASL as a Language**

The fact that more than 90% of the participants perceived ASL as a human language is significant. The students participating in this study were not required to have any previous knowledge of ASL or the deaf community, but still acknowledged the existence of ASL as a language. It should be noted that this study occurred in a university where the speech-language pathology program is housed in the same department as an undergraduate Deaf Studies program, so there may be incidental exposure to signing and to deaf faculty in the building, friends taking or who have taken ASL classes, and more. Consequently, the participants were likely to have some awareness of ASL and deaf people due to the academic environment, with or without formal training. The incidental exposure to signed language found in this unique environment can be seen as a positive and realistic influence, leading to participants’ perception of ASL as an equal language.

**Familiarity With ASL and its Disorders**

Linguists have shown, and speech-language pathology students appear willing to accept, that ASL is indeed a language (Klima & Bellugi, 1979; Valli et al., 2011; Wilbur, 1979). Given that protocols exist for diagnosing and treating disorders in other languages, it appears to be a logical next step to identify and treat disorders in the production and reception of ASL. Preliminary studies in this area, cited in the literature review, indicate that these disorders exist. Notably, none of the participants in this study disagreed with the concept that deaf people who have signed language disorders could benefit from participating in treatment in ASL.

This small study coincides with the suggestion by Quinto-Pozos (2014a) that a new line of research in the area of signed language pathology and treatment is warranted, and that ASL pathology and treatment has the potential to become a field parallel to, or within, the field of speech-language pathology and treatment. For children who are deaf, use ASL as their primary mode of communication, and demonstrate signed language disorders, this type of treatment should become a priority. It should be noted that other groups of people could be impacted by this new field, notably children of deaf adults, ASL students in colleges and universities, and other signers (e.g., adult signers who might exhibit a signed fluency disorder or who suffer a stroke, and, in turn, possible aphasia). These individuals could also benefit from the availability of diagnosis and treatment to improve their signed communication skills.

**Diagnosing and Providing Treatment to Signers**

It is understandable that graduate students do not feel comfortable providing diagnoses and treatment to people who may have signed language disorders based on the students’ lack of knowledge of ASL or its possible disorders. When coupled with their acceptance of ASL as a language, and their dedication to the profession of improving human communication,
the goal of establishing diagnoses and therapies for signers seems imperative. Students need to look at their national professional association for guidance, and here is where the American Speech-Language-Hearing Association (ASHA) can be of help.

ASHA identifies its mission as empowering and supporting SLPs, audiologists, and speech-language, and hearing scientists by (a) advocating on behalf of persons with communication and related disorders, (b) advancing communication science, and (c) promoting effective human communication (www.asha.org). ASHA defines effective communication for deaf children as the ability to use language, such as signed language, effectively in a variety of sociocultural contexts (ASHA, 2004). With a mission of advocating for and enhancing the lives of people with communication disorders, ASHA has the opportunity to serve as a conduit in ameliorating signing disorders. Children, and other signers, are entitled to a signed language as a linguistic compensation for their hearing loss (Supalla & Cripps, 2008).

Limitations and Future Directions

The present study, while enlightening, has some limitations that could be rectified in follow-up studies. Any follow-up versions of this study should include clear examples of SSLI for those participants who are unfamiliar with the concept. The study could be repeated with a larger sample and with additional inferential statistical analyses. The proposed larger sample could include responses from groups of graduate students in speech-language pathology programs at universities where the use of signed language is pervasive compared to graduate speech-language pathology programs without any exposure to ASL. This study could include use of a pre/posttest format to examine the impact of providing awareness of and training on signed language disorders. Another suggestion for future research would be to survey speech-language pathology students in a setting without a Deaf Studies program on campus.

Additional research in this area could include a study of practicing professionals and how training in signed language disorders could be incorporated into continuing education. It may also be interesting to compare the attitudes of current SLPs with speech-language pathology students on this topic.

Another consideration, not discussed in this article, is for the scope of practice of SLPs to include the assessment of, and treatment for, deaf children who acquire signed language as their first language after the critical period of language learning (see Cripps et al., 2016, for further discussion on the issues about signed language delay in the field of speech-language pathology). Additionally, designated professionals must be identified within each educational system to assume responsibility for intervention in these cases (see Snoddon, 2008, for further information on ASL intervention).

