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TRAINING AND KNOWLEDGE IN ADOLESCENTS WITH SPEECH AND LANGUAGE DISORDERS AMONG SPEECH-LANGUAGE PATHOLOGISTS: A SURVEY

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ABSTRACT

Research suggests that serving the adolescent population with speech and language disorders is unfamiliar to many speech-language pathologists due to the type of training they received during their graduate coursework and experiences. Survey methodology was used to explore the manner in which speech-language pathologists were prepared by their graduate level program to address speech and language issues in the adolescent population as well as their comfort level with treating this population. Results from this study revealed that speech-language pathologists who work in the public school system report such options as on-the-job training and use of colleagues as resources as more beneficial for preparing them to adequately serve this population than their graduate program. While a majority of respondents report feeling confident in their abilities to serve adolescents with speech and language impairments, the statistics did not show a significant difference between those who responded they did feel confident versus those who were not confident.

KEY WORDS

Adolescents, Training,
Speech and Language Disorders

INTRODUCTION

Speech-language pathologists who work in the public school system are faced with demanding and time consuming caseloads. In any single day, they serve children in special and regular education environments and provide services to children of all disabilities, ages, and academic levels sometimes in several locations (Schetz & Billingsley, 1992). Rosa-Lugo, Rivera, and McKeown (1998) addressed these expanding responsibilities: "As a result of IDEA, the role and scope of speech-language pathologists working in public school settings have also changed considerably. Not only do they serve substantially more children with communication disorders across age groups and grade levels, but they also serve more children with greater disabilities and severities" (p. 233).

Blood, Ridenour, Thomas, Qualls, and Hammer (2002) reiterated this sentiment by suggesting that earlier identification of children with communication disabilities and increased recognition of the needs of children with multiple and co-occurring disabilities have resulted in larger and oversized caseloads, greater time demands, and additional responsibilities for speech-language pathologists. York (2006), a speech-language pathologist in Houston, TX, added the following comments: "The Individuals with Disabilities Education Act (IDEA) and No Child Left Behind (NCLB) mandates increased the roles and responsibilities of speech-language pathologists, including accountability expectations for academic achievement in the general education classroom. On the individual front, we also must meet the individual needs of our diverse and complex student population" (p. 6).

With often increased caseloads, extra responsibilities required by federal and state regulations, and shortages of speech-language pathologists in some areas, what is the impact of treating middle and high school aged children with speech, language, fluency, voice, and/or cognitive delays on speech-language pathologists' already inundated caseloads and workloads, especially when follow-up studies have found that language impaired children continue to demonstrate language difficulties into adulthood (Aram, Ekelman, & Nation, 1984; Aram & Hall, 1989; Befi-Lopes & Rodriques, 2005; Beitchman et al., 1994; Enderby & Emerson, 1995; Johnson et al., 1999; King, Jones, & Lasky, 1982; Snowling, Adams, Bishop, & Stothard, 2001; Stothard, Snowling, Bishop, Chipchase, & Kaplan, 1998).

Larson and McKinley (2003) stated, "Intervention with older students who have communication disorders is paramount for their survival at school, at home, and in the community" (p. 289). These researchers suggested that adolescents with language disorders need to continue speech-language intervention to learn higher level concepts and vocabulary that are required for each grade transition. Many of these students require special services to remain in the regular education classes in the elementary years, and this need does not end when they enter the higher grade levels. Furthermore, if teaching the needed vocabulary and language skills is delegated to teachers, the focus will be on academic language rather than on social and vocational language. Moreover, these same educators are expected to teach the needed content in restricted time frames to large groups of students with varied needs. The speech-language pathologist may be the only professional in contact with these students who is concerned primarily with communication, and using academic, social, and vocational content to achieve speaking, listening, reading, writing, and thinking goals.

Larson and McKinley (2003) summarized these concepts as follows: "Appropriate intervention that teaches older students communication skills for academic, social, and vocational situations is the key to their ability to "fit" into society--to function as family members, lifelong learners, citizens, participants in leisure, and as consumers and producers of goods and services (p. 291)."

Whereas Larson, McKinley, & Boley (1993) and Larson and McKinley (2003) stressed the need and the importance of continued language intervention through the adolescent years, other authors have discussed the challenges that are related to treating this population, especially in regards to training.

McKinley and Lord-Larson (1985) noted that training programs in communication disorders put little emphasis on training professionals to work with the adolescent population. Ehren and Lenz (1989) stated, "Despite an expanding body of knowledge in adolescent language disorders, serving the adolescent population continues to pose many problems for the speech-language pathologist" (p. 192). Miller (1989) further believed that speech-language pathologists are not adequately trained to treat the adolescent population because most training programs put very little emphasis on school- or classroom-based service but rather focus on a clinical or medical model, in which clients are seen individually in isolated therapy rooms. Magnotta (1991) reiterated this sentiment by indicating that one barrier to implementing classroom-based interventions may stem from speech-language pathologists' traditional training in medical models rather than educational ones.

Ehren (2002) noted, "Providing services to adolescents in middle, junior, and high schools continues to be a major challenge in the schools and a critical concern to professionals who understand the needs of students in this age range" (p. 62). These challenges include that (a) some speech-language pathologists do not feel comfortable serving the adolescent population because they are not familiar with secondary schools; (b) adolescents are often reluctant to participate in therapy; (c) making language intervention relevant at the secondary level is challenging due to a more diverse setting and more difficult curriculum content; and (d) services become limited at the secondary level, thus, encouraging speech-language pathologists to dismiss children with a language disorder after elementary school. Whitmire (2002) added that traditional university-based clinics do not provide adequate experience with current service

delivery models. Whitmire and Eger (2003) further noted that the majority of graduate programs in speech-language pathology are training speech-language pathologists to be generalists in the field of communication disorders rather than specialists in working in the school settings. Larson and McKinley (2003) stated, "One of our premises is that older students remain unserved or underserved, in part, because speech-language pathologists have not learned how to provide effective services to them" (pp. 430-431). They summarized their thinking as follows: "Whatever the explanation, many students majoring in communication sciences and disorders are not receiving the curriculum to prepare them to work with adolescents in junior and senior high schools, juvenile detention centers, prisons, graduate equivalency degree (GED) programs, and academic skills resource centers for marginal students in vocational-technical institutes, colleges, and universities. Too often, graduates are ill-prepared for these jobs" (p. 432).

Whitmire and Eger (2003) further reiterated that most graduate education programs do not include specific content on school-related roles and tasks such as (a) curriculum-based assessment, (b) development and implementation of educationally-relevant intervention plans, and (c) implementation of specially designed instruction to remediate or circumvent severe language problems in the classroom. These challenges documented by the above authors seem to contradict the sentiment expressed by ASHA (2004) that states: "Intervention may be conducted in a variety of settings, including regular or special education classes or in individual/group treatment outside the classroom/workplace setting, selected on the basis of intervention goals and in consideration of the social, academic and/or vocational activities that are relevant to or desired by the individual," as well as ASHA (2010), which states: "SLPs provide appropriate speech-language services in Pre-K, elementary, middle, junior high, and high schools with no school level underserved." It appears as if decisions based on service delivery are being made based on clinical experiences and exposure in traditional, university-based graduate clinics rather than other, more appropriate factors.

Even though ASHA was suggesting that the profession of speech-language pathology was shifting from traditional "pull-out" approaches to more collaborative, inclusive models as early as 1996 (ASHA, 1996), as noted above, many researchers have continued to note the limitations in the preparation of graduate students for working with adolescents with speech and language disorders as well as for implementing more collaborative service delivery models. Due to lack of training in their graduate program, speech-language pathologists must "learn on the job" when considering service delivery options for adolescents with speech and language disorders. However, the difficulties associated with on-the-job training in school-specific skills are exacerbated by the fact that many school systems have professionals from other fields supervising speech-language pathologists. Only 23% of respondents to 2000 Schools Survey, administered by ASHA (2001) researchers, reported being supervised by a speech-language pathology supervisor. If a speech-language supervisor is not available to assist with proper mentoring of a new staff member, school specific content is never learned.

Other researchers have provided information about perceived level of competency when working with the adolescent population as well as information regarding graduate programs' views on treating this population. Campbell and Taylor (1992) surveyed 713 master's-level ASHA-certified speech-language pathologists, 61% of which were employed in the public school setting, regarding their perceived level of competency in 32 skills grouped into the following four areas: (a) evaluation of service populations, (b) treatment of service populations, (c) general skills, and (d) administrative skills. The authors suggested that one of the probable areas of discrepancy among clinical training, clinical certification, and professional needs in speech-language pathology and perceived competence would be in the area of service delivery to adolescents. However, results of the survey revealed that speech-language pathologists reported feeling competent to evaluate and treat non-neurological disorders in adolescents. Furthermore, treatment of non-neurological disorders in the adolescent population was rated 6th out of 10 skills with the highest ratings for perceived competency.

Larson and McKinley (2003) surveyed all the programs in communication disorders in the United States by sending questionnaires to department chairs in 1995 and in 2002. Results from the 1995 survey indicated that university personnel expected their students to interact clinically with adolescents but did not consistently provide them with necessary information on this population. Fifty-one percent of the respondents provided specific course content on adolescent communication disorders, whereas 58% of the respondents deemed it necessary to train students specifically in assessment and treatment of this population.

Results from the 2002 survey indicated that 86% of the programs reported providing specific course content on adolescent communication disorders. Furthermore, 93% of the respondents believed that it was important to train students specifically in assessment and intervention of adolescents. Even with the increases in training offered and acknowledgement of the importance of this training, Larson and McKinley (2003) summarized the findings as follows: "Despite our most fervent efforts for the last 20 years, it remains a challenge to appropriately prepare students for serving the older student population" (p. 432).

Whitmire and Eger (2003) verified this weakness of preparing graduate students for the demands of the school setting. These researchers surveyed 20 speech-language pathologists who were certified by ASHA. On average, these speech-language pathologists had 23 years of professional speech-language experience and had supervised 8.6 graduate student clinicians

from three universities over 5 years. Results from the survey indicated that 74% of the graduate clinicians were adequately to well prepared to apply academic information to the school setting. However, on more school specific information, such as defining a set of procedures for informal curriculum-based and authentic assessments, only 47% of the graduate clinicians were rated as adequately prepared and none were rated as well prepared. Furthermore, 86% of student clinicians were rated adequately to well prepared in applying academic information to the school setting in the area of individual or small group therapy. However, only 35% of these same student clinicians were rated as being able to adequately apply academic information in the school setting in the area of classroom therapy or consultation with the education team.

The education of speech-language pathologists is provided by many colleges and universities at the master's and doctoral level and consists of academic coursework, clinical education, and supervised experience (Battle, 2006). In fact, according to the 2000-2001 demographic survey conducted by the Council of Academic Programs in Communication Sciences and Disorders, there are 234 undergraduate programs and 244 master's degree programs in speech-language pathology (Shinn, Goldberg, Kimelman, & Mesick, 2001). The supervised practicum must include experience with client populations across the life span and from culturally and linguistically diverse backgrounds and with various types and severities of communication and related disorders, differences, and disabilities.

Whitmire and Eger (2003) advised that preparation for speech-language pathologists to work with the adolescent population must include the following components: (a) knowledge of curriculum and instruction, (b) skills in professional collaboration in planning and providing services, (c) training in strategies and techniques for working in educational settings, and (d) supervised experiences in general education settings. This study explores whether the current clinical experiences of graduate school adequately prepare future speech-language pathologists to work with adolescents with speech and/or language impairments as well as whether or not future speech-language pathologists feel confident in their abilities to adequately assess and treat this population.

METHOD

This study was designed to determine the coursework and clinical experiences provided by master's level programs in communication sciences and disorders in the area of service delivery for the adolescent population with speech and language disorders as reported by speech-language pathologists who are currently working in the Virginia's public school systems. Speech-language pathologists' perceived confidence level when working with this population was also explored.

Survey methodology was used as the basis for data collection. This survey was a researcher-developed, 30-question instrument designed to address the type of preparation speech-language pathologists received from their graduate program in the area of adolescent language disorders. According to Nardi (2003), survey research inherently lends itself to problems with validity because surveys may be artificial in nature. Individuals' genuine feelings are difficult to grasp in terms of such dichotomies such as agree or disagree, support or oppose, like or dislike. These terms are only estimated indicators of what researchers have in mind when they generate the questions. Reliability, on the other hand, tends to be strong when using survey research.

Even though some of the content included in the survey was also explored in Larson and McKinley's 1995 survey and various surveys reported by ASHA discussed in the literature review, reliability of the survey created for this study cannot be predicted at this time. No prior studies have established its reliability and validity (Creswell, 2003; Rudestam & Newton, 2001). Therefore, it was pilot tested before distribution. Five speech-language pathologists, who met the same criteria as the participants, but who were not participants in the study, judged the survey for comprehensiveness, relevancy, and clarity. Based on recommendations provided by pilot study participants, modifications were made to the survey to provide clearer survey text, structure, content, and presentation.

The survey included four sections. Section 1 included nine questions pertaining to speech-language pathologists' educational history, employment settings, credentials, years of experience, years of experience with the adolescent population, and caseload characteristics. Section 2 included 12 questions pertaining to the type and extent of training these speech-language pathologists had been exposed to regarding the adolescent population. Section 3 included seven questions pertaining to the type of service delivery models used while serving the adolescent population with language impairments and questions regarding the overall perception of benefit from these services. Section 4 addressed dismissal criteria for these students and contained two questions. The format included multiple choice questions, checklists, questions that required respondents to rank various options from the most important to the least important, yes-no, and open-ended questions.

As suggested by several researchers (Becker, Cookston, & Kulberg, 2000; Fox, Crask, & Kim, 1988; Haggett & Mitchell, 1994; Mehta & Sivadas, 1995; Murphy, Daley, & Dalenberg, 1991; Sheehan & McMillan, 1999; Taylor & Lynn, 1998), a respondent pre-notification e-mail was sent to the speech-language pathologists who were identified by searching ASHA's membership directory as working in the secondary setting of the public school. Their e-mail addresses were obtained from the ASHA Web site by searching for members who work in secondary schools in Virginia. This initial e-mail informed these professionals of the nature and purpose of the study and the date the survey would be released. The survey was then e-mailed to all of the speech-language pathologists who were identified as working in the secondary school setting by searching ASHA's

membership directory. An attached cover letter explaining the nature and purpose of the study accompanied this survey. Although complete anonymity could not be assured because returned e-mails often include the name of the sender and the e-mail address, participants were assured that their personal information would remain confidential.

Furthermore, as the surveys were returned to the researcher by e-mail, they were printed out and filed so that the data was separated from the sender and could be analyzed and reported anonymously. All of this information was explained in the cover letter that accompanied the survey. The researcher sent the survey and then sent follow-up e-mails a week after the initial distribution of the survey. A duplicate copy of the survey was sent with this follow-up e-mail (Bergk, Gasse, Schnell, & Haefeli, 2005; Dillman, 1983; Futrell & Lamb, 1981; Heberlein & Baumgartner, 1981). If no response had been received following one month after the initial sending of the survey, non-respondents were contacted a final time by e-mail. Following the final distribution of the survey, the researcher allowed 2 more weeks for participants to complete the survey. The researcher then reviewed and organized the data in frequency tables and graphs as appropriate. Narrative analysis was used for open-ended questions.

In total, this study included 196 participants. Participants' contact information was gathered by searching ASHA's membership directory using the following parameters: Virginia zip codes and secondary school work setting. This search provided 596 possible participants. Following the pre-notification letter and three survey distributions, 123 e-mails were returned indicating delivery failure, 183 subjects indicated that they did not meet the survey's participant criteria, and 94 subjects indicated that they did not wish to participate in the study. The overall response rate for this study was 30% (N = 59). Graduation years from a master's program ranged from 1969 to 2007, with 11 participants failing to indicate their year of graduation. Furthermore, 32 of the 62 respondents (52%) graduated from a program in the state of Virginia. When asked about the number of years the participants had worked with the adolescent population in the public school system, the majority indicated their experience ranged from 12-18 years (34%). However, 48% of respondents indicated that their current caseload included 0-10 adolescents while 35% reported that they spent 0-15% of their time working with the adolescent population.

On several surveys, respondents failed to answer questions or did not follow the specific instructions for that question. Rather than eliminate the entire survey from analysis, if a respondent did not accurately answer a question, data for that question was not included in item analysis.

Questions contained within the survey utilized for this study included yes/no responses, rank order, open-ended, and agree/disagree options. Questions requiring a "yes" or "no" response are considered binary response variables. The average value of a binary response variable in a population is the proportion of members of the population that are classified as "yes" (Crawley, 2007). The proportion of "yes" responses in the population is represented by the symbol π and is called the population proportion. If the population is hypothetical, it is more common to refer to it as probability of a "yes" response. If $\{Y_1, Y_2, \ldots, Y_n\}$ is a random sample from a population of binary response variables, the sum of these binary responses is a count of the number of subjects for which an answer is "Yes"(Y=1). From a moderate sample size, test statistics can be constructed to test whether the proportion of "Yes" answer is significant or not (Crawley, 2007). In this study, the population is a hypothetical population of the speech-language pathologists in the state of Virginia who work in the public school setting with adolescent students with speech and/or language disorders, and our sample is the surveyed sample of speech-language pathologists.

RESULTS

Section 2 of the survey, which contained 12 items, addressed the training speech-language pathologists received during their graduate coursework. First, respondents were asked what formal coursework they were exposed to during completion of their degree program that related to adolescent development and adolescent communication disorders. Figure 1 provides a graphical representation of these data.

Six additional questions in section 2 of the survey further addressed the coursework and experience provided by master's programs. When asked if the respondents' program provided specific course(s) on adolescent communication development, 88% of respondents answered "no". When asked if the respondents' program provided specific course(s) on communication disorders in adolescents, 86% responded "no". When asked if the respondents' programs provided specific course content on adolescent development, such as information on adolescent development contained within a broader course, 57% of the respondents answered "yes". When asked if the respondents' program provided specific course content on communication disorders in adolescents, such as information on adolescent communication disorders contained within a broader course, 63% responded "yes". When asked if the respondents were assigned to a clinical placement that allowed them the opportunity to assess and remediate adolescents with communication disorders, 56% of the respondents answered "yes". When asked if their graduate program adequately trained the respondents to work with the adolescent population, 52% responded "yes".

The answers to these questions are tabulated in Figure 1 and tested by the above mentioned hypothesis testing of binary responses. From the p-value represented in the data included in Table 1, it can be concluded that there is sufficient evidence to believe that there are significantly more "No" responses for "*Did your program provide specific course(s) on adolescent*

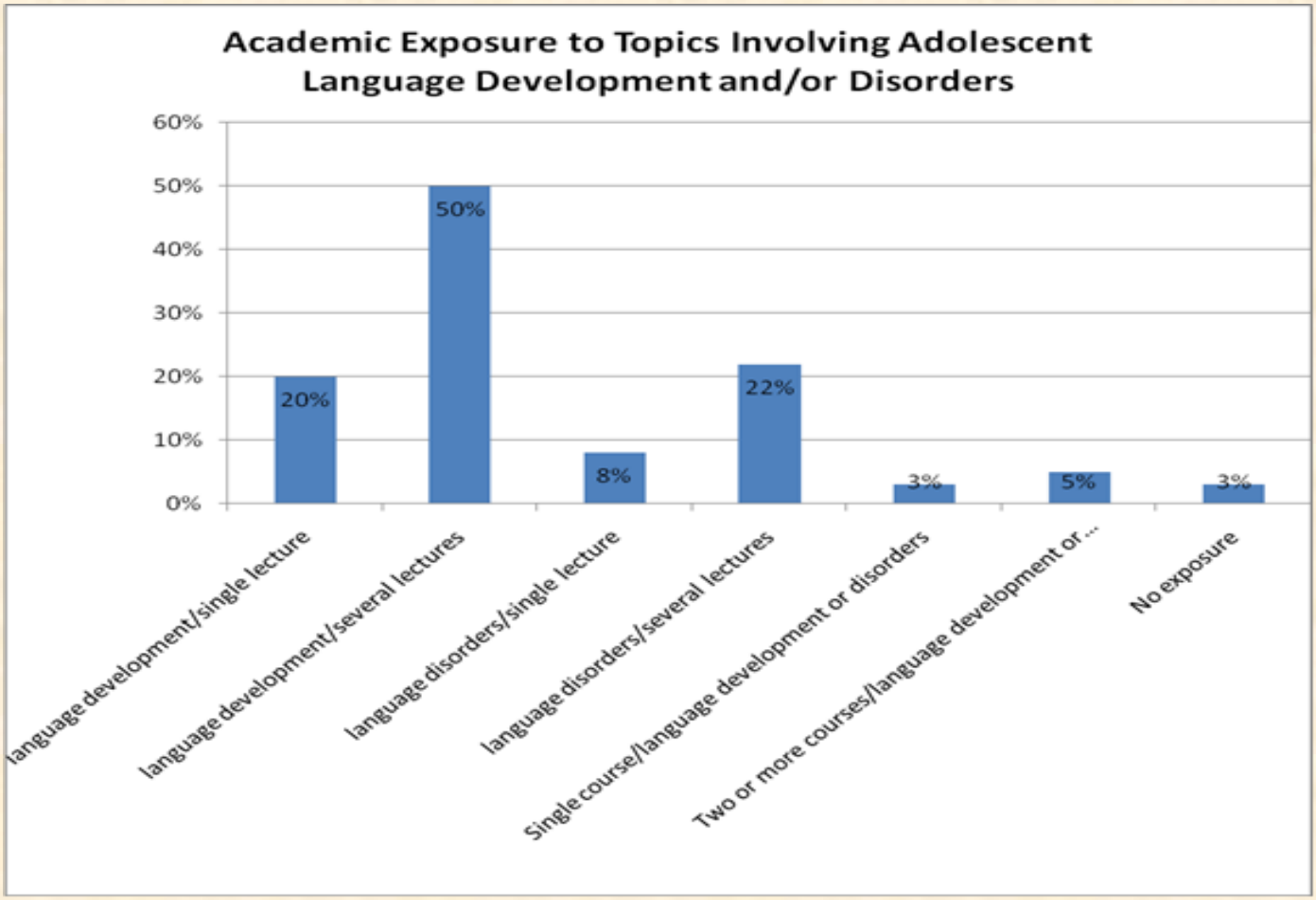

FIGURE 1. Academic exposure to topics involving adolescent language development and/or disorders.

	Q2.5	Q2.6	Q2.7	Q2.8	Q2.9	Q2.10
"No" Count	50.000	49.000	24.000	24.000	24.000	27.000
Percentage	0.877	0.860	0.421	0.421	0.421	0.474
p-value	0.000	0.000	0.883	0.883	0.883	0.654

TABLE 1. Calculation of p-value for selected survey questions to determine whether the number of "no" responses was significantly more than the number of "yes" responses.

communication development? (i.e., a course devoted entirely to adolescent communication development)" and "*Did your program provide specific course(s) on communication disorders in adolescents? (i.e., a course devoted entirely to adolescent communication disorders)*" than "Yes" responses. In another words, it is not possible to have such a big discrepancy in proportion if the true proportion is equal. However, for the other questions presented in this section, the results are not significant.

Respondents were also asked to rank options that they felt best prepared them to work with the adolescent population. The options included their graduate program, on-the-job training, CFY supervisor, current supervisor, colleagues, other, or none of

the above. On-the-job training was ranked as the option that has best prepared the respondents to work with the adolescent population. Being able to discuss treatment plans and ideas with other speech-language pathologists ranked as the second most beneficial option. The third most beneficial option that best prepared the respondents to work with the adolescent population was their graduate program. Finally, the respondents ranked ideas and techniques gathered from a current supervisor as the fourth best option that prepared them to work with this age group. The goodness-of-fit test was conducted to determine if the superior performance of "on the job training" was statistically significant. The test results suggested that there is very strong evidence that "on-the-job training" prepared speech-language pathologists the most to adequately serve the adolescent population with speech and language disorders.

Respondents were also asked about their confidence level in regards to treating the adolescent population with language disorders. When asked if the respondents were confident in their abilities to adequately serve the adolescent population upon graduation, 60% responded in the affirmative. This percentage correlates to 34 "yes" responses out of 57 total responses. The p-value shows that the possibility of getting such a proportion under the null hypotheses of equal proportion is 0.073. This resulting p-value suggests that the "yes" responses to this question are not significant at the 0.05 level.

DISCUSSION

Researchers have suggested that one of the barriers to successfully serving adolescents with speech and language disorders is the training speech-language pathologists receive in their graduate program (Larson & McKinley, 2003; Magnotta, 1991; McKinley & Lord-Larson, 1985; Miller, 1989; Whitmire, 2002; Whitmire & Eger, 2003). Therefore, this study explored the perception of training that speech-language pathologists were exposed to regarding the adolescent population with speech and language disorders.

A vast majority of the respondents indicated that they were not exposed to specific courses on adolescent communication or disorders. However, a majority of respondents did report being exposed to adolescent language development and disorders via one or more lectures that were contained within another course. Very few respondents indicated that they had taken one or more courses devoted entirely to this population. A slight majority of respondents reported having the opportunity to work with this population via clinical placements. These results are mixed when compared with the results from a survey conducted in 2002 and reported in Larson and McKinley (2003). Results from the 2002 survey indicated that 86% of the programs reported providing specific course content on adolescent communication disorders while 93% of the responding graduate programs believed that it was important to train students specifically in assessment and intervention of adolescents. Results from the survey in this study revealed graduate students are exposed to adolescent communication development and disorders within the contexts of other courses. However, when completing statistical analysis of the yes/no responses regarding adolescent exposure, the only two questions whose responses were found to be significant were "no" responses regarding having taken one or more courses on adolescent language development or disorders. These results contradict what was reported by Larson and McKinley (2003) regarding the importance graduate programs reportedly placed on training students in assessment and intervention of adolescents and offered some support to their conclusions which were summarized as follows: "Despite our most fervent efforts for the 20 years, it remains a challenge to appropriately prepare students for serving the older student population" (p. 432).

Even with very little coursework offered or taken, half of the respondents reported feeling adequately prepared to work with the adolescent population when they graduated from their master's program. When asked, however, what option most prepared these professionals to serve this population, their graduate program was not the first or second choice. Rather, on-the-job training and discussing techniques with colleagues ranked higher than their graduate program. One explanation for this result could be the fact that very few speech-language pathologists provide speech and language services primarily to the adolescent population (ASHA, 2006, 2008; Ehren, 2002). Therefore, they may rely on their graduate training when working with their primary caseload, which consists of younger children, but depend on experience and colleagues when working with the few adolescents that are also on their caseload. Attending various continuing education options also appears to be a manner in which speech-language pathologists are obtaining current information regarding the adolescent population and intervention options. Sixty-six percent of respondents in this survey reported attending conferences, seminars, or workshops in the past five years regarding adolescent communication disorders while 85% reported attending workshops, conferences, or seminars on service delivery models in the past five years.

Results from this study contradict the notion that speech-language pathologists feel uncomfortable in the secondary school setting and seem to support the results reported by Campbell and Taylor (1992). Even with the reported limited training and exposure to topics in adolescent communication development and disorders, many of the speech-language pathologists who completed the survey used in this study reported feeling confident in their abilities to serve this population. This result may be due to the sample obtained in this study, however. Seventy-five percent of respondents reported having worked with the adolescent population for 6 or more years, and would therefore have a sense of comfort now that may not have been there when they first began serving this population.

Lastly, results from this study reiterated what Larson and McKinley (2003) summarized when they stated: "Despite our most fervent efforts for the last 20 years, it remains a challenge to appropriately prepare students for serving the older student population" (p. 432). As noted by the responses from the survey utilized in this study, many speech-language pathologists are graduating from their graduate programs armed with knowledge on adolescent language development and disorders obtained from one or two lectures contained within the context of another class. On-the-job training and access to colleagues to discuss ideas and techniques, not their graduate program, were reported as the two most important ways speech-language pathologists prepared for this population.