Similar to the field of secondary education, where expertise in both a subject area and pedagogy is needed, this proposed new field will require a double expertise. In addition to an advanced level of language pathology skills, practitioners will need to have an advanced level of ASL skills that may require more than the typical 4 years of undergraduate training. A master’s degree in this field, or at least a track in a speech-language pathology program, should be developed. The speech-language pathology program could be developed with parallel tracks for deaf and hearing people wishing to pursue the field of signed language pathology, with courses focused on the diagnosis and treatment of signed language disorders. Any university with a Deaf Studies program and a speech-language pathology program could consider establishing this type of program. Gallaudet University, the world’s only liberal arts university dedicated to ensuring the intellectual and professional advancement of deaf individuals through ASL and English, has the potential to develop this type of program with its cadre of experts in ASL and speech-language pathology.

Conclusion

Results of this study suggest that professionals entering the field of enhancing interpersonal communication today are prepared to acknowledge the need for diagnoses and treatment plans for disorders of both spoken and signed languages, and the need for more investigation in this area.

The results of this study extend the preliminary findings of Quinto-Pozos et al. (2011), and even beyond the suggestion that the diagnosis and treatment of signed language disorders is a critical need in schools using signed language (Quinto-Pozos, 2014a). That is, this need exists across a much broader community, including a variety of adult signers and across a wide range of signing skills. There is also a need for this type of treatment to be standardized.

Overall, the current study suggests that the field of communication disorders, through the eyes of its incoming professionals, may be ready to broaden its perspectives to include the diagnosis and treatment of individuals with signed language disorders. If so, the field of preparing incoming professionals will need to expand, and emerging changes in attitudes and perceptions will likely open new doors for exciting future research and practice in signed language pathology.
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APPENDIX (p. 1 of 2). QUESTIONNAIRE

1. How familiar are you with American Sign Language (ASL)?
   - Extremely familiar
   - Very familiar
   - Moderately familiar
   - Not very familiar
   - Not at all familiar
   Prefer not to respond

2. Where did you receive your education on people who are Deaf and use ASL? (Check all that apply)
   - Dedicated course(s) in undergraduate school
   - Mixture of courses in undergraduate school
   - Dedicated course(s) in graduate school
   - Mixture of courses in graduate school
   - Clinical practicum
   - Continuing education opportunities
   - Deaf family members
   - Deaf friends, neighbors, coworkers, etc.
   - Other
   - Undergraduate research
   N/A or none

3. Which of the following language disorders are you aware of? (Check all that apply)
   - Signed language aphasia
   - Signed stuttering
   - Specific language impairment
   - None of the above

4. Please indicate your level of agreement with the following statement: Deaf persons who have language disorders can benefit from taking therapy in ASL.
   - Strongly agree
   - Moderately agree
   - Neither agree nor disagree
   - Moderately disagree
   - Strongly disagree
   Prefer not to respond

5. Please indicate your level of agreement with the following statement: ASL should be treated equally as one of the human languages.
   - Strongly agree
   - Moderately agree
   - Neither agree nor disagree
   - Moderately disagree
   - Strongly disagree
   Prefer not to respond

6. Do you have experience practicing speech-language pathology with individuals with hearing loss?
   - Yes
   - No

7. Have you practiced speech-language pathology with individuals who are deaf and who use ASL?
   - Yes
   - No

8. Please indicate your level of agreement with the following statement: I have the appropriate training needed to treat disorders using ASL.
   - Strongly agree
   - Moderately agree
   - Neither agree nor disagree
   - Moderately disagree
   - Strongly disagree
   Prefer not to respond

9. Please indicate your level of agreement with the following statement: I have the expertise to assess and treat people who are deaf with ASL disorders.
   - Strongly agree
   - Moderately agree
   - Neither agree nor disagree
   - Moderately disagree
   - Strongly disagree
   Prefer not to respond

10. In which of the following areas do you have specialty training? (Check all that apply)
    - Signed language aphasia
    - Signed stuttering
    - Specific language impairment
    - Other: Cognitive-linguistic disorders
    - None of the above
APPENDIX (p. 2 of 2). QUESTIONNAIRE

11. For how many years have you been working with individuals who are deaf and use ASL? (Please enter a number only)

12. Approximately how many people who are deaf have you treated for language disorders using ASL?
   - None
   - 1–10
   - 11–20
   - 21–30
   - 31–40
   - 41–50
   - More than 50
   - Prefer not to respond

13. Are there any other comments that you would like to share about people who are deaf who sign and/or have language disorders in ASL?

14. Do you have any additional comments or suggestions?
   - Yes (please explain)
   - No