Based on the results of this study, several recommendations can be made for improvements in the graduate curriculum that would improve the preparation of speech-language pathologists for clinical service delivery to adolescents. First, graduate programs should consider adding one or two classes devoted entirely to adolescent language development and disorders. Furthermore, strategies and techniques for working in inclusive environments should be infused into appropriate academic coursework. As noted above, a vast majority of the respondents indicated that they were not exposed to specific courses on adolescent communication or disorders, but rather exposed to adolescent language development and disorders via one or more lectures that were contained within another course. Adding this course content would provide students with the needed theoretical knowledge to successfully work with this population. Even though a slight majority of respondents reported having the opportunity to work with this population via clinical placements, graduate programs should also emphasize the importance of working with this population by providing as many clinical opportunities as possible that emphasize the different service delivery options that are available. Supervisors should be encouraged to expose the graduate students to not only traditional pull-out methods, but also collaborative, classroom-based models. If clinical opportunities are not available that award students the benefit of experiencing both traditional and collaborative models of intervention, graduate programs should take the initiative to bring speech-language pathologists into their classrooms to discuss service delivery models with the adolescent population. Video technology should be used as permitted by privacy laws to allow students to observe speech-language pathologists in action who work with this population.

Research Limitations

Several limitations exist with the design of the current study and must be considered when interpreting and placing value on the results obtained.

Sample Size. The largest limitation was the sample size. The response rate for this study was not as high as expected even with several attempts made and a pre-notification letter used. It is possible that the results do not reflect the perspectives of the profession as a whole. Participants were limited to speech-language pathologists who work in Virginia public schools, however, 48% of participants attended a graduate program that was outside of the state of Virginia. This participant pool may reduce generalization as well. Secondly, although t

Participants. he target population for this study were speech-language pathologists who work in the public school setting with the adolescent population, it cannot be ignored that only speech-language pathologists with an interest in the adolescent population may have responded more readily to the survey than those who were assigned a secondary school setting but did not particularly feel comfortable with this placement. The fact that more than 75% of the sample for this study reported more than 6 years of experience suggests that this limitation is a feasible one. It is possible that the results would be higher or lower depending on the particular respondents. For example, speech-language pathologists who chose not to respond may be even less confident in their knowledge and skills.

Survey Tool. Thirdly, although the survey developed for this present study was based on several examples from the literature, the survey itself was not validated. Even though the instrument was pilot tested for clarity, it is possible that some questions may have been confusing to participants. For example, some respondents did not answer questions as directed. Therefore, the responses for these questions could not be used for data collection. Also, the survey was e-mailed as an attachment to possible participants and at times, depending on the version of Microsoft Word that the recipient's computer had loaded, the format of the survey was not maintained. In several instances, check boxes would not operate correctly and text boxes covered survey content. This issue was not reported during pilot testing, and therefore, was not realized until after survey distribution. Lastly, errors in recall could have played a role in the discrepancy between the respondents reporting the course content they were exposed to regarding the adolescent population and their overall feeling of being prepared to serve this population.

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UNIVERSAL DESIGN FOR LEARNING (UDL) AND ASSISTIVE TECHNOLOGY (AT) FOR DIVERSE LEARNERS

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ABSTRACT

Population changes have resulted in increasingly diverse multicultural contexts for the delivery of services to children with communication disorders. The diversity witnessed in schools, thus demands a paradigm shift in the perception of "normal" and the use of "best practices." Understanding and accepting "diversity as normal" requires a transformationist perspective that advocates for social justice and effectively utilizes the principles of Universal Design for Learning (UDL) (Alexander, 2005; Barker, 2003; CAST, 2008; Howard, 2006). This article will discuss the integration of two models, Universal Design for Learning (UDL) and Assistive Technology (AT). These two models serve to promote culturally responsive learning environments that are collaborative, inclusive, and engaging. UDL and AT will be addressed with particular attention to multicultural educational theories, culturally responsive treatment models (Bridges-Bond, Gillespie, & Johnson, 2010), social paradigms in the classroom (Howard, 2006) and family/professional partnerships (Calculator & Black, 2009) that support diverse learners with communication disorders.

KEY WORDS

Universal Design for Learning (UDL),
Cultural and Linguistic Diversity (CLD,)
Assistive Technology (AT), School Age Children,
Multiculturalism and Education

It has been brought to the attention of speech-language pathologists (SLPs) and classroom teachers alike that population changes in our country have resulted in multicultural environments for service delivery in communication disorders as well as the wider conventional education arena (Battle, 2002; Stockman, Boult, & Robinson, 2008). As diversity emerges as the norm, the US public schools represent a mosaic of diverse cultural, ethnic, linguistic, and ability groups. The new norm is not a passing phase but an emerging trend. The growing diversity of our nation, is mirrored by schools in many counties once deemed, "middle America." Furthermore, the complexity of this evolving mosaic is layered by variations in social economic stratification, physical and cognitive differences and exceptionalities, disenfranchized and privileged people, and a range of cultural and ethnic values, beliefs, and experiences. Embracing these difference echoes the mantra of proponents of cultural and linguistic diversity (CLD) and cultural competency.

The National Educators Association (NEA) (2007) reports that CLD students make up the largest growing group within our public schools today. Historically, CLD students have been disproportionately represented in special education (NEA, 2007; NCCRESt, 2006). Disproportionalty is an issue of equity and access in general and special education. The causes of disproportionality can be attributed to poverty, cultural bias evident in referral, assessment and placement practices, interpersonal bias, differences in school readiness, lack of culturally responsive curriculum and intervention, lowered expectations and misinterpretations/pathologization of behaviors of children who are CLD (Battle, 2012). A deficit perspective serves to marginalize CLD children, and deny access and opportunity to inclusive learning environments (NEA, 2007). While "access" can be operationalized by multiple perspectives, the inaccessibility experienced by students of diverse backgrounds and life experiences is often evident in the nature and implementation of academic tasks and activities (NCCRESt, 2005).

Mainstream America and Education

Why is it important to discuss the social construct of "mainstream" in America? Mainstream America typically constitutes the majority. In the US White Americans reflect the majority, characterized by middle American linguistic and cultural patterns. In the context of language usage, the dominant linguistic pattern in the US is referred to as Mainstream American English (Seymour, Roeper,& de Villiers, 2003).

Inclusion in the mainstream population comes with the privilege of defining that which is considered "normal." "Normal" reflects basic expected patterns of behavior as seen by the mainstream (Harry, Arnaiz, Klinger & Sturgess, 2008). Poindexter (2010) states that the ability to define "normal" is connected to power. Further, the dominant group has the privilege of defining and enforcing the norms in the community (Poindexter, 2010). The position of power allows the majority culture to enforce its beliefs concerning what is 'right' and 'wrong' and what is and is not acceptable behavior (Sadri & Flammia, 2011). It is assumed that in order to appear "normal," one must conform to these beliefs without significant deviation. Children who have been swimming in the mainstream by virtue of their existence have access to ongoing activities such as communication patterns and social behaviors that naturally prepare them for interaction in mainstream society (Harry et al., 2008). If education, schooling, and pedagogy are subject to the societal influences which are considered "normal" in mainstream society, what does that mean for those who are considered culturally and linguistically different? All children are a product of their cultural and social experiences. If these experiences do not mirror that of the mainstream society, how is it reflected in the manner in which our children are educated in schools today?

Differences may be erroneously mistaken as deviant when a child's behavior reflects the home culture creating a misalignment between home and school cultural expectations. Thus, what is perceived as disordered in one setting, may not be in another (West, Leon-Guerrero, & Stevens, 2007). The sentiment of bell hooks (1994) remains true today—the growing diversity of society requires a transformative perspective that reflects multicultural views, promotes inclusion, and respects and honors the social realities of diverse populations.

Transformationalism and Social Justice

In order for speech-language pathologists (SLP) and educators to provide quality service to this growing diverse population, there would need to be a paradigm shift. Such a shift moves us away from socially constructed ideas of "normal" to a perspective which recognizes that different is not tantamount to deviant. This transformationist perspective requires educators and SLPs serving today's youth to view others in a more authentic manner across various racial and ethnic communities as well as across and within areas of exceptionality (Howard, 2006). Educators and SLPs who view differences from a transformationist perspective demonstrate culturally responsive interactions that reflect fervor for equity in service delivery (Howard, 2006). The "good" SLP therefore implements a service delivery model that is multicultural in nature and therefore culturally competent in practice (Sue and Sue, 2008).

Universal Design for Learning

If one subscribes to this paradigm, there is an assumption that people are socialized and motivated to learn differentially and that they have the ability to express knowledge in various ways (CAST, 2008) that are rooted in cultural associations. One model that promotes widening our definition of "normal" is the Universal Design for Learning (UDL). UDL utilizes information garnered from brain research and adaptive design technologies that enable educational success for students with varied learning requirements (Ralabate, 2011; Smith & LeConte, 2009). According to the Center for Applied Special Technology (CAST, 2008) each person's brain processes information in different

ways. The ways in which individuals learn can be as uniquely different as a fingerprint.

Neurological theories of learning have contributed to our understanding of differences. Brain research provides evidence that people gather and categorize information in a variety of ways based on what is seen, heard, and read. Thus, visual, auditory, and kinesthetic input is inclusive of the environments and the populations that surround people in their everyday life (CAST, 2008).

The application of this theory suggests that people require the freedom to participate in learning in multiple ways. It also addresses teaching and clinical practices. Best practices are evident when consideration is given to all learners in a classroom setting while lending close attention to differences inherent to academic, cultural, linguistic and socioeconomic diversity (Grodsky & Jackson, 2009). Similarly, information should be presented in a variety of ways where children are given multiple opportunities to actively participate in the learning experience and to express their knowledge in diverse ways.

Traditional mainstream educational practice, often times , does not reflect these beliefs and/or practices. A rigid response to curriculum requirements or traditional methods often does not take into account individual references to the variability of the cultural experience (NCCRESt, 2005).

Diversity is the Norm

"*Diversity is the norm, not the exception, wherever individuals are gathered, including schools. When curricula are designed to meet the needs of the broad middle—at the exclusion of those with different abilities, learning styles, backgrounds, and even preferences, they fail to provide all individuals with fair and equal opportunities to learn" (CAST, 2009, p.3).*

Children at risk from diverse backgrounds and those diagnosed with disabilities require a method of intervention to better access the curriculum. This automatically considers flexible instructional and assessment methods that reach those from different cultural backgrounds including those with disabilities (Smith & LeConte, 2009). The concept of universal design as originated in the 1980's placed focus on architecture and product development to create an accessible environment, for individuals with disabilities as well as the general public. The principles of UDL extend accessibility beyond the physical environment to all aspects of learning (CAST, 2011). Collaborative stakeholders in the development of this model have included education researchers, neuroscientists, practitioners, and technologists (CAST , 2011).

Subsumed in the theory of UDL are three guiding principles that promote a flexible responsive curriculum: 1) multiple methods of presentation, 2) multiple options for participation and expression, and 3) multiple means of engagement (CAST, 2008). These guiding principles opens spaces for educators, administrators, and SLPs to work together to promote varying ways and means for learning. This model promotes the use of educational supports needed to decrease the achievement gap that places minority and children with disabilities further behind their peers.

Principle 1: The first principle provides multiple means of representation utilizing flexible methods of presentation to support recognition learning. Diverse learners process sensory information in varying ways as auditory, visual, and tactile/kinesthetic learners. Cultural (i.e. life experiences) as well as linguistic variables (i.e.language proficiency) impact the many ways content is perceived and given meaning. For a child with sensory needs, learning may be enhanced or limited by providing multisensory learning experiences and opportunities. Examples of the "what of learning" as utilized in an inclusive preschool environment are illustrated in Table 1.

Principle 2: The second principle provides multiple means of expression and action, supporting strategic learning. Multiple means and modes of expression and action are created when students are required to provide evidence of their knowledge, understanding and learning. For students with communication disabilities and needs this may be facilitated by adapted learning tools, assistive technology, non-linguistic response, or other physical actions (CAST, 2011). Examples of the "how of learning" are illustrated in Table 1.

Principle 3: The third principle provides multiple means of engagement, supporting affective learning. Paramount to the successful learning of every student is motivation. This component of learning refers to the emotional desire that is fueled by personal drive, curiosity, novelty, desire for mastery and a host of factors that drive motivation (CAST, 2011). The affective network is the most powerful of the systems critical to learning. For example, Fink (1995/1996, 1998) examined adults diagnosed with dyslexia who were found to be highly successful. The common variables found to contribute to their successful resolve of severe deficits in their reading ability were their deep engagement and interest in a given subject matter. Their learning outcomes were significantly improved by their positive affect in spite of their deficits. Examples of the "why of learning" are illustrated in Table 1.

Assistive Technology (AT)

While technology and UDL are not synonymous, the effective application of assistive technology (AT) serves to provide, multiple means of representation (e.g. graphic displays and interactive story books depicting culturally relevent language/learning concepts), multiple means of expression and action (e.g. dynamic display with English/Spanish voice output for school and home use), and multiple means of engagement (e.g., applying personal interests and talents in real life

Valentine's Day - Celebrating Family and Friends

Goal 1: Children will communicate an understanding of relationships (e.g. friendship, family, feeling).

Goal 2: Children will recognize and identify the phoneme /f/ and the letter "F" and "f".

Multiple Means of Representation ***The "what of learning"***	**Multiple Means of Participation and Expression** ***The "how of learning"***	**Multiple Means of Engagement** ***The "why of learning"***
Circle Time Valentine Day Across Communities and Around the World. • Internet Videos "You Tube" • Graphic Images/Symbols and Photos • Family Photos • iPad Slide Show (e.g. friends and classmates) Multisensory Artifacts • Grab Bags • Cards • Hearts • Candy Messages • Puppets Bilingual Talking Switches, Dedicated/Speech Generating Devices (SGD) and Recorded Messages Electronic Family Photo Album Manual Signs	**Story Time** **Shared Book Reading** Letter of the Week 'F' • iPad apps - *ABC Tracer* • Fridge Phonics Story Books (stories, folktales, languages and people around the world) • Leap Pad • iPad • Big Books • Flip and Pop Up Books • Story Boards • Word Wall • Felt Board • Book Builder • Text Reader • Talking Books Writing/Literacy Center • Dry Erase Board • Chalkboard • Drawing Instruments • Magnetic Letters /Board • Stamps • Markers • iPad Writing/Drawing Apps • Adapted Writing Tools • Literacy Software	**Music Time** **Rhyme, Rhythm, and Song** Valentine Day - Cultural Parades and Celebrations • Internet Video "You Tube' • iPad • Home Videos • Children's Songs • Nursery Rhymes • Poems • ITunes • Music MP3 • *World Playground* • Song Books • Song Boards • Global Musical Instruments • Cultural Dances

TABLE 1. Clinical application for the UDL model for diverse preschool learners,

experiences or simulated activities - an advice column journalist for the school newspaper using iPad adapted writing apps) (Bridges-Bond, Gillespie, & Johnson, 2010; Gillespie, Bridges-Bond, Johnson, & Cromartie-Brown, 2011). The principles of UDL when applied to AT serve not only to support CLD learners but improve outcomes for all learners (Bridges-Bond, et al., 2010; Gillespie, et al., 2011).

For some students, fueling their interests begins with removing external opportunity barriers or "inequities" driven by policy, practice, knowledge, attitude, and/or skills (Beukelman & Mirenda, 2005). Whether imposed by an individual (e.g. principal), a collective group (e.g. school board) or an institution (e.g. school), opportunity barriers create inaccessible, rigid learning environments that limit the engagement of CLD students with communication disorders. Learning in this context may be perceived as fear provoking, threatening to personal values, sense of self and self-esteem, or an insurmountable obstacle to learning.

AT in the Schools

CLD students with communication disorders often benefit from culturally responsive, creative application of technological solutions to support oral, written communication, speech, language, learning, physical, sensory, and social development. The creative application of assistive technology ranging from everyday tools to cutting edge technology can provide the necessary support for diverse learners to participate in an inclusive program or general education classroom (Calculator & Black, 2009; Jackson, 2005). Various forms of AT support prove to be critical for full participation in academic and social environments.

In addition to technological supports, communicatively impaired students benefit from family support as well as the support of teachers from general and special education, related service providers, classmates as well as school administrators (Calculator & Black, 2009). For inclusion to be successful, it is necessary for these students to have access to a culturally responsive curriculum that employs the UDL model supporting the what, how, and why of their learning. Critical to each student's academic success is the application of the principles of UDL and best practices for AT service delivery. Central to the attainment of best practices is the effective collaboration between the speech-language pathologists (SLP), teachers, administrators, caregivers/parents, and a host of other supports (Calculator & Black, 2009).

Collaboration and Teaming

In the general education curriculum an interdisciplinary team of educators and related personnel (e.g. SLP, OT, PT, etc.) are required to implement principles of UDL. UDL promotes accessibility by removing learning, physical, social, and communication barriers that serve to exclude diverse learners from inclusive and general education learning environments (Jackson, 2005). A diverse, collaborative education team with expertise in culturally responsive intervention builds an educational environment that is flexible and culturally responsive by the multiple ways they support student expression and participation as well as in how they engage their students in the learning process (Davis & Banks, 2012; Jackson, 2005).

Vital to effective AT services is the collaboration of an expert team (Soto, Muller, Hunt, & Goetz, 2001; Stark, Kent-Walsh & Binger, 2007). The success of effective team collaboration has been reported to directly impact positive long-term outcomes for students with communication needs. Conversely, AT users describe the lack of effective team collaboration among families and professionals as a barrier to positive outcomes (Fallon, 2008; Lund & Light, 2007).

Conclusion

The rapid shift in the mosaic pattern of today's schools has alerted us to the critical need for an aggressive change in the philosophical and theoretical perspective of "normal" and the search for "best practices" in addressing the needs of an increasingly diverse student population. A challenge to our current educational system has been the movement from segregated to inclusive classrooms in general education programs for culturally and linguistically diverse students with communication disorders.

Embracing diversity as the *new norm* requires a transformationist view that advocates for social justice and effectively utilizes the principles of UDL. Collaboration among culturally competent professionals is key. Closing the achievement gap that places CLD students with communication disorders further behind their peers requires the successful integration of inclusive educational services where AT serves as a critical tool to establish leverage, providing multiple means of representation, multiple means of expression and action, and multiple means of engagement.

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PUERTO RICAN SPANISH: BASICS FOR THE TREATMENT OF PHONOLOGICAL DEVIATIONS

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ABSTRACT

Hispanics comprise over 16% of the total US population. About three-quarters of Hispanics in the United States were reported as being of Mexican, Puerto Rican or Cuban origin in the 2010 Census. Puerto Ricans, the second largest group, comprised 9% of the Hispanic population in 2010. Now more than ever there is a need to examine the characteristics of Spanish language and the alternatives we as communication professionals have to provide the least-biased assessment and treatment evidence-based practices. This article presents an overview of Puerto Rican Spanish characteristics that will help clinicians differentiate disorders versus dialectal features, as well as to present a pattern-oriented treatment option based on Hodson's Cycles Approach.

KEY WORDS

Puerto Rican Spanish,
Dialectal Features,
Speech Sound Disorders and Treatment

INTRODUCTION

The 2010 census showed that the US Hispanic population grew four times faster than the total US population in the decade prior to the census. The Hispanic population increased by 15.2 million people between 2000 and 2010 and accounted for more than half of the total U.S. population increase of 27.3 million people. Between 2000 and 2010, the Hispanic population grew by 43 percent, or four times the nation's 9.7% growth rate. The need to provide culturally sensitive, evidence-based, and the least-biased services have been historically stressed in the literature and have even become legal mandates. With the growing Hispanic population in the US, the need for treatment approaches tailored to the Hispanic population needs is more evident than ever.

Evaluation and treatment instruments have the purpose of identifying the needs of a client. Therefore, the instrument should be developed in the primary language of that client (Hodson & Paden, 1981). It is the responsibility of Speech-Language Pathologists to differentiate the array of patterns that are typical of the speech community of a client from those that are indicative of a phonological disorder (Bernthal & Bankson, 2004). Children's productions that conform to the dialect of the community may be misidentified by speech-language pathologists who are not familiar with the dialect of the children they serve (Goldstein, 2001). Knowing and recognizing patterns that are typical can lead to the least-biased assessment and plan for intervention possible. Phonological assessment should be able to provide a description of the speech production patterns of children, identify differences between normal patterns and those exhibited, and provide indicators regarding the speech development stage (Bosch, 2004).

SPANISH PHONOLOGICAL SYSTEM AND PUERTO RICAN SPANISH

The Spanish phonological system is different than that of English in terms of fewer consonant and vowel phonemes, relatively longer words, and less complex syllable structure (Goldstein, Fabiano & Iglesias, 2004). There are phonemes that exist in Spanish that do not occur in English and vice versa. Furthermore, phonological development for Spanish speaking children is also different (Goldstein, Fabiano & Iglesias, 2004). Phonological variations of Caribbean Spanish (which may apply to other dialects of Spanish) as noted by Hammond (1989) include: (1) syllable final, word final aspiration of /s/; (2) general word final sound deletion; (3) /r/ and /l/ substitution in some dialects for Spanish; (4) vocalization of word final liquids; (5) word final /n/ velarization; and (6) alternation of /tʃ/ and /ʃ/.

There are five vowels in Spanish; /i/, /e/, /a/, /o/, & /u/, and 19 consonants; the stops /p/, /t/, /k/, /b/, /d/, and /g/; the fricatives /f/, /s/, and /h/; the affricates /dʒ/ and / tʃ/; the glides /w/ and /j/; the liquids lateral /l/, tap /ɾ/, and trill /r/; and the nasals /m/, /n/, and /n/. The three voiced stops /b, d, g/ have the allophones / β, ð, ɣ /. These mostly occur between vowels (Goldstein & Iglesias, 1996). Most common phonological features of Puerto Rican Spanish to be accounted as features, not as errors are: most syllables will be open syllables; vowels by themselves constitute syllables; elision will occur to the /d/ in word final position: e.g., /sa-lud/ becomes /sa-lu/; /s/ in an interior coda or at the word-final position will be aspirated: e.g., /kas-ko/ becomes /kah-ko/; and the /ɾ/ in coda position either at the word-interior or word final position will become /l/ -lateralization: e.g., /kar-ta/ becomes /kal-ta/ (Bou, 2009).

Also, it is important to know the structure of the language. In Spanish 25% of the words are tri-syllabic. Spanish syllabic structure is fairly simple. In frequency of occurrence, Spanish most common syllables are CV (56%), followed by CVC (20%), CCV (10%) and VC (3%) (Blecua and Alcina, 1975, in Bosch, 2004). In Puerto Rican Spanish most of the final consonants are deleted. This dialectal feature gives Puerto Rican children fewer opportunities to delete the final consonant of a word. This deletion is not typical in other Spanish-speaking cultures (Goldstein & Iglesias, 1996).

The importance of recognizing the differences among languages in order to reduce bias in assessment and intervention planning has been widely recognized in the literature (Bernthal & Bankson, 2004; Goldstein & Iglesias, 2001). Phonological patterns delineated as dialect features should not be scored as errors on phonological assessments. Failing to account for these dialect features in phonological assessment may either shift the diagnosis from one of "typically developing to one of "phonologically disordered" or alter the severity category (e.g., from mild to severe phonological disorder) for children who are considered phonologically disordered (Goldstein, 2001). Goldstein and Iglesias (2001) stated that since Spanish dialects differ greatly from each other, and these differences are characterized by consonant distinctions the consequences of not taking dialect into account during assessment or treatment may be more serious for Spanish-speaking children. Considering Puerto Rican (Bou & Hidalgo, 2010, Goldstein & Iglesias, 1996) Spanish dialectal features will allow clinicians to clearly differentiate a phonological disorder from a dialectal feature.

PHONOLOGICAL DEVELOPMENT

Spanish-speaking children acquire the sounds of their language in early stages. This is probably a result of the structure of the Spanish in general and of the phonological dialectal features of Puerto Rico in particular. The structure of Spanish in Puerto Rico is primarily consonant-vowel (CV), which facilitates the development of the phonological system. Vivaldi (1991) investigated the development of each of the phonological processes in Spanish. The author observed in their natural environment, four typically-developing children from 19 to 28 months. Vivaldi found that the elimination of the phonological processes is not as systematic as noted in the literature, that there is an instability period before gradual elimination occurs,

and that individual preferences may alter the order of elimination.

PHONOLOGICAL DEVELOPMENT STUDIES CONDUCTED IN PUERTO RICO

Torres (1984) examined the productions of 90 3- to 5-year old children from low-income families in the Barranquitas municipality. Results demonstrated that children between 5;6 and 5;11 still struggle with some articulation skills specifically the /s/, /r/ and /ɾ/ singletons; /pɾ/ and /fɾ/ clusters in initial position; /gl/, /gɾ/, and /dɾ/ clusters in medial position and the /aw/ and /ej/ vowel combinations. Stepanof (1990) found that at the end of the preschool years Puerto Rican children may exhibit cluster reduction, weak syllable deletion, and stridency deletion among others, but will likely have suppressed fronting, stopping, and assimilation. Studies have found that monolingual Spanish-speakers developmental patterns include: (1) consonant sequence/cluster reduction; (2) stridency deletion (dialect dependent); and (3) deviations of liquids (i.e., flap /ɾ/ and trill /r/) (Fabiano-Smith & Goldstein, 2010). In further research, De La Mata and Bou (2011) studied the phonetic development of twenty preschool children between 3;0 and 4;11 years. Results indicated that by 4;11 the majority of children has developed all phonemes and clusters. The tap /ɾ/ as a singleton or in clusters formed with velars /k/ and /g/ showed the strongest instability.

SPEECH SOUND DISORDERS

Children with Speech Sound Disorders (SSD) comprise the largest number of individuals on clinician caseloads in the school setting (ASHA, 2010 in Prezas, 2012). Speech-language pathologists often use the term "articulation" to refer to mild or moderate speech-sound disorders and either "phonology" or "apraxia" to refer to severe or profound issues. The umbrella term preferred by ASHA, however, is "speech-sound disorders" (SSD) (Bernthal, Bankson, & Flipsen, 2009 in Hodson, 2011). SSD cause in the majority of cases is unknown. In other cases, the cause could be associated as a secondary problem with a principal problem like cerebral palsy or cleft palate. In addition, SSD could co-exist with concomitant factors like language and reading problems. To understand the nature of the disorder and to be able to clearly identify its motor or linguistic basis, will allow the selection of the best treatment approach to speed intelligibility gains.

TREATMENT APPROACHES: INTRODUCTION

Traditional treatment approaches were directed toward the motor aspect of sound production. These approaches treated one sound at a time and the intervention focused on the phonetic properties necessary for acoustic production and perception. Linguistic or rule-based approaches are different in their scope. These concentrate on working with the rules governing the combination of sounds within a language. Its emphasis is to teach the rule; no value judgments are made regarding correct or incorrect productions. There is a de-emphasis on motoric manipulation or placement of the articulators. There is also a de-emphasis on auditory discrimination training. Modeling and the need for direct imitation on the part of the client is avoided if possible (Klein, 1996).

Although it seems very easy to distinguish between the two approaches (traditional versus linguistic or rule-based), literature may sometimes seem vague about how an approach is classified. Creaghead (1989) in Creaghead, Newman & Secord, (1989) establishes two principles that guide clinicians in evaluating their use and selection of a phonological paradigm: (1) *principle of knowledge governed by rules*, which states that if the children are to learn the phonological rules of their language, they need to be presented within circumstances that help them discover those rules, and (2) *principle of communicative function*, which states that for the intervention therapy to be effective, children must be given the opportunity to see the relationship between a phonologically correct production and the positive effect it has on the communication process.

A variety of approaches for working with children with SSD are available. Regardless of the selected approach, it is important to evaluate the evidence that supports the approach (Bernthal, Bankson & Flipsen, 2009). Basis for the selection of the appropriate treatment technique relies in the speech sample analysis and posterior diagnosis. The assessment, diagnosis, and treatment rely on phonological analysis (Yavas, 1998). The analysis of a speech sample may yield different results depending on the framework used (features, structures, phonological patterns). This analysis should be able to distinguish between a delay in phonological development and a phonological disorder. In the first, the child's speech is far from expected according to his or her chronological age. In the second case, the disorder, the course of development does not follow a typical sequence or atypical development patterns are present (Kamhi & Pollock, 2005). The analysis should be able to recognize the system used by the child although this system could be obviously different from his or her linguistic environment (Yavas, 1998).

Despite these differences, the common goal is to identify the simplification processes used by the child. This identification allows the design of intervention strategies to reduce the existence of such simplifications and facilitates a gradual approach from the "simplified" pronunciation of the child to the adult form (Bosch, 2004). Articulation and phonology are not mutually exclusive. Articulation is more than just a mechanical act. Articulation and phonology are integral to the language system. Articulatory production does not occur in isolation but coexists with other parameters of speech production (Weiss, Gordon & Lillywhite, 1987). Typically, articulatory and phonological problems coexist in children, and treatment should provide for both. However, it is extremely important that the clinician is aware of the nature of the problem. The progress in treatment will be affected by the choice of approach. This should correspond to the nature of the problem.

A PATTERN-BASED PHONOLOGICAL APPROACH

The Cycles Approach was designed by Barbara Hodson in Chicago in the 1970s (Hodson, 1978) for the intervention with highly unintelligible children, including children with apraxia. It focuses on facilitating the emergence of correct phonological patterns rather than eliminating those in error. Phonological patterns are facilitated to speed intelligibility gains in the shortest time possible (Hodson, 2007). A cycle is a period of time that is completed when all the patterns that the child needs to address have been presented. Some cycles range from 5 to 6 weeks, while others last up to 16. Phonemes are used as tools to facilitate the emergence of correct patterns. Each phoneme is used between 2 and 6 hours to facilitate a pattern in each cycle. The patterns are recycled until they are used during spontaneous speech. The structural complexity of targets is gradually increased over the cycles.

In 1992, Hodson addressed the idea of "Applied Phonology" pointed out that by that time, many children were making excellent progress when treated with the Cycles Approach. At that time, Hodson made it clear that the approach was still evolving. With this statement, she extended an invitation to clinicians to continue searching for more effective and efficient methods for expediting intelligibility gains in children. Hodson (2011) establishes that more research is needed to determine how the cycles approach could be adapted to be used with children who speak other language than English.

Determining the phonological status of a client is important to select optimal targets patterns to expedite intelligibility gains (Hodson, 2007; 2011). Evaluation and treatment instruments have the purpose of identifying the client's needs. Therefore, the instrument should be developed in the client's primary language (Hodson & Paden, 1981). In order to guide the target selection process for Puerto Rican Spanish speaking population, a pattern-oriented phonological approach based on the Cycles Approach was developed. This pattern-oriented approach considers the most common dialectal features of Puerto Rican Spanish (Bou, 2010, Goldstein & Iglesias, 1996, Prezas, 2012) and Spanish phonotactics regarding the formation of syllables (Alers, 2005).

Preliminary work on the adaptation of the Cycles Approach for Puerto Rican Spanish was first completed by the author in October 2009, who then shared the approach with Hodson for review and recommendations, which the author then incorporated into her adapted procedure.

An initial case study applying this pattern-oriented approach was conducted during 2010 (SUAGM-IRB Protocol #03-185-10). A 5 year-old phonologically disordered Puerto Rican child was treated during twelve weeks. At the beginning of the intervention the child presented initial consonant omission at the word interior position [úa] - /una/ and cluster reduction [báso] - /braso/; [fútah] - /frutas/. The child either deleted liquids or substituted them for glides. After twelve weeks of intervention, which included targeting liquids before consonant clusters, the child: (1) demonstrated intelligibility gains, (2) eliminated initial consonant omission, and (3) made syllable onset CCV combinations. A formal presentation of the approach including the results of the 5 year-old child study was made at the 2010 ASHA Convention. During the Convention more feedback and recommendations from Hodson and others were incorporated into the approach. A final revision of the approach was completed on 2011.

The Cycles Approach was designed explicitly for children with highly unintelligible speech, including clients with the label of suspected CAS (Hodson, 2007). The pattern-oriented approach is also designed for highly unintelligible children but takes into consideration Spanish phonological rules (Bou, 2010, Goldstein & Iglesias, 1996) and Spanish conditions for the formation of syllables (Alers, 2005). It is applied following the same protocol of the Cycles Approach (2011):

(1) Review of the production practice picture cards from the previous session. The SLP reads approximately 20 words that contain the new target pattern for the week. The child listens actively but do not repeat. Slight amplification is provided. This will last around 30 seconds.

(2) Experiential Play-Production-Practice. The SLP provides a motivational activity that involves naming objects and pictures of four or five carefully selected target words with the week's pattern.

(3) Metaphonology Activity. The SLP provides activities that focus on thinking about phonology in a metalinguistic fashion, such as rhyming and segmenting words.

(4) Probe. The SLP conducts a probe of the optimal phoneme target for the next week within the pattern being targeted.

(5) Repeat (1) with slight amplification.

(6) Facilitation: The SLP presents and explains the listening list and the production-practice pictures to parents so they can provide a two-minute home practice period every day.

The pattern-oriented approach for Spanish has several differences from the English Cycles approach. As an example, liquids must be targeted before consonant clusters since onset position clusters in Spanish are formed with liquid /l/ and tap /r/. The differences and changes are summarized in Table 1.

SELECTION OF THE CORRECT TARGETS

A common factor across the different treatment options for SSD is the correct and appropriate target selection.

A PATTERN-ORIENTED PHONOLOGICAL APPROACH	
ADAPTACION AL ESPAÑOL DE PUERTO RICO BASADO EN EL SISTEMA DE CICLOS *Adaptation for Puerto Rican Spanish Based on the Cycles Approach*	RESUMEN DE CAMBIOS *Summary of Adaptations*
DESARROLLO DE SILABAS ***Syllableness***	
META ***GOAL*** Crear sílabas. *Develop syllables.* **CONDICIONES** ***CONDITIONS*** Las producciones están restrictas a monosílabos. *Productions are restricted to monosyllables.* **TRABAJAR EN** ***WORK ON*** Secuencias de vocales en palabras compuestas de 2 y 3 sílabas [a-a] - /kasa/ [e-e] -/nene/. *Vowel sequences in 2 and 3 syllables words.*	Se incluyen ejemplos. *Examples are included.*
META ***GOAL*** Crear sílabas CV *Create CV syllables.* **CONDICIONES** ***CONDITIONS*** Si sólo está produciendo V o VC o consonantes de desarrollo temprano como oclusivo o nasal. *If producing V or VC or early development consonants like plosives or nasals.* **TRABAJAR EN** ***WORK ON*** Labiales /p/ /b/ en posición de ataque. *Labials /p/ and /b/ in onset position.*	Se eliminan los deslizados como consonantes de desarrollo temprano. *Glides are eliminated as early development consonants.* Se indican las consonantes /p/ y /b/ como aquellas que deben trabajarse y se especifica que es en posición de ataque. *Consonants /p/ and /b/ are specified as labials to be worked on and the onset position is specified.*
META ***GOAL*** Crear VC *Create VC.* **CONDICIONES** ***CONDITIONS*** Que no presente la consonante en coda. *The consonant to be absent in coda position.* **TRABAJAR EN** ***WORK ON*** /n/ final si no la presenta. *Final /n/ if not present.*	Se especifica que nos referimos a la coda silábica y no a la consonante final de palabra. *It is specified that is the coda position we are referring to; not the word final consonant.* Se eliminan consonantes que no ocurren en posición final en el español. *Consonants that do not occur in Spanish in final position are eliminated.*
CONTRASTES ANTEROPOSTERIORES ***Antero posterior Contrasts***	
META ***GOAL*** Obstruyentes posteriores. *Posterior obstruents.* **CONDICIONES** ***CONDITIONS*** Que no los presente, que sean deficientes y estimulables. *Not to be present, to be deficient and*	Se eliminan los obstruyentes posteriores que no ocurren en posición final y se especifica que el resto deben trabajarse en posición de ataque silábico. *Posterior obstruents that do not occur in final position are eliminated and it is specified that the rest should be addressed in the syllable onset position.*

A PATTERN-ORIENTED PHONOLOGICAL APPROACH	
ADAPTACION AL ESPAÑOL DE PUERTO RICO BASADO EN EL SISTEMA DE CICLOS ***Adaptation for Puerto Rican Spanish Based on the Cycles Approach***	**RESUMEN DE CAMBIOS** ***Summary of Adaptations***
stimulable. **TRABAJAR EN *WORK ON*** /k/ - /g/ y /h/en posición de ataque. */k/ - /g/ and /h/ in onset position.*	
META *GOAL* Obstruyentes Anteriores. *Anterior obstruents.* **CONDICIONES *CONDITIONS*** Que presente backing. *Backing needs to be present.* **TRABAJAR EN *WORK ON*** oclusivos dentales /t/ y /d/ en posición de ataque y posiblemente el alveolar /n/ también en posición de ataque. *Dental plosives /t/ and /d/ in the onset position and possibly the alveolar /n/ also in the onset position.*	Se especifica la clasificación de la /t/ y /d/ como dentales. *It is specified /t/ and /d/ to be dental.* Se especifica que deben trabajarse en posición de ataque silábico y se especifica la clasificación de la/n/ como alveolar. *It is specified that they should be worked on the syllable onset position and it's specified the classification of /n/ as alveolar.*
LIQUIDOS ***Liquids***	
META *GOAL* /l/ en posición de ataque inicial de palabra. */l/ in the onset word initial position. /* l/ en coda y en posición de ataque en el interior de la palabra. */l/ in coda and in onset position at the word interior.*	Se recomienda moverlo para trabajarlos antes de los sinfones. *Liquids should be work prior to working in clusters.* Se especifica que deben trabajarse en posición de ataque silábico. *Syllable onset position is specified.* Se añade el trabajo de la /l/ en coda y en ataque en interior de palabra. *Working with the /l/ in coda and onset in the word interior position is added.*
META *GOAL* /r/ en posición de ataque inicial de palabra. /r / En posición de ataque en el interior de la palabra. (Se permitirá la velarización de la /r/ en ataque siempre y cuando se facilite la conciencia del grafema para fines de la lectura y la escritura). *Trill /r/ in onset at the word initial position.* *Trill / r / in onset position at the word interior.* *(Velarization of the /r/ will be allowed if grapheme awareness is facilitated for reading and writing purposes).* **CONDICIONES *CONDITIONS*** Para eliminar el gliding. *To eliminate gliding.*	Se especifica que el trabajo con la /r/ es en posición de ataque silábico. *The target position for the /r/ is specified to be syllable onset.* Se elimina el trabajo con los clustters (sinfones) porque estos se trabajan de forma sub-siguiente al cambiar el orden de trabajo. *Working with clusters is eliminated since they will be targeted in a different order.* Se añade el trabajo con la / r / en posición de ataque en el interior de palabra y se especifica la posibilidad de velarización y las condiciones para permitirla. *Working with the / r / in onset position at the word interior is specified along with the possibility of velarization and the conditions under it will be allowed.*

A PATTERN-ORIENTED PHONOLOGICAL APPROACH	
ADAPTACION AL ESPAÑOL DE PUERTO RICO BASADO EN EL SISTEMA DE CICLOS *Adaptation for Puerto Rican Spanish Based on the Cycles Approach*	RESUMEN DE CAMBIOS *Summary of Adaptations*
META *GOAL* / ɾ / en posición de ataque en interior de palabra y en coda. (Se permitirá la lateralización de la / ɾ / en coda siempre y cuando se facilite la conciencia del grafema para fines de la lectura y la escritura). *Tap / ɾ / in the onset position at the word interior and in coda. (Lateralization of the / ɾ / in coda will be allowed if grapheme awareness is facilitated for reading and writing purposes).*	Se añade el trabajo con la /ɾ/ en posición de ataque en interior de palabra y /ɾ/ en coda. *Working with the /ɾ/ in the onset position at the word interior is added.* Se especifica la posibilidad de lateralización y las condiciones para permitirla. *The possibility of lateralization is specified along with the conditions under it will be allowed.*
SINFONES ***Clusters***	
META *GOAL* Sinfones /pl/ - /bl/ - /kl/ /gl/- /pɾ/ - /bɾ/ - /tɾ/ - /dɾ/ - /kr/- /gɾ/- /fl/ - /fɾ/ en este orden en posición de inicio de palabra. *Clusters* /pl/ - /bl/ - /kl/ /gl/- /pɾ/ - /bɾ/ - /tɾ/ - /dɾ/ - /kr/- /gɾ/- /fl/ - /fɾ/ *in this order in word initial position.* CONDICIONES *CONDITIONS* Que sea estimulable. *To be stimulable.* TRABAJAR EN *WORK ON* Incorporar la frase "Es un _____" (insertando la palabra con el sinfon y alrededor del tercer ciclo, sinfones en posición interior de palabra. *Incorporate the phrase "Is a _____" (inserting the word with the cluster and around the third cycle, clusters in word interior position.*	Se propone mover la secuencia para trabajarlo luego de los líquidos. *The working sequence is changed so that liquids are worked prior to work on clusters.* Se especifica que se los sinfones se forman con /l/ y /ɾ/. *It is specified that clusters are formed with /l/ and / ɾ /.* Se sugiere la secuencia de trabajo de los sinfones de adelante hacia atrás y de /l/ a /ɾ/. *The sequence suggested to work with the clusters is front to back and from /l/ to / ɾ /.* Se recomienda alrededor del tercer ciclo la inclusión de sinfones en el interior de palabra. *Is recommended for clusters in the word interior position to be worked around the third cycle.* Se elimina aumentar la conciencia de los plurales porque no aplica. *To create awareness of plurals is eliminated since it does not apply to Spanish clusters.*
PATRONES SECUNDARIOS POTENCIALES ***Potential Secondary Patterns***	
Trabajar con cualquier patrón que aún presente problema (incorporar pares contrastantes - mínimos y máximos). *Work with any pattern that stills in problem (incorporate contrast pairs - minimum and maximum contrast.*	Se especifica que los pares deben ser de ambos tipos; mínimos y máximos. *It is specified that pairs should be of both types; minimum and maximum contrast.*
Contrastes de sonoridad (Posición pre-vocálica).	Se añaden ejemplos en español de los contrastes de sonoridad. *Examples of voice contrasts for Spanish are added.*

A PATTERN-ORIENTED PHONOLOGICAL APPROACH	
ADAPTACION AL ESPAÑOL DE PUERTO RICO BASADO EN EL SISTEMA DE CICLOS *Adaptation for Puerto Rican Spanish Based on the Cycles Approach*	RESUMEN DE CAMBIOS *Summary of Adaptations*
Voice contrasts (pre-vocalic position) Ejemplos [bulséɾa] - /pulseɾa/; [seɾßjéŋte] - [seɾpjeŋte]. *Examples [bulséɾa] - /pulseɾa/; [seɾßjéŋte] - [seɾpjeŋte]*	Se eliminan los contrastes de vocal de esta sección. *Vowel contrasts are eliminated from this section.*
Consonantes solas estridentes. (/f/ y /s/ en posición de ataque al inicio y en el interior de palabra). *Strident consonants alone. (/f/ and /s/ in word initial onset position and in the word interior).*	Se especifican las posiciones de los estridentes. *Position for stridents is specified.*
Deslizada palatal /j/ y deslizada labiovelar /w/. *Palatal glide /j/ and Labiovelar glide /w/.*	Se añade la deslizada labiovelar /w/. *Labiovelar glide /w/ is added.* Se eliminan las sibiliantes palatales. *Palatal sibilants are eliminated.*
Secuencias de consonantes en el interior de palabra (CC y CCC) /pweŋte/ - /kaŋdaðo/ - /sortiha/ - /balde/ - /koŋtreɾas/. *Consonant sequences in the word interior (CC and CCC)* */pweŋte/ - /kaŋdaðo/ - /sortiha/ - /balde/ - /koŋtreɾas/.*	Se especifica que son secuencias en el interior de palabra y que también pueden ser CC. *It is specified that these are sequences in the word interior and that it also could be a CC combination.* Se elimina el trabajo con consonantes en posición medial de palabra. *Work with consonants in the word medial position is eliminated.*
Asimilaciones. *Asimilations.*	Permanece igual. *Stays the same.*
PATRONES AVANZADOS POTENCIALES *Potential Advanced Patterns*	
Sinfones y secuencias de consonante en el interior de palabra. *Clusters and consonant sequences in the word interior.*	Se especifica que sean sinfones y secuencias de consonantes en el interior de palabra. *Clusters are specified and consonant sequences in the word interior.*
Multisilábicos. *Multisyllabics.*	Permanece igual. *Stays the same.*

The selected target, syllable arrangement, other segments inside the word, can increase or decrease the complexity of a phonetic context. At the same time this can make a target easier or more difficult for the child to produce correctly. Regarding phonetic contexts, Fleming (1971) & Kent (1982) in Lowe (1994) presented a series of aspects that should be considered in the selection the ideal targets: (a) *Stress*. Production of the target phoneme is facilitated when it is located within the stressed syllable; (b) *Word position*. Typically the target is facilitated if it is in the onset position, either word initial or word interior position; (c) *Nature of adjacent sounds*. If sounds adjacent to the target require distant movements of the articulators the complexity of the production is increased. Example: in Spanish /s/ is near the vowel /i/, not the /o/ regarding articulatory

movements and lip position; (d) *Quantity of error sounds inside the word*. Grouping error sounds inside the same word increases complexity. Example: for a child with problems with fricatives and liquids the Spanish word "zorro" [so-ro] *fox* is not a good target since it contain both fricative + trill /r/ liquid; (e) *Potential to facilitate the error pattern*. Using contexts that facilitate the error pattern without noticing, increases the complexity of the target. Example: for a child with stopping the Spanish target "sapo" [sa-po] *frog* could be a stimulus that facilitates the stopping pattern since it already contains a stop; and (f) *Syllable type and quantity*. A production is simpler if it contains less quantity of syllables and when syllables are open.

Gordon-Brannan & Weiss (2007) establish criteria used to determine which phoneme to target. This selection criteria will vary according to the treatment approach the clinician will be using: (1) early developing; (2) late developing (3) stimulable; (4) non-stimulable; (5) produced correctly in a key word; (6) frequently occurring; (7) visible; (8) consistently misarticulated; (9) one client or others desire to target; (10) one for which the client has been criticized or penalized; (11) omitted or has an atypical substitution; (12) least affected by physical limitations; (13) same phoneme for a group of clients.

CONCLUSION

Goldstein & Iglesias (2001) found that by taking the features of Puerto Rican Spanish into account during speech sample analysis, there was a decrease in the number of consonant errors, number of errors within individual sound classes, and percentage of occurrence for phonological processes, and an increase in PCC. Hispanics conforms over 16 percent of the total US population. Puerto Ricans, the second largest group, comprised 9% of the Hispanic population in 2010. ASHA 2004 document *Knowledge and Skills Needed by Speech-Language Pathologists and Audiologists to Provide Culturally and Linguistically Appropriate Services* states: "Only by providing culturally and linguistically appropriate services can we provide the quality of services our clients/patients deserve. Regardless of our personal culture, practice setting, or caseload demographics, we must strive for culturally and linguistically appropriate service delivery. For example, we must consider how communication disorders or differences might be manifested, identified, or described in our client's/patient's cultural and linguistic community. This will inform all aspects of our practice including our assessment procedures, diagnostic criteria, treatment plan, and treatment discharge decisions."

Literature available for the treatment of children with SSD is extensive. It is highly probable that more treatment approaches will be developed over the next years. Regardless of that Williams, McLeod & McCauley (2010) suggest that clinicians (1) find one well-developed intervention approach that has been devised for the clients you serve and the needs they have; (2) learn how to use the approach masterfully; and (3) Repeat steps one and two.

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CONSIDERATIONS FOR ACCENT MODIFICATION FOR RUSSIAN-TO-ENGLISH SPEAKERS

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ABSTRACT

This article presents the characteristics of the accent that the phonological rules of native Russian speakers impose upon English learned as a second language. This article further provides a description of the performance of these speakers on a descriptive procedure, the Fisher-Logemann Test of Articulation Competence, which was the earliest standardized test to consider dialectal traits in the interpretation of test results. This article then presents an example of an approach to teach an English phoneme that does not exist in Russian to a native Russian speaker as part of a broader accent modification program. Speech-language pathologists who provide accent modification services can adapt the evaluation and treatment procedures described in this article to a variety of other languages.

KEY WORDS

Dialect, Accent Modification,
Russian Phonology

Speech-language pathologists (SLPs) address not only communication delays and disorders, but also communication differences. For clients with communication differences, SLPs may provide various accent modification services to assist the clients who have learned English as a second language as they work toward enhancement of personal and/or professional communication skills. This article describes a process that SLPs can use to assess whether a client presents with a typical or an atypical pattern of accent, then further describes a process that SLPs can use to teach a phoneme that does exist in the English language but does not exist in the native language of the client. After they become familiar with these processes, SLPs can adapt these to other languages to enhance their clinical practice.

LANGUAGE SELECTED

For the purposes of this article, the author selected Russian. Over the years, the author has worked with a number of women from Russia and has always found the influence of Russian phonology on the production of American English to be of considerable interest, as well as quite beautiful. The focus of this article, therefore, is (1) to present how a native speaker of Russian would produce the American English (nonnative language) speech targets of the Fisher-Logemann Test of Articulation Competence (FLTAC) (1971) and (2) to develop a protocol to assist clinicians in determining stimulability for a specific non-native phoneme.

Developed by Hilda Fisher and Jeri Logemann (1971), the FLTAC can be used as a screening or an evaluation Tool. The test employs a distinctive feature analysis of articulatory "errors." However, this test does not automatically presume that differences in productions constitute “errors.” Rather, the authors present descriptions of regional dialects within the English language and considers such productions as language differences. The test provides a word list to examine all speech segments - consonants, consonant clusters, and vowels of American English - and also provides 15 sentences to assess effects of coarticulation, as well as the suprasegmental features.

Variations in phonology are referred to as *accents* and are heard as differences in both articulation and prosody (or segmental and suprasegmental elements) (Shriberg & Kent, 2003). When working with clients in an accent modification program, the SLP must be knowledgeable as to how the phonological rules governing the native language compete with and impose upon the production of American English, thus contributing to the foreign accent. The differences between the phonemic repertoires of a speaker's native language and the target language dictate which sounds will be produced in a foreign accent.

CLINICAL PREPARATION FOR ACCENT MODIFICATION SERVICES

Learning the Phonological Influences

In order to assess how a native speaker of Russian would articulate the English words on the FLTAC, the SLP should understand the phonetic inventories of each language. This is important in order to assess language/phonological difference versus language/phonological disorder. *Communication difference,* also known as *dialect/accent*, is a variation of a symbol system used by a group of individuals that reflects and is determined by shared regional, social, or cultural/ethnic factors. A regional, social, or cultural/ethnic variation of a symbol system should not be considered a disorder of speech or language (ASHA, 1993).

Determining the Clinical Priorities

Prior to assessment and/or treatment, the SLP should conduct a clinical interview with the client and/or any caregivers to determine the wants and needs of the client with regard to his or her presenting concerns (Flynn, 1978). *Evidence-based practice* (EBP) refers to an approach in which current, high-quality research evidence is integrated with practitioner expertise and client preferences and values into the process of making clinical decisions (ASHA, 2005). An essential component of EBP, client preferences and values, can be initially obtained during the clinical interview in order to ascertain the concerns and can assist the SLP with the determination of the goals of assessment and/or therapy. Accent modification is an elective service, and it is vital to have an understanding of the expectations of the client with respect to the therapeutic process.

Learning the Language-Specific Phonology

The phonetic inventory of Russian consists of 20 consonant sounds, 17 of which are found in English. The three consonants found in Russian and not in English are: (a) */X/,* classified as a velar fricative, with a slightly rough, guttural sound and a production similar to a /kh/, (b) combination /*Ir/,* classified as an alveolar trill, produced with a sound made with a supraglottal vibration requiring a flow of air directed between two articulators that are held together with just enough muscle tension to produce vibration, and (c) /*Its/,* classified as an alveolar affricate that resembles a slightly palatalized form of /*t/.* The phonetic inventory of Russian consonants is presented in Figure 1.

In Figure 2, the 24 consonants listed all occur in English. The six consonants in the unshaded blocks occur in English but do not occur in Russian. Table 1 presents what consonant substitutions a native speaker of Russian may use when attempting to produce target English words containing consonants that do not occur in Russian. Example words from the FLTAC are used to illustrate the differences.

Monk and Burak (2001) provide some additional information about differences the SLP may hear when evaluating a native speaker of Russian:

CONSONANTS (PULMONIC)

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b		t d					k g			ʔ
Nasal	m		n								
Trill			r								
Tap or Flap											
Fricative		f v		s z	ʃ ʒ			x			h
Affricate				ts	tʃ						
Lateral fricative											
Approximant							j				
Lateral approximant				l							

Where symbols appear in pairs, the one to the right represents a voiced consonant. Shaded areas denote articulations judged impossible.

FIGURE 1. The consonant phonemes of the Russian language. Chart used courtesy of the Speech Accent Archive (1999), located at http://accent.gmu.edu.

p	b	f	v	θ	ð	t	d
s	z	ʃ	ʒ	tʃ	dʒ	k	g
m	n	ŋ	l	r	j	w	h

FIGURE 2. Comparison of the consonant phonemes of the Russian language with those of the English language. The phonemes in the unshaded boxes do not occur in Russian.

• The /r/ in Russian is trilled (indicated with a check mark under the */r/* in the IPA transcriptions provided for the FLTAC).
• The sounds /t*/, /d/,* and /*v/* are often made with the tongue touching the top teeth, which gives them a foreign sound.
• Final voiced consonants such as /*b/, /d/,* and */g/* are devoiced in Russian, causing learners to pronounce such words as "lab" like "lap," "said" like "set," and "pig" like "pick."

•The sounds /p/, /t/, and /k/ are not aspirated in Russian, which causes learners to misarticulate them at the beginnings of words in English. Examples include the production of "pit" like "bit," "come" like "gum," and "tart" like "dart."
• Russian learners may palatalize most English consonants before front vowels. Thus, the /t/ in "tea" may sound like /ts/. The /d/ in "deed" may sound like /dz/. The /k/ in "kay" may have a slight sound of /j/ following the /k/.
• /tʃ/ is always slightly palatalized in Russian, so learners tend to replace the more forceful English version with a less forceful version.
• The Russian counterpart of the English /i/ is articulated with more amplitude.
• "Dark" phonemes tends to replace "clear" phonemes. The consonant /ʃ/ is always "dark" in Russian, so speakers tend to produce the phoneme more forcefully (or "darker") when in word final position.

The authors also note some special consideration with consonant clusters:

Learners ignore the phonetic phenomenon of accommodation/assimilation of adjacent consonants in productions of /t/, /d/, /s/, and /z/ when followed by /i/.

English Consonants not occurring in Russian	Substitutions
/θ/	/s/ or /t/ -- sʌm or tʌm for θʌm
/ð/	/z/ or /d/ -- zis or dis for ðɪs
/ŋ/	/g/ or /n/ -- wɪg or wɪn for wɪŋ
/dʒ/	/ʒ/ -- ʒʌmp for dʒʌmp
/w/	/v/ -- vɛst for wɛst
h	χ -- χand for hænd

TABLE 1. Description of substitutions characteristic of Russian-influenced English consonant productions.

• Initial clusters of /pr/, /br/, /tw/, /tr/, and /dr/ tend to have the component sounds articulated separately, with insertion of a neutral vowel between the sounds (and also because the /r/ is trilled).

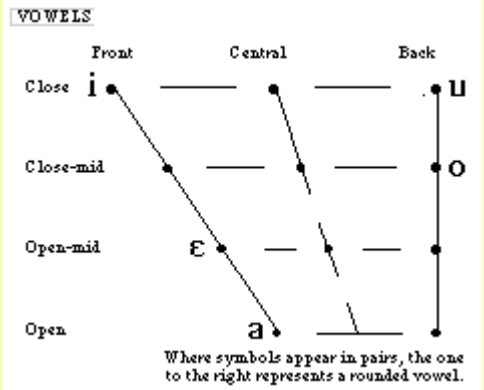

FIGURE 3. The vowel phonemes of the Russian language. Chart used courtesy of the Speech Accent Archive (1999), located at http://accent.gmu.edu.

Figure 3 presents the Russian vowel system - five pure vowels. Dauer (1993) notes that, in pure vowels, the quality of the monophthong vowel stays about the same from the beginning to the end. In diphthongs, the quality of the vowel changes from beginning to end in that it starts as sounding like one vowel but then transitions into sounding like another. When the SLP compares the Russian vowel system with that of English, he or she can easily see the differences inherent between the two languages. Monk and Burak (2001) note that the two major features that distinguish the Russian sound system from the English vowel system are (1) the absence of the short-long vowel differentiation and (2) the absence of diphthongs. They describe some of the vowel differences between English and Russian and some substitutions that native Russian speakers may make when speaking English due to the fact that Russian does not have as rich a vowel inventory as does English.

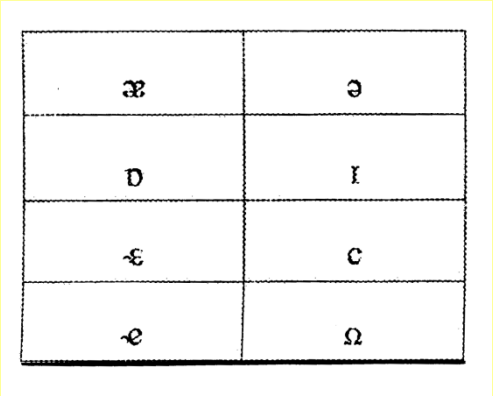

TABLE 2. The vowel phonemes of the English language not contained within the Russian language.

English Vowels not occurring in Russian	Substitutions
/ɝ/ and /ɚ/ The vowel /ɝ/ (and unstressed / ɚ/) often cause Russian learners of English the most difficulty, especially in the context of a word with /w/ in initial position (i.e. worm, worth, worse).	**/o/ or /ɛ/** -- gjɛl for gɝl
/æ/	**/ɛ/** -- lɛdɛ for lædɚ
/ɑ/	**/a/** -- fadɛ for fɑðɚ
/ɔ/	**/o/** -- dog for dɔg
/ʊ/	**/u/** -- buk for bʊk
/ɪ/	**/i/** -- sizɛrz for sɪzɚz
/e/	**/ɛ/** -- plɛn for plen

TABLE 2. Description of substitutions characteristic of Russian-influenced English vowel productions.

Monk and Burak (2001) note a few additional aspects of vowel differences:

• Sometimes,"long" (or tensed) vowels are articulated insufficiently tense, making them sound similar to "short" (or lax) vowels.
• Russian speakers tend to articulate most English vowels as glides, which appears to be due to the difficulty Russians have differentiating in their pronunciation between long (tense) and short (lax) English sounds.
• Russian speakers tend to articulate most English vowels as glides, which appears to be due to the difficulty Russians have differentiating in their pronunciation between long (tense) and short (lax) English sounds.
• The beginnings of tense sounds tend to be articulated in a relaxed way with tenseness starting to appear toward the middle of the articulation; short sounds tend to be diphthongized due to their slight lengthening.

ADAPTATION OF THE FISHER-LOGEMANN TEST OF ARTICULATION COMPETENCE

FLTAC: Word Portion

The section that follows details an attempt to modify the word portion of the FLTAC for a SLP who is assessing a native speaker of Russian (and thus a non-native speaker of English) for the purposes of accent modification. Using the footnote system of Fisher and Logemann in their work on identifying dialectical differences, the SLP can judge the English productions of the speaker within the context of the phonetic rules of Russian. Figure 4 provides the consonant inventory for the word portion of the FLTAC, while Figure 5 provides the consonant blends and vowels of the target test words. Following that are IPA transcriptions of *attempted* productions (what the clinician would expect to hear from the point of view of Standard American English dialect) and also IPA transcriptions of *produced* productions (what the SLP may expect to hear from a client presenting with a standard Russian dialect) (Figure 6, Figure 7, Figure 8, and Figure 9).

FLTAC: Sentence Portion

Based on the patterns of Russian-influenced English provided in the description of the adaptation of the FLTAC words, the SLP can also adapt the FLTAC sentences. Again using the footnote system of Fisher and Logemann, the SLP can judge the English productions of the speaker within the context of the phonetic rules of Russian. And although slightly beyond the scope of this article, the SLP can obtain data pertaining to the suprasegmental features of speech. Among the suprasegmentals are stress, intonation, loudness, pitch level, juncture, and speech rate (Bernthal, Bankson & Flipsen, 2009). Figure 10 provides the sentences and target phonemes of the sentence portion of the FLTAC. After the SLP reviews these, he or she can construct the IPA transcriptions of *attempted* productions (what the clinician would expect to hear from the point of view of

IPA Phoneme	Common Spelling	Place of Articulation	Voicing	Manner of Formation: Stop Pre	Stop Inter	Stop Post	Fricative Pre	Fricative Inter	Fricative Post	Affricate Pre	Affricate Inter	Affricate Post	Glide Pre	Glide Inter	Glide Post	Lateral Pre	Lateral Inter	Lateral Post	Nasal Pre	Nasal Inter	Nasal Post
p b ʍ w m	p b wh w m	Bilabial	Ⱦ	p[1]	p	p	ʍ[9]														
			V	b	b	b[2]							w[9]	w[9]					m	m	m
f v	f v	Labio-dental	Ⱦ				f	f	f												
			V				v	v	v												
θ ð	th th	Lingua-dental	Ⱦ				θ[5]	θ[5]	θ[5]												
			V				ð[6]	ð[6]	ð[6]												
t d l n s z	t d l n s z	Lingua-alveolar	Ⱦ	t[1,3]	t[3]	t[3]															
			V	d[3]	d[3]	d[2,3]										l[3]	l[3]	l[3]	n	n	n
			Ⱦ				s	s	s												
			V				z	z	z												
ʃ ʒ tʃ dʒ	sh zh ch j	Blade-prepalatal	Ⱦ				ʃ[11]	ʃ[11]	ʃ[11]	tʃ[11]	tʃ[11]	tʃ[11]									
			V					ʒ	ʒ	dʒ[10]	dʒ[10]	dʒ[10]									
j	y	Front-palatal	Ⱦ																		
			V										j	j							
r	r	Central-palatal	Ⱦ																		
			V										r[4]	r[4]	r[4]						
k g ŋ	k g ng	Velar	Ⱦ	k[1]	k	k															
			V	g	g	g[2]														ŋ[7]	ŋ[7]
h	h	Glottal	Ⱦ																		
			Ⱦ				h[8]	h[8]													

Dialectical Variations: *Russian*

1. May be unaspirated -- /p/, /t/, /k/ (pre)
2. May be devoiced -- /b/, /d/, /g/ (post)
3. May be dentalized -- /t/, /d/, /l/
4. May be trilled -- /r/
5. /θ/: May substitute /s/ or /t/
6. /ð/: May substitute /z/ or /d/
7. /ŋ/: May substitute /g/ or /n/
8. /h/: May substitute /χ/
9. /w/: May substitute /v/
10. /dʒ/: May substitute /ʒ/
11. May be darkened -- /ʃ/, /tʃ/

FIGURE 4. Adaptation of the FLTAC for Russian-influenced English. Chart used courtesy of the publisher.

Consonant Blends

/s/ + consonant	consonant + /r/ [1,2]	consonant + /l/ [2]
_____/s spoon	_____/r present	_____/l sled
_____/s star	_____/r bread	_____/l blue
_____/s slide	_____/r fruit	_____/l plane
_____/s snake	_____/r frying pan	_____/l flag
_____/s skate	_____/r three	_____/l clown
_____/s swing	_____/r tree	_____/l glass
_____/s smoke	_____/r dress	_____/l bottle
	_____/r cry	
	_____/r green	

Dialectical Variations: *Russian*

1. /r/ may be trilled
2. /ə/ may be inserted between blended consonants

Vowel Phonemes

	Front	Central	Back
High	_____/i key _____/ɪ [1] mitten		_____/u two _____/ʊ [4] foot
Mid	_____/e [2] table _____/ɛ bell	_____/ɚ [3] shirt _____/ʌ cup	_____/o phone
Low	_____/æ [2] hat		_____/ɔ [5] ball _____/ɑ [6] sock

Phonemic Diphthongs:

_____/aɪ [7] eye

_____/aʊ [7] house

_____/ɔɪ [7] boy

Dialectical Variations: *Russian*

1. /ɪ/: May substitute /i/
2. /e/ & /æ/: May substitute /ɛ/
3. /ɚ/: May substitute /o/ or /ɛ/
4. /ʊ/: May substitute /u/
5. /ɔ/: May substitute /o/ or /u/
6. /ɑ/: May substitute /a/
7. May be reduced to pure vowels

FIGURE 5. Adaptation of the FLTAC for Russian-influenced English. Chart used courtesy of the publisher.

FLTAC Word Consonants	Attempted	Produced
Pen	pɛn	pʰɛn
Box	baks	baks
Whistle	wɪsəl	vɪstəl
Water	wɔtɚ	wuteɾ
Man	mæn	mɛn
Finger	fɪŋgɚ	fingeɾ
Vest	vest	vest
Thumb	θʌm	tʌm
This/That	ðɪs/ðæt	dɪs/dat
Top	tap	tap
Dog	dɔg	dɔg
Leaf	lif	lif
Nose	noʊz	noz
Seal	sil	sil
Zebra	zibrə	zibɾə
Shoe	ʃu	ʃu
Measuring cup	mɛʒɚɪŋ kʌp	mɛzuʃing kʌp
Chair	tʃɛɚ	ʃeɾ
Jump	dʒʌmp	ʒʌmp
Yellow	jɛloʊ	jɛlo
Rain	reɪn	ɾen
Coat	koʊt	kot
Girl	gɝl	gɝl
Hanger	hæŋɚ	xangeɾ
Hand	hænd	xand
Newspaper	nuzpeɪpɚ	njuzpʰepeɾ
Baby	beɪbi	bebi
Wheel	wil	vil
Flower	flaʊɚ	flaveɾ
Hammer	hæmɚ	xemɛ
Elephant	ɛləfənt	ɛlafənt
Television	tɛləvɪʒən	tɛlaviʒən
Toothache	tuθeɪk	tutak
Feather	fɛðɚ	fedɛɾ
Letter	lɛɾɚ	lɛtɛɾ

FIGURE 6. Attempted versions and produced versions of FLTAC words by a speaker of Russian-influenced English.

FLTAC Word Consonants	Attempted	Produced
Ladder	læɪɚ	ledeɾ
Balloon	bəlun	bəlun
Penny	pɛni	pʰeni
Glasses	glæsɪz	gəlasiz
Scissors	sɪzɚz	sizoɾz
Dishes	dɪʃɪz	diʃəz
Garage	gəradʒ	gəɾeʒ
Matches	mætʃɪz	mat̚ʃiz
Pages	peɪdʒɪz	pʰɛʒɛz
Yoyo	joʊ joʊ	jo jo
Carrot	kæɾət	kaɾɛt
Rocket	rakɪt	ɾakit
Wagon	wæɡən	vaɡun
Ring	rɪŋ	ɾing
Behind	bihaɪnd	bizɛnd
Soap	soʊp	sop
Bib	bɪb	bib
Drum	drʌm	dɾʌm
Knife	naɪf	naf
Five	faɪf	fav
Teeth	tiθ	tit
Smooth	smuð	smud
Boat	boʊt	bot
Bed	bɛd	bed
Tail	teɪl	tel
Pen	pɛn	pʰen
Bus	bʌs	bas
Toes	toʊz	toz
Brush	brʌʃ	bɾʌʃ
Watch	watʃ	vat̚ʃ
Cage	keɪdʒ	kɛʒ
Car	kaɚ	kaɾ
Book	bʊk	buk
Egg	ɛɡ	ɛg

FIGURE 7. Attempted versions and produced versions of FLTAC words by a speaker of Russian-influenced English.

FLTAC Word Consonant Clusters	Attempted	Produced
Spoon	spun	spun
Skate	skēit	skiet
Present	prezənt	pɛzənt
Tree	tri	tɕi
Sled	sled	sled
Clown	klaʊn	klaʊn
Star	staər	stɛɛ
Swing	swɪŋ	swin
Bread	bred	bɛɛd
Dress	dres	dɛɛs
Blue	blu	blu
Glass	glæes	glɛɛs
Snake	snēik	snak
Smoke	smōōk	smak
Fruit	frut	fɛut
Crying	kraɪŋ	kɛaɪng
Flag	flæg	flag
Bottle	bart	batəl
Slide	slāid	slaid
Frying pan	fraɪŋ pæn	fɛaɪng pɛn
Green	grin	gɛint
Plane	plēin	pɛlen
Three	θri	tɕi

FIGURE 8. Attempted versions and produced versions of FLTAC words by a speaker of Russian-influenced English.

Standard American English dialect) and also IPA transcriptions of *produced* productions (what the clinician may expect to hear from a client presenting with a standard Russian dialect).

PHONEME STIMULABILITY

This section focuses on developing a protocol to determine whether a speaker of English influenced by Russian is stimulable for production of an English phoneme that does not occur in Russian. Bernthal et al. (2009) describe stimulability testing as sampling the ability to repeat the correct form (adult standard) of the error sounds when provided with "stimulation." Generally, the process consists of the SLP's asking the client to imitate an auditory and/or visual model of a sound in one or more phonetic contexts (i.e. isolation, syllables, initial word position, etc.). A typical way of cueing the client is for the SLP to instruct him or her to "watch and listen to what I am going to say, and then you say it."

Knowing where to begin in a program of accent modification could possibly be a daunting task for a new clinician, especially when the phonology of the client's native language is quite far removed from English and strongly imposes on English productions.

FLTAC Word Vowels	Attempted	Produced
Key	ki	kji
Hat	hæt	xat
Ball	bɔl	bal
Eye	āɪ	aɪ
Mitten	mɪtən	mitən
Sock	sak	sak
Phone	foʊn	fon
House	haʊs	xas
Table	teɪbl	tebəl
Cup	kʌp	kʌp
Foot	fut	fot
Boy	bōɪ	boɪ
Bell	bɛl	bɛl
Shirt	ʃɜt	ʃɛɕt
Two	tu	tu
You	iu	iu

FIGURE 9. Attempted versions and produced versions of FLTAC words by a speaker of Russian-influenced English.

The research on stimulability comes primarily from reports of treatment with children who have articulation and/or phonological disorders or delays. In a traditional approach to treatment target selection, sounds that are stimulable are chosen first because they are easier for the client to learn (Hodson & Paden, 1991). Rvachew (2005) also supports giving stimulable sounds priority and argues for the importance of phoneme perception training in tandem with phonetic placement procedures for improving stimulability. In contrast, there is also research to support the selection of sounds that are not stimulable, arguing that non-stimulable sounds are more complex and should be given priority over stimulable sounds to facilitate generalization to both stimulable and non-stimulable sounds (Powell et al. 1991; Miccio et al.1999).

As discussed earlier, the portion of EBP addressing the client's wants and needs can be an essential component of the process. The client may come to the clinician with an understanding of his or her own accent or may even share specific feedback he or she has received from communication partners. In some cases, it may be best to start with a phoneme that the clinician would expect to have a high degree of stimulability. In other cases, it may be necessary to begin with the phoneme that is causing the greatest obstacle with the client's intelligibility and thus may be the most difficult sound to elicit.

The Fisher-Logemann Test of Articulation Competence
Sentence Articulation Test

	p[1] b[2] p b b p
/p, b/	1. Pete's job was to keep the baby happy.
	t[1] d d t[1] d[2] t t
/t, d/	2. Today Dick told Patty about it.
	g[3] k g k g[2]
/k, g/	3. The girls were baking the biggest cake for Mr. Tag.
	ð[5] ð[5] ð[5] θ[4] θ[4] θ[4]
/θ, ð/	4. Their brother wouldn't bathe because he thought a bath would make his toothache worse.
	f f v v f v v
/f, v/	5. In half a day, he repaired five television sets, two telephones, and a very old stove.
	s z s z s z s
/s, z/	6. Suzie sewed zippers on two new dresses at Bessie's house.
	ʃ[6] ʒ ʃ[6] ʃ[6] ʒ
/ʃ, ʒ/	7. She usually rushes to push the garage door closed.
	dʒ[7] dʒ[7] tʃ[6] tʃ[6] tʃ[6]
/tʃ, dʒ /	8. George is at the church watching a magic show.
	w[9] r[8] l r[8] l w[9] l r[8]
/r, l, w/	9. We rode with Lucy around the tall tower in her new yellow car.
	ʌ[9] h[10] ʌ[9] h[10] h[10] j h[10] j
/ʌ, j, h/	10. Why haven't you looked anywhere behind the house or beyond the hill yet?
	n n m n ŋ[11] ŋ[11] m n
/m, n, ŋ/	11. Nancy found some fine hangers among the many things at the sale.
	ɛ i i ɪ[12] ɪ[12] ɛ e[13] e[13]
/i, ɪ, e, ɛ/	12. Let me keep a little of this wedding cake to eat later.
	ɑ[14] ɚ[15] æ[13] ə ə ɑ[14] æ[13] ɚ[15]
/æ, ɑ, ə, ɚ/	13. Father asked how much money Tom had saved to buy a bird cage.
	u ɔ[16] o ɔ[16] ʊ[17] u ɔ[16] ʊ[17] o
/ɔ, o, ʊ, u/	14. Ruth caught a cold because she wouldn't wear her new warm wool coat.
[18]	aɪ aʊ ju ɔɪ ju aʊ ɔɪ aʊ
/aɪ, aʊ, ɔɪ, ju/	15. I found a huge toy music box outside Roy's house.

Dialectical Variations: *Russian*

1. May be unaspirated -- /p/, /t/, /k/ (pre)
2. May be devoiced -- /b/, /d/, /g/ (post)
3. May insert /j/ after consonant -- /k/, /g/
4. /θ/: May substitute /s/ or /t/
5. /ð/: May substitute /z/ or /d/
6. May be darkened -- /ʃ/, /tʃ/
7. /dʒ/: May substitute /ʒ/
8. May be trilled -- /r/
9. /w, ʌ /: May substitute /v/
10. /h/: May substitute /χ/
11. /ŋ/: May substitute /g/ or /n/
12. /i/: May substitute /ĭ/
13. /e/, /æ/: May substitute /ɛ/
14. /ɑ/: May substitute /a/
15. /ɚ/: May substitute /o/ or /ɛ/
16. /ɔ/: May substitute /o/ or /u/
17. /ʊ/: May substitute /u/
18. May be reduced to pure vowels

FIGURE 10. Adaptation of the FLTAC for Russian-influenced English. Chart used courtesy of the publisher.

Whatever the decision, it is always vital to consider the client's wants and needs in the decision-making process. Jenkins (1998) also notes a shift in the thinking about English as a *second* language or *foreign* language to the notion of *English as an International Language* (ElL). Thus, clients seeking accent modification may not always be looking to correct all sound "errors" but rather may seek therapeutic services from the point of view of this framework, looking only to improve that which makes them most unintelligible from an ElL context: "We no longer regard English as being taught mainly for communication with its native speakers (the goal of EFL), or the target of pronunciation teaching as a native-like accent, with the eradication of all traces of a 'foreign' accent, however unrealistic that target always was. We acknowledge that the EFL-ESL distinction is beginning to blur as the two merge into English as an International Language (ElL). Nowadays English most frequently serves as a worldwide lingua franca for its vast numbers of non-native users, and as Widdowson (1994) so forcefully argues, it is no longer the property of its native speakers (p. 119)."

For the purposes of this article, the author has chosen to develop a stimulability protocol for the phoneme /æ/. The crucial difference between a non-native speaker of English and a native speaker (or fluent bilingual) with regards to segmentals is that the non-native may deviate from native models in precisely those sounds that are considered to be "core" sounds of English, and vowels are considered to be core sounds that could significantly alter meaning (Jenkins, 1998). Intelligibility can certainly be affected by consonant sound substitutions, but often vowels can be the most problematic, and considering the difference between the Russian and English vowel inventories, a client may need the most remediation with vowel sounds.

STIMULABILITY PROTOCOL

Step 1: *Evaluate the client's specific auditory perceptual skills.*
Bauman-Waengler (2012) notes that the term *specific perceptual skills* refers to the client's ability to differentiate between his error production and the target sound. Van Riper and Emerick (1984) developed a protocol for sensory-perceptual training in which the client is not yet asked to attempt a production of the target sound but is asked only to judge its distinctness from other sounds. While this type of ear training may not be necessary for a client (and is not typically implemented by most clinicians), Bauman-Waengler (2012) cautions that it is important to remember that each client must develop specific perceptual abilities in the form of self-monitoring skills, and clinicians will constantly need to help clients develop discrimination of "correct" versus "incorrect" productions.

For a client seeking accent modification services, this training could possibly be the first step in the progression of therapy. Wolfe et al. (2003) looked at the effects of sound identification training and found that, for sounds that were not well identified, significantly greater improvement occurred when sound identification training was added to the treatment regimen, and Hodson and Paden (1991) recommended that auditory stimulation be incorporated into every clinical session as part of their cycles approach. However, the efficacy of the approach has been debated in the research, with some advocating for production training only (Locke, 1971; Smit & Bemthal, 1983).

Van Riper and Emerick's (1984) training involves a four-step process of identification, isolation, stimulation, and discrimination.

Step 2: *Initiate auditory stimulation/imitation.*
In this process, the clinician provides examples of the target sound /æ/ in isolation and asks the client to imitate the sound - the "watch me and do exactly what I do" standard of stimulability testing. Bauman-Waengler (2012) notes that, if this works, it is the easiest and quickest way to achieve the target sounds, but it does not always succeed. She also advises that *facilitating contexts* may be used at first, rather than necessarily beginning with an isolated production. Facilitating contexts (or key words) are sometimes found in the analysis of the client's assessment, and Van Riper (1978) describes how these key words can be used to move directly to the production of the target sound in isolation. If the client does not necessarily have accurate productions noted from the evaluation, the clinician can try to present the sound in the context of a syllable or a word; some clients can produce the target sound quite accurately in some word contexts but not in others. The SLP should probe to determine the client's ability. If the client is unable to imitate the SLP's sound production, the clinician should proceed to Step 3.

Step 3: *Implement phonetic placement activities.*
In the phonetic placement method, the clinician instructs the client how to position the articulators in order to produce a typical production of the target sound. The clinician must know the production features of the sound and carefully analyze the client's error production to determine which articulatory changes are necessarily to facilitate accurate production. /æ/ is considered a low/front/lax/unrounded vowel. Secord et al. (2007) note that the front part of the tongue is raised slightly toward the palate, the jaw is open relatively wide, and the lips are not rounded. Generally, the tongue does not touch the upper teeth during the production of this particular vowel. Secord et al. (2007) provide moto-kinesthetic techniques to help the client reach the correct articulatory placement and thus achieve the correct sound production. For such tasks, gloves should be worn, and a tongue depressor may be used to help facilitate placement. The clinician should also encourage the client to use a mirror and possibly a flashlight to see what's happening with the oral cavity.

From an outside stimulation, the jaw is lowered slightly more. The SLP holds the upper lip with his or her thumb and forefinger of one hand. The SLP then places the thumb and

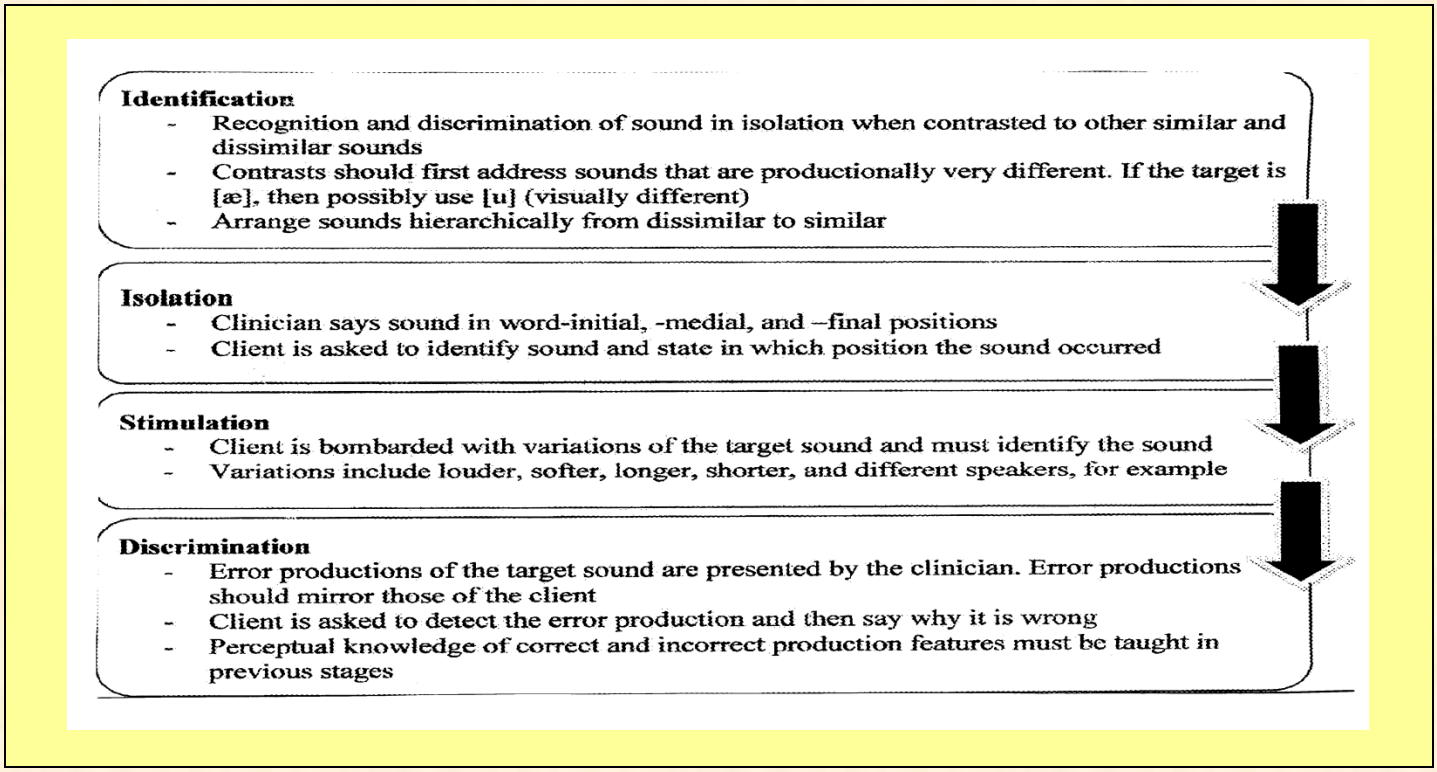

FIGURE 11. Description of a four-step process to increase the likelihood of correct production of a phoneme.

forefinger of the other hand at equal distances from the midline of the lower lip and exerts pressure against the jaw outward from the midline. The SLP also stimulates inside by placing the flat surface of a tongue depressor on the edges of the lower teeth, about three-quarters of an inch from the end of the depressor. The surface of the tongue depressor inside the mouth serves to shape the tongue like an inclined plane, sloping toward the tip.

Due to time (and oftentimes financial) constraints in therapy, technology can be a key factor in assisting a client with phonetic placement. Two sources in particular can be beneficial for the client to use at home or on-the-go: (a) the University of Iowa's *fonetrks* website (http://www.uiowa.edu/~acadtech/phonetics/#) and (b) the Speech Trainer 3D iPad application (http://itunes.apple.comlus/app/speech-trainer). Both of these sources provide sagittal, three-dimensional views of the production of /æ/ as well as frontal views of speakers. Animations are included with step-by-step instructions for articulatory placement. These tools are useful for clients who need a great deal of assistance outside of therapy and for those who are looking for ways to practice on their own.

Step 4: *Implement sound modification/approximation method.*
This method is based on deriving the target sound from a phonetically similar sound that the client can accurately produce. This sound is used as a starting point to achieve the target production. Specific adjustments to the articulators are suggested and can be implemented by the clinician if necessary using the moto-kinesthetic techniques described above (Secord et aI, 2007).

Step 5: *Maintain productional accuracy of the target sound in a hierarchy.*
Once the target sound has been reached, the SLP can then work with the client to accurately produce /æ/ in syllables, words, phrases, sentences, and spontaneous speech. Bauman-Waengler (2012) notes that the word level contains a wide variety from one-syllable CV structures to multisyllabic words in which the target sound may appear several times. Typically, the fewer number of syllables, the easier the word is to produce; thus one-syllable words should be attempted before two- and three-syllable words. Also, Secord (1989) notes that a sound in the initial position of a word or syllable appears to be easier to produce (i.e. apple rather than ladder). Negative practice - contrasting between the correct sound and the incorrect sound when prompted - can be beneficial for the client's self-monitoring of the sound production, and the clinician may use minimal pairs (i.e. sat-set) to help the client with vowel differences that can change the meanings of words.

CONCLUSION

As noted previously, a SLP can use this particular process to adapt the FLTAC for the evaluation of clients who present with a variety of dialects, as well as to subsequently stimulate the

English language phonemes not present in the native language of the client.

